

**ANALYSIS OF AGRICULTURAL CREDIT IN DEVELOPMENT
PROJECTS: A CASE STUDY OF THE SOUTHERN HIGHLANDS
PROJECT IN TANZANIA**

BY

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ABSTRACT

This study is an evaluation of the role of the Southern Highlands Extension and Rural Financial Services Project (SHERFSP) in extending credit to smallholder farmers in Southern Tanzania. It also assesses the impact of such credit on agricultural production of smallholder farmers in the period 1995/96 to 1997/98. Data for the study were collected from a sample of 120 smallholder farmers from twelve villages in Iringa rural and Mufindi districts in Iringa region. Secondary data were collected from SHERFSP to assess its performance.

Results of the study reveal that SHERFSP uses a group lending approach to extend credit to smallholder farmers. Farmer's socio-economic factors that influence acquisition of credit from the SHERFSP are average cash from crop sales, average cost from hired labour, expenditure on inputs, average cash from off-farm activities and farmers' awareness about existence of SHERFSP.

An assessment of the impact of credit was made by comparing users and non-users of SHERFSP credit. Results show that there is a significant difference in farm input use, farm outputs and farm income levels between borrowers and non-borrowers. This implies that the acquisition of credit from SHERFSP had an impact on farmers. Those who obtained credit used higher levels of inputs, had higher farm output and farm income. Major problems encountered by smallholder farmers in procuring and use of credit are delays in the delivery of inputs, inadequate amounts of the loans received, poor supervision and


follow-up by SHERFSP staff, and a high interest rate charged by SHERFSP. Other problems are insufficient of markets for crop produce and inadequate farmer training in credit management and input use. In addition, the loan procurement procedure was observed to be cumbersome because of bureaucracy. Farmers are also restrained from doing other farm operations because loans issued were for farm inputs only.

The performance of SHERFSP has been affected by inadequate resources and a non-conducive implementation environment. Such problems are irregular and inadequate availability of funds, inadequate transport facilities and poor infrastructure. Non-repayment of loans from borrowers and inadequate extension services are also major problems.

The recommendations from the study focus on the improvement of the SHERFSP lending operations and procedures aiming at improving the effectiveness and efficiency of the SHERFSP in extending credit. The key recommendations are: (1) the present SHERFSP's lending procedures should be simplified to enable timely supply of inputs to farmers, (2) SHERFSP ought to emphasise more on farmer training in aspects concerning credit management and the use of inputs, (3) SHERFSP should foster to assist farmers in finding markets for their produce, (4) there should be a close supervision of credit recipients, this is important because it ensures proper use of inputs, and (5) SHERFSP ought to design a more effective follow-up method, incentives and penalties which would influence borrowers to repay their loans promptly.

DECLARATION

I, Mwallu Sikauka Mwachang'a, do hereby declare to the Senate of the Sokoine University of Agriculture that this dissertation is my own original work and has never been submitted nor concurrently being submitted for a degree at any other university.

Signed:  _____

Date: 08/03/2000

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DEDICATION

This work is dedicated to my father, Sikauka Mwachang'a and to my mother, Emelia Sempogole.

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LIST OF ABBREVIATIONS

ADT	Animal Drawn Technology
APC	Assistant Project Coordinator
CMO	Credit Management Officer
CMS	Credit Management Section
CO	Credit Officer
CRDB	Cooperative and Rural Development Bank
DALDO	District Agriculture and Livestock development Officer
DC	District Commissioner
DCDO	District Community Development Officer
DPC	Deputy Project Coordinator
DSACO	District Savings and Credit Officer
ECLO	Extension and Credit Liaison officer
FAO	Food and Agriculture Organization
FC	Financial Controller
GDP	Gross Domestic Product
IDA	International Development Agency
IFAD	International Fund for Agricultural Development
LAO	Loan Accounting Officer
LICs	Low Income Countries
MAC	Ministry of Agriculture and Cooperatives
MCDWC	Ministry of Community Development, Women and Children
MELO	Monitoring and Evaluation Liaison Officer

NALERP	National Agriculture and Livestock Extension Rehabilitation Project
NGOs	Non-Governmental Organizations
PC	Project Coordinator
PCU	Project Coordinating Unit
PEC	Project Executive Committee
PSC	Project Steering Committee
RALDO	Regional Agriculture and Livestock Development Officer
RAS	Regional Administrative Secretary
RCDO	Regional Community Development Officer
RCO	Regional Cooperative Officer
RMEO	Regional Monitoring and Evaluation Officer
SACCOS	Savings and Credit Cooperative Societies
SACO	Savings and Credit Officer
SACU	Savings and Credit Unit
SHERFSP	Southern Highlands Extension and Rural Financial Services Project
Tshs	Tanzanian shillings

CHAPTER ONE

1.0 INTRODUCTION

1.1 Rural finance

Rural finance has continuously been an important theme in the debate about agriculture and rural development. Credit has been considered necessary for small scale farmers with little capital of their own as a means to get access to improved agricultural technology and increase their productivity. In a number of agriculture dependent, low income countries (LICs), external financing to smallholder agriculture has been seen as one of the major means of bringing about agricultural transformation.

Policy makers and farmers have often identified lack of access to formal credit as a great impediment to agricultural production in developing countries (Kolajo, 1993). Schultz (1964) as cited by Kolajo (1993) argued from the point of view of existing traditional systems that, peasant farmers are efficient but poor, and hence they will lose strength in production if left financially unassisted. As a way of assisting farmers, the government of Tanzania has established credit schemes to provide financial resources to the agricultural sector through projects and various Non-governmental Organisations (NGOs). Formal credit has been viewed as a means to provide farmers with opportunities for growth by enabling them to procure farm inputs and fixed capital items required for them to operate at a better production level of technology.

1.1.1 Rural credit and Agriculture

Agricultural credit is emphasised because of the importance of the agriculture sector in the Tanzanian economy. Agriculture contributes about 60% of the Gross Domestic Product (GDP) in the country. It also contributes 60% of the national export earnings and employs over 80% of the Tanzanian population (World Bank, 1996; Mlambiti, 1997). It is estimated that small farmers produce more than 75% of agricultural production in the country under labour intensive farms with limited use of purchased inputs (Kavishe and Mushi, 1993). Small scale farmers are therefore seen as having the potential for increasing the country's agricultural production. Yet, without adequate financial resources, these farmers cannot acquire and use improved inputs necessary to increase production.

1.1.2 Benefits of credit to smallholder farmers

Loans allow farmers to purchase large capital items sooner than they would otherwise do. Credit can be an effective means of bringing labour, land and management into productive use and intensifying the productivity of those resources already employed. This potential gain in productivity resulting from credit use is the main motivation underlying many governments seeking to provide credit to the agricultural sector. However, the bureaucratic nature and difficult lending systems pursued by public and private commercial banks limit many small scale farmers from securing loans (Adams, 1988).

1.1.3 Specialised farm credit schemes

Based on the argument that small scale farmers lack access to commercial bank services due to difficult criteria in securing loans, some NGOs and government agencies in Tanzania have established specialised farm credit schemes to provide financial assistance for agricultural production. Such organizations happen to cater for the financial needs of specific target groups of people, or certain agricultural subsectors (Von Pischke, 1978 cited by Atieno, 1995). Such institutions have pursued policies guided by the development priorities of the government (Adams and Vogel, 1986) and are mainly funded by external/international donor agencies. They are expected to provide an impetus to agricultural innovation, especially to the small scale agricultural production subsector.

1.1.4 Credit and agriculture promotion in Tanzania

In accordance with its goal of promoting agriculture and rural development by directing credit to the rural population through formal channels, the Ministry of Agriculture and Co-operatives, under the umbrella of the Government of Tanzania and the World Bank, through the International Fund for Agricultural Development (IFAD) established a credit scheme for small scale farmers. This service was initiated as a project, its operations are in the Southern Highlands of Tanzania, covering Ruvuma, Mbeya, Rukwa, and Iringa regions. The project is called The Southern Highlands Smallholder Extension and Rural Financial Services Project (SHERFSP). The project has three major components; extension, rural credit support and credit management.

This study therefore aims to explore the role played by SHERFSP in extending credit to small scale farmers in Southern highlands using Iringa region as a case study.

1.2 Southern Highlands Extension and Rural Financial Services Project (SHERFSP)

1.2.1 Project background

The Southern Highlands Extension and Rural Financial Services Project (SHERFSP) was initiated in 1993. The aim of the project was to strengthen and finance the implementation of extension services along the lines of the National Agriculture and Livestock Extension Rehabilitation Project (NALERP) financed by the International Development Agency (IDA) in 16 other regions of the country.

The salient features of SHERFSP were to have demand driven extension services reflecting real needs of the beneficiaries as identified by them and including such features as: (a) introducing low-cost input technology which is easily understood by farmers; (b) ensuring that the needs of women both for extension information and credit are explicitly addressed; and (c) establishing a management system which is sensitive to and able to address the emerging environmental issues in the southern highlands. Finally the system had to be financially sustainable. An agreement was reached between IFAD and the Government of Tanzania on the basic framework of the new project in March, 1992.

1.2.2 Project objectives and benefits

1.2.2.1 The project objectives

The major objective of the project is to remove factors constraining smallholder productivity, family food security and incomes in general. The objective was to be attained through: (a) strengthening and enhancing the existing inputs, credit delivery system to better serve the poor; (b) developing a participatory, demand driven extension and community service system, that would be particularly responsive to the needs of poor families, and (c) ensuring the development and extension of appropriate technological packages to farmers and women, which are environmentally sound.

By December 1998 the SHERFSP had been implemented for a period of five years under the three main components namely: extension, rural credit support and credit management. This study covers rural credit support and credit management only. IFAD funding and support to the project comes to an end in the financial year 1998/99. After this period the project would be required to perform credit operations under its own financing.

1.2.2.2 Project beneficiaries

The project was expected to have a direct impact on the economic welfare of about 32,560 farm families. Indirectly, the project was also expected to benefit about 200,000 farm families by involving them in savings groups and by availing them with technical advice from the extension department provided by the government and the private sector. It was planned that women should become greatest beneficiaries of the project with

improved support in crops and livestock management, access to credit and assistance to income generating activities.

1.2.3 Expected outputs and results

The key expected result of the project was an improved extension system in the project area so as to enable better exploitation of existing production potential of the area. A strong and dynamic extension system capable of providing effective messages tailored to the farmers' needs with the aim of increasing yield levels of food and export crops was to be established. This was expected to contribute to improved household and national food security as well as raising nutritional levels and the standard of living, rural income, employment opportunities and export earnings.

Rural credit for agricultural production, storage, transport and marketing, micro-industries and other income generating activities were proposed to facilitate the adoption of improved technologies.

The project was also expected to strengthen the institutional structure for delivering services to the target group, thereby consolidating achievements made in previous project(s)¹ and ensuring that adequate field services are available for the farm households in the project area. It was envisaged that without the project, farmers would experience declining yields, reduced food security and succumb to environmental degradation.

¹ IDA-funded Cashew and Coconut Tree crops project; European Development Fund-Agricultural Sector Support Program; A DANIDA-funded Iringa Soil and Water Conservation Project; SIDA-funded women oriented Development assistance managed by ILO; FINNIDA-supported agricultural research at Uyole Agricultural College in Mbeya; CIDA-funded project promoting the use of oxen;

1.2.4 The Project's organisational structure

The project's organisational structure comprises of The Project Executive Committee (PEC), the Project Steering Committee (PSC) which provides a link between relevant ministries, namely: the Ministry of Agriculture and Cooperatives (MAC) and the Ministry of Community Development, Women and Children (MCDWC). There is a Project Co-ordinator (PC), Deputy Project Co-ordinator (DPC), Financial Controller (FC), Monitoring and Evaluation Liaison Officer (MELO), Credit Management Officer (CMO), and Extension and Credit Liaison Officer (ECLO). All these are stationed at the Project Co-ordinating Unit (PCU) headquarters in Mbeya. There is an Assistant Project Coordinator (APC), Savings and Credit Officer (SACO), Regional Monitoring and Evaluation Officer (RMEO), and Credit Officer (CO) in each region that is covered by the project. The above personnel work hand in hand with respective ministry's workers at the district level.

1.2.5 The Rural credit support component

1.2.5.1 The Savings and credit unit

The rationale for establishing the savings and credit unit as a supporting structure to rural credit was based on the gap created by the on going economic reform programmes which are based on liberalisation and privatisation, both in the commercial banking and co-operative sectors. As a result, farmer's access to credit is constrained by stringent collateral requirements posed by emerging (mainly urban based) financial institutions.

The unit was conceived to facilitate mobilisation and formation of Savings and Credit Co-operative Societies (SACCOS) by providing institutional support, primarily through training. In addition, it was supposed to provide data and experience as a base for future projects. The Ministry of Community Development, Women and Children (MCDWC) was earmarked to implement this component by establishing the Savings and Credit Unit (SACU) in the project.

1.2.5.2 Group formation and savings mobilisation

The objective of this activity was to enable smallholder farmers to form groups and pool their meagre resources to attain both effectiveness and efficiency in production. It was also believed that in such groups farmers would discuss and resolve commonly encountered problems. The rationale for savings mobilisation is to introduce among the rural community the habit of saving on a regular basis.

1.2.6 Credit management Component

The credit management section of the project oversees the Pilot Credit Scheme (PCS). The PCS is headed by a Credit Management Officer (CMO) who is also a member of the Project Co-ordination Unit (PCU). Under him there is a Loan Accounting Officer (LAO), who works hand in hand with the CMO at the PCU, and one Credit Officer (CO) in each region covered by the project.

1.2.7 The Pilot Credit Scheme and Types of credit

Delivery of credit on a pilot scale started in 1995/96 after being delayed for two years due to the restructuring process of the financial institution that was expected to administer the credit programme. A total of 11,860 beneficiaries were expected to benefit from five credit lines, namely farm inputs credit; stockists credit; transport trucks credit; small enterprises credit and animal drawn technology (ADT) credit. However, different types of credit proposed in the appraisal report could not be effected in the Pilot Credit Scheme. A major constraint was lack of a large enough financial institution to be contracted to manage what were viewed as large loans. It was therefore agreed to start with farm input loans on a pilot basis. In 1997/98 the project extended ADT credit. This study, however, focuses only on the farm inputs credit line.

1.2.8 Terms and conditions of Loan

1.2.8.1 Eligibility

To qualify for the farm inputs delivered in kind, the beneficiary had to be a cultivator of not more than 1.6 ha of land, an individual or group members must be residents of the project area. No credit was granted other than agricultural, agro-industrial or farm-related income generating activities.

1.2.8.2 Collateral and interest rate

In the absence of any other tangible assets, group guarantee is acceptable as collateral for farm inputs credit (and is commonly used). The interest charged on the credit is 26.5% per annum. This rate was adopted after considering inflation to avoid funds from being

eroded. The objective was also to make sure that administrative costs are covered by the interest rate.

1.2.8.3 Loan structure and repayment

All loans were supposed to be supported by properly designed and signed agreements. A loan agreement entered into between the project and its borrowers was a contract enforceable by law. A loan agreement was prepared only after a loan was approved, acceptable securities had been obtained, and where applicable the borrower's contribution paid. Loan repayment was an essential component in the project set-up. Maximum credit period for short term credit (farm inputs) advanced to borrowers was 12 months from the day a loan was disbursed.

1.2.8.4 Supervision and follow-up

Loan supervision and follow-up was carried out to ensure timely repayment of loans; be satisfied that the project is implemented according to the appraisal report; make sure that all parts of the loan agreement are being strictly adhered to and to assist borrowers in terms of advice on solutions for any unforeseen problems pertaining to the project as well as the right course of implementation.

1.2.8.5 Gender consideration

The baseline survey carried out by the project in 1994/95 financial year indicated that about 28% of the farmers living in the Southern Highlands regions can be categorised as being very poor (SHERFSP, 1997). Apparently, most of the households headed by

women fall under this category. In view of this, it was proposed that at least 30% of credit funds be disbursed to women's groups. There has been a particular effort to ensure that women have access to the project's credit facilities.

1.3 Problem Statement

The inability of the agricultural sector to produce enough output for the country has been attributed to a number of problems. Some of the identified problems include bad weather conditions, crop attacks by pests and diseases, inadequate knowledge of modern farm practices and poor infrastructural base. However, one identified major problem that accounts for the low agricultural production in most parts of the Low Income Countries is the poor financial base of small scale farmers (Feder *et al*, 1985; Mbata, 1993; Baliscan, 1993).

Although small scale farmers produce the bulk of the country's agricultural output, they do not have enough capital to cover costs of production, which in most cases include purchasing farm inputs. This particular problem is compounded by the fact that these farmers generally belong to the low income class who are unable to accumulate a reasonable amount of farm capital through own earnings. Even within the change of approach and prices of loans, strategies and efforts continue to direct credit to smallholder, a case in hand is that of SHERFSP.

However, there is little evidence that adequate credit services are provided to meet farmers' requirements on one hand, nor is there evidence that they are utilized

efficiently by the target groups. In addition, there is an observation that only few farmers receive this service due to the criteria underlying the accessibility of credit (Kashuliza, 1992; Mbata, 1993; World Bank, 1975).

Further, although it is assumed, a priori, that credit access overtime, ceteris paribus, leads to farm growth and increased income (Kashuliza, 1986), it is important to examine explicitly the impact of credit to farmers.

The above reasoning and arguments are the motivation of this study. The study tries to assess the role played by SHERFSP at the grassroots level, and it further makes an attempt to assess the performance of SHERFSP at an institutional level. The goal is to see whether there is sufficient supply of credit and efficient use of the same by smallholder farmers.

1.4 OBJECTIVES OF THE STUDY

1.4.1 General objective

The general objective of the study is to evaluate the role of the SHERFSP in extending credit to the small scale farmers in Southern Highlands of Tanzania and assess the impact of such credit on agricultural production of smallholder farmers.

1.4.2 Specific objectives

Subsumed in the overall objective are the following specific objectives:

- (i) To investigate the lending system of the SHERFSP credit.

- (ii) To assess the impact of agricultural credit by comparing the use of farm inputs and productivity between borrowers and non-borrowers.
- (iii) To examine the main factors which have a strong influence on securing and using credit.
- (iv) To investigate the problems encountered by SHERFSP and the small scale farmers in the disbursement and procurement of credit. The ultimate goal is to offer suggestions and recommendations for possible improvement in the design to offer such services.

In addition to the above objectives, the study assesses the performance of SHERFSP as it pertains to the goals and objectives set out in proposing the project, particularly those associated with agricultural credit. Issues in consideration are: loan performance and status of repayment; number of farmers who received loans against targets; increased use of inputs and whether there has been an improved input delivery system. Other assessments of interest include the process of groups formation and savings mobilisation and the number of savings and credit societies established.

1.5 Hypotheses

This study is governed by the following hypotheses:

Hypothesis 1: Small farmer's socio-economic characteristics influence loan acquisition from the SHERFSP.

Hypothesis 2: There is a significant difference in terms of farm input use, farm output and farm income between borrowers and non-borrowers of SHERFSP credit.

1.6 Organisation of the study

This study consists of five chapters. Chapter one presents an introduction, the research problem and objectives of the study. It also provides a description of the study area. Chapter two reviews relevant literature to the study. It reviews agricultural credit in LICs, default problems, informal finance and rural credit, operational problems of rural credit institutions in LICs, determinants of accessibility to and demand for agricultural credit. It also presents the methodological aspects used in other studies related to the analysis in this study.

The methodology adopted for the study is presented in chapter three, which summarises methods used for data collection and their sources, the sampling process and techniques used to test hypotheses. Chapter four presents results and discussion. Summary, conclusions and recommendations of the study are presented in chapter five.

1.7 Description of the study area

1.7.1 Location of Iringa region

Iringa region lies in the southern highlands of mainland Tanzania. The region is divided into six districts namely, Iringa urban, Iringa rural, Mufindi, Njombe, Makete and Ludewa. It has a total of 31 divisions, 113 wards and 627 villages. The region has a total area of 58,936 sq. km., of which 56,864 sq. km. is land and 2,072 sq. km. is covered by water. The area suitable for agriculture and livestock rearing is 41,947.8 Sq.km. Area under agricultural business is 4,644.13 sq.km which is equal to 11% of

the regional total land area (Regional Planning Office Files, 1997). The geographical location of the region is presented in Figure 1.1

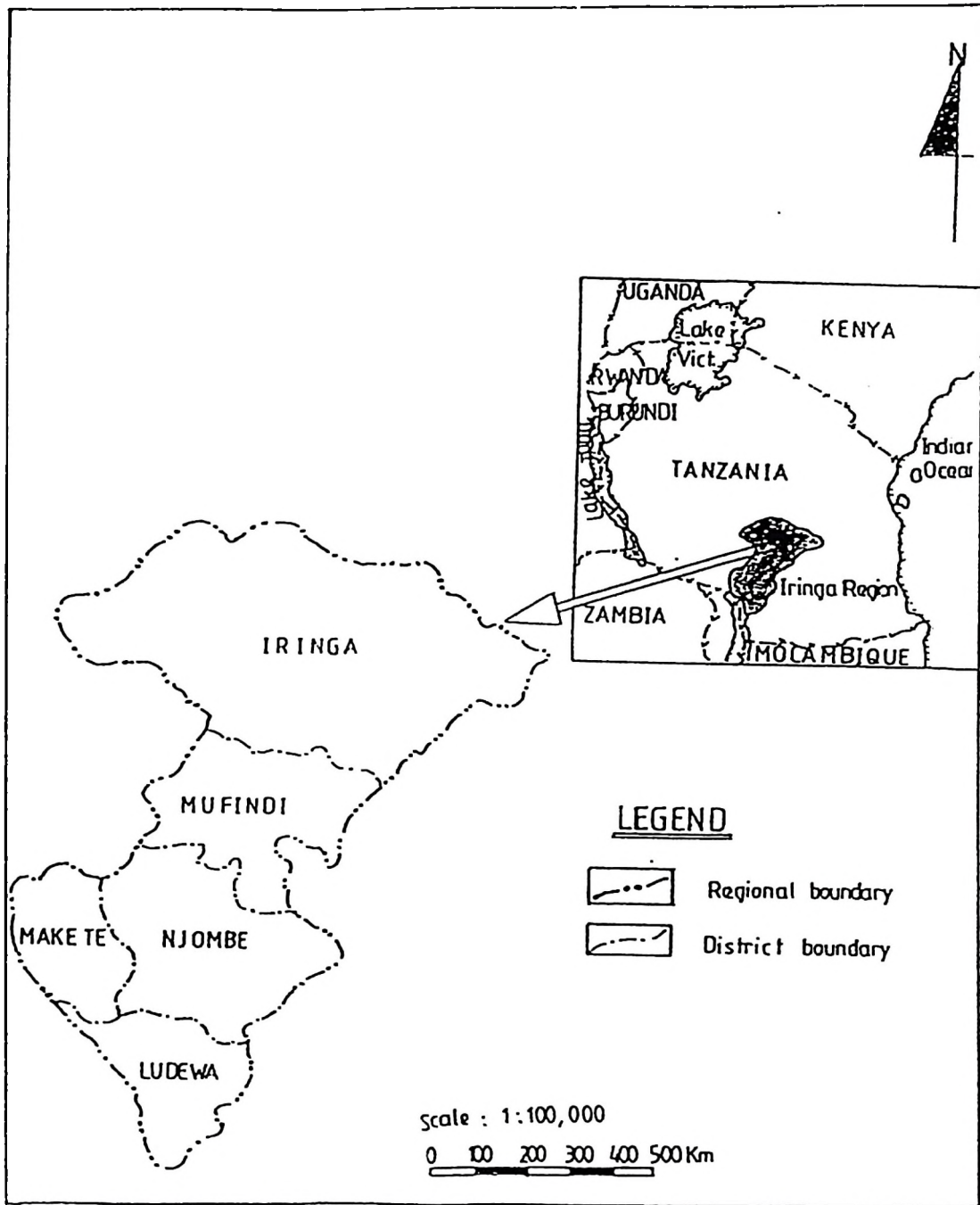


Figure 1.1. Map of Iringa region

1.7.2 Climate

The highland zone receives an average annual rainfall of 1,000 - 1,600 mm. for 200 to 280 days in a year. The middle zone receives an average annual rainfall of 600 - 1,000 mm., and the lowlands zone receives an average annual rainfall of 500 - 600 mm. The average temperature is 18°C, with November being the warmest month when the highest temperature is 25°C (Regional Planning Office Files, 1997).

1.7.3 Demography

According to 1988 census, the region's population size is 1,208,914 people, equal to 5.3% of the total population of Tanzania, which was 23,126,952 people. Population growth rate is estimated to be 2.7 (1988) and population estimates for year 2000 is 1,678,302 people. The population density is 21.2 persons per sq. km., and average household size is 4.8 people. In the 1988 population census, Iringa Rural, Njombe and Mufindi recorded the highest number of people than the remaining districts. There were 362,496 people in Iringa Rural, 313,991 people in Njombe and 229,259 people in Mufindi; while there were only 84,515 people in Iringa urban, 100,261 people in Ludewa, and 100,614 people in Makete district (Regional Planning Office Files, 1997).

1.7.4 Regional Economy

Agriculture is the main economic activity in the region. More than 90% of the population depend on agriculture for their livelihood. Livestock keeping and fishing are also undertaken. Other economic activities include mining; small and medium

industries. There is also few large industries such as Southern Paper Mills and Tea processing industries. Other important sectors in the regional economy are forestry and wildlife. The regional average per capita income in 1995 was estimated to be Tshs 102,570.

1.8 Description of Mufindi and Iringa Rural districts

Table 1.1 Summary of Mufindi and Iringa rural districts description

Item	Mufindi district	Iringa Rural district
Divisions	Divided into 5 divisions: Ifwagi, Sadani, Kibengu, Kasanga, Malangali. Has 28 wards and 130 villages	Divided into 9 divisions: Idodi, Pawaga, Ismani, Kalenga, Kilolo, Mlolo, Kiponzero, Mazombe and Mahenge. Has 26 wards and 182 villages
Total area (sq.km)	7,122	27, 458
-Arable land (sq.km)	6,166	16,607.85
-Area under cultivation (sq.km)	1,322	1,206.12
-Forest reserve (ha)	34,028	159,100
Population size:		
-1988 population census	229,259 people	362,496 people
-Annual growth rate	2.8%	2.7%
- Population density	39% people per sq.km.	12.7 people per sq.km.
-Estimation in year 2000	369,342 people	500, 576 people
Major cash crops	Tea, pyrethrum, coffee, and sunflower	Tobacco, sunflower, coffee, cotton and tea
Major food crops	Maize, beans, wheat, sweet and round potatoes, and peas	Maize, beans, round and sweet potatoes

Source: Data by Regional Planning Office 1997 and Census Report 1988.

1.8.1 Use of farm inputs

Amongst other factors, the level of production always depends on the type of farm implements and inputs used by the farmers. Due to high prices of inputs particularly following the removal of government subsidy on fertilizer since 1996, the use of inputs for crop production in the subsequent years has declined considerably. There is a big gap between the actual amount required and the amount currently used by farmers in the districts (Table 1.2).

Table 1.2. Mufindi and Iringa rural district: Use of farm inputs

(A) Mufindi district						
Year	Maize seeds (tons)			Fertilizer (tons)		
	Demand	Actual supply	Shortage	Demand	Actual supply	Shortage
1990/91	209	111.86	97.14	9,721	3,239.09	6,481.91
1991/92	199	45.046	153.954	9,721	3,913.95	5,807.05
1992/93	155	18.983	136.017	8,733	2,241.7	6,491.3
1993/94	125	23.43	101.57	9,750	1,691.8	8,058.2
1994/95	187	119.12	67.88	8,840	3,211.63	5,628.37
1995/96	128	0.901	127.10	11,759.5	1,060.92	10,698.58
(B) Iringa rural district						
1994/95	620	130.6	489.4	17200	15231	1969
1995/96	630	133.7	496.3	18950	15696	3254
1996/97	480	170.5	309.5	17400	10977	6423
1997/98	490	122.5	367.5	15500	8775	6725

Source: Mufindi DALDO's Office, 1997 and Iringa rural DALDO's Office, 1998.

1.8.2 The Districts Economy

Agriculture is the main economic activity in the two districts. Agriculture employs more than 90% of the population and provides more than 85% of the people's income. The other economic activities of great importance are livestock keeping and forestry. Both agricultural farming and livestock rearing are undertaken traditionally with low productivity levels.

However, there are few large scale agricultural based industries of varied sizes, including the pyrethrum extraction plant and tea companies such as Brooke Bond Ltd., which are engaged in tea production particularly in Mufindi district. These contribute greatly to the district and regional GDP. A number of wood related manufacturing industries have also sprung up in Mufindi district. The most important being the Southern Paper Mills Ltd. at Mgololo and a Saw Mill at Sao Hill. Other economic activities include bee keeping and fishing industry. The district per capita income in 1995 was estimated to be Tshs 158,100 per annum.

Apart from agriculture and livestock keeping in Iringa rural district, other economic activities of great importance are mining, tourism and few processing industries such as Ruaha Bottlers and Dabaga fruit canning. In 1996 the average GDP per capita was Tshs 97,305 per annum.

2.2 Agricultural credit in Low Income Countries (LICs)

In the last two decades, modernization of small scale agriculture has become a crucial issue for the economic development of many LICs (Kinimoz, 1982; Balisacan, 1993). As a way of increasing agricultural production, farmers in LICs have been encouraged to adopt new technology supported by agricultural credit. Until recently a supply led approach has been used by the majority of institutions in LICs to provide credit to small farmers (Khalilly and Meyer, 1993; Mitterndorf, 1987).

Observations show that this approach has had disappointing results for many institutions (Southwold, 1991), and to others has shown little success (Jabati and Heidhues, 1995). Other writers such as Von Pischke (1981, 1989); Adams (1982); and Mckinnon (1973) as cited by Nabi and Hamid (1989) have argued that, with regard to LICs, it is becoming uncertain whether agricultural credit in this form should continue to be supplied by donor agencies. The reasons given by the anti supply led-credit advocates include the schemes being not financially viable, which is partly due to high rates of default and the low interest rates they charge. Such credit programmes have become a form of subsidy that is being misused and is detrimental to development. Wealthy farmers have benefited most, and hence the schemes have increased socio-economic polarisation.

The authors have further argued that cheap credit discourages savings, which is essential for development. Such credit also leads to inefficient allocation of resources through rationing, following excess loan demand.

Furthermore, supply-led finance has serious weaknesses, it orients institutions away from potential savers and makes them excessively dependent on government loans and external donors' funds. To the loan recipients, intermediaries and farmers, it makes loans look like grants (Temu, 1994).

While it is accepted that agricultural development depends upon technological advancement of which credit may support its adoption, opinions differ with regard to the means and terms of delivering credit (Adams and Vogel, 1986; Von Pischke *et al*, 1983). Badly packaged credit is often seen as an input rather than as a claim on resources and services. Furthermore, credit does not lead to development if other non-financial problems are not addressed. Limitations posed by low product prices, low and unstable yields, lack of appropriate technology and inadequate extension, and inefficient produce markets cannot be overcome by cheap credit (FAO, 1986 cited by Mittendorf, 1987).

Jabati and Heidhues (1995), support the above arguments. They also point out that, most of the credit institutions have been government owned. They therefore carried political biases. Such credit institutions have been operating with high transaction costs, subsidized or artificially low interest rates and with cumbersome bureaucratic procedures. Failures of such institutions has been documented widely (Temu, 1994; Kashuliza, 1986; Adams, 1982; Von Pischke, 1989).

One, however, needs to question why formal agricultural credit programs have been so popular with national governments and western donors in developing countries. A fundamental reason is that economies of these countries are largely dependent on

smallholder agriculture whose farmers have little capital of their own (Kamajou, 1978; Kinimoz, 1982). Secondly, it is the ease with which credit programmes can be carried out in comparison with policies such as land tenure reforms, price controls, technological services, etc. (Howell and Adams, 1980 cited by Southwold, 1991).

Third, there is an intellectual bias against the informal sector. The informal sector is often viewed to be pushing ignorant and helpless farmers into debt in order to grab their assets such as land. Informal credit is also viewed as being exploitative and encouraging consumption rather than productive investment. Some policy makers are also convinced of the moral and technical superiority of the formal financial sector over informal one for supplying credit as an instrument for rural development (Bouman, 1989 cited by Temu, 1994)). On the contrary, informal institutions in some areas have been argued to be successful and present strong challenges against formal institutions. This is because of their intuitive lending approaches and simple operational procedures. This view is shared by a diverse group of writers on rural credit markets (Ghate, 1992; Braverman and Guasch, 1986; Van Dooren, 1990; Hoff and Joseph, 1990; Timberg and Aiyar, 1984).

Another important aspect worth noting at this point is the issue of collateral. Collateral or security for loans has traditionally been a pre-requisite by credit institutions before issuing loans to small farmers. Usually this involves the valuation of land holdings and capital items which are then sanctioned against loans. However,

most small farmers possess low value capital items and small land holdings without proper certified titles (World Bank, 1975; Zeller, 1994).

To some credit institutions, however, the outlook on collateral *vis-à-vis* the small farmer has been changing over time with more emphasis given to credit worthiness in place of common collateral. The new emphasis involves such parameters as the history of loan repayment, trustworthiness and the capacity to repay (Sanderatne, 1983; Kashuliza and Kydd, 1996). In addition, other important elements in assessing credit worthiness include the reputation of the individual within the area, the technical feasibility of the proposed enterprise, and expected cash flow generation (World Bank, 1975).

As early as 1975 the World Bank (1975) noted that credit stands little chance of being used for productive purposes unless it is accompanied by certain other elements including the following: clear opportunities to economic gain from the adoption of new production technology or other improvements; widespread recognition and acceptance of such opportunities on the part of the farmer, along with access to training in the necessary skills; and delivery systems which make the required inputs readily available at the time they are needed, and market outlets for farm products. Others include improved infrastructure and marketing systems.

A consensus is now being reached that the lack of institutional credit funds in LICs is mainly due to the difficulty of designing and establishing a system capable of both

issuing small loans to millions of small farmers and collecting these loans back again when due (Johnston, 1989). A major shortcoming of conventional agricultural credit policies has been the neglect of the variability of financial systems, which have so far depended to a large extent upon government and outside subsidies that are difficult to sustain. In order to provide continuity of financial services, sustainability of institutions delivering credit is important (Mittendorf, 1987; IFAD, 1998).

2.2.1 Seasonal inputs credit schemes

According to FAO (1981) as cited by Temu (1994) and Mittendorf (1987), the increased importance of, and growing demand for seasonal inputs such as fertilizer, pesticides, herbicides, fungicides, is based on the fact that the growth of agricultural production in developing countries depends to a large extent on the timely, sufficient, and cost-effective supply of agricultural inputs. This has led to many LICs governments to structure state delivery systems for agricultural inputs. However, World Bank (1995), has indicated that there are more reasons behind seasonal inputs credit schemes in developing countries, These may include: to encourage farmers' learning by doing, to reduce farmers' risk aversion, to reduce credit constraints, to help poor farmers, to maintain soil fertility, to offset disincentives caused by pricing policies, and to increase crop output per unit area.

2.3 The problem of credit default

A survey of literature on the performance of agricultural credit institutions in the LICs reveals that they have generally had dismal performance in their lending operations

(Kashuliza, 1992). The majority of the small farm credit programmes have been plagued with defaults (Vogel, 1981). Most of the institutions lose viability because of poor loan recovery, high transaction costs, inadequate follow-up by the institution responsible for collection and the decline in the real value of their loanable funds as a consequence of high inflation and low lending rates (Lele, 1975; Adams and Vogel, 1986; Braverman and Guasch, 1986).

Literature dealing with credit default is extensive, and causes of default vary between countries and credit programmes. Nevertheless, some of the major causes of the defaults include the unprofitability of the recommended production techniques, variability of incomes arising from crop failure due to natural calamities like drought and floods and or crop destruction due to fire, theft or other hazards. Other factors include the diversion of loans to other purposes by unscrupulous borrowers and attitudinal conditions. Some farmers who have used grants and subsidies in farming before, often perceive credit as a similar type of government grants, and therefore, wilfully default (Sanderatne 1983; Tinnermeier, 1981; Rwegasira, 1992).

Biseth (1987), was of the opinion that credit programmes supported by funds from external aid agencies often encounter loan repayment problems simply because both the farmer and the lending institution take loan recovery rather lightly. The author observed inappropriate lending terms which lead to the fixing of repayment schedules that do not synchronise with generation of income from the investment. Further, the author observed that, the unwillingness to impose sanctions by the lending institution

allows wilful defaulters to do so because the respective organisation can not pressurise the borrower to meet his loan repayment obligation. In addition, on the institutional side, the situation is made worse by lack of proper records and effective credit management and collection procedures, and at times capital transfers are not allocated optimally by the credit institutions (Adams, 1982; Von Pischke, 1989; and World Bank, 1975).

According to Kashuliza (1986) factors which contribute to bad loan repayment situations can be classified as follows: (a) those due to production and productivity at the farm; (b) those associated with the willingness (attitude) of the borrower to repay; (c) institution's operational procedures and loan collection efforts; (d) the inter-institutional co-ordination in marketing and loan collection; and (e) factors arising from the prevailing economic and political environment. It is important to note that the above mentioned factors are interrelated and as such, a farmer may fail to repay the loan for more than one reason.

2.4 Innovations to contend with default

A variety of solutions to alleviate the default problem have been proposed and generally these depend on the specific country, the nature of the programme and indeed the credit-disbursing agent. Some of the solutions include: rescheduling loan repayment in the event of widespread crop loss due to unforeseen factors, provision of adequate support services to farmers, resolving fundamental deficiencies in the

agrarian structure and eradicating excessively generous debt forgiveness (Sanderatne 1983).

2.4.1 Group lending

In recent times, an increasing emphasis is made to adopt group lending. This is a method of extending agricultural credit to small organisations rather than to individuals. Some analysts believe that joint liability (group responsibility) in group lending imposes group pressure to repay loans (Sanderatne 1983; Bratton, 1986; Zeller, 1998).

It is also argued that the use of credit groups reduces overhead costs, expedites the supply of seasonal inputs, improves credit institution-client communication and facilitates monitoring of produce and repayments (Maumbe, 1993; Webster, 1986; Okorie, 1991; Kashuliza, 1992; Nwanna, 1995; Mbata, 1993).

The success of the Bangladesh's Grameen Bank in using small groups of borrowers in servicing the poor and achieving high rates of repayment is now widely documented (Hossain, 1989). Other successful experiences include SANSA in Sri Lanka (Montgomery, 1996) and Credit Solidaire in Burkina Faso (Gurgand *et al*, 1994). In Thailand, the bank for agriculture and agricultural co-operatives which sometimes used groups consisting of as many as 30 members has also a record of achieving high repayment rates (Huppi and Feder, 1990; Yaron, 1994).

2.4.2 Credit linkage with marketing

A common practice employed by governments in LICs is to control the primary marketing of principal crops to facilitate the recovery of loans. This involves making a stop order on the proceeds from crop sales to marketing boards. The main attraction of the stop order system is that it ensures that the lending organisation is paid first.

However, several authors have criticised the stop order system on the grounds that it includes high operating costs and delays refunds to farmers. Moreover, the system has the disadvantage that farmers can get around the stop order by side marketing their crops (Chavunduka *et al*, 1982; Slangen *et al*, 1989; Kydd 1990).

2.5 Forms of agricultural credit

Credit may be provided in cash, kind or both depending on type of farm activity a farmer is anticipating to undertake. However, due to continued records of credit diversion to the majority of the small farmers in LICs, credit in kind has become a common and recommended approach to smallholder farmers. It was argued that diversion at farmer level could be avoided by supplying credit in the form of production inputs (see Lipton 1976, World Bank, 1979).

However credit in kind, packaged in crop marketing systems, targeted to small farmers, has also proved to be problematic, that is, it entails high operational costs and fails to off-set low producer prices partly resulting from the programme's high

cost. It may also break down the relationship between financial institutions and farmers, and cuts off all other financial services (Temu, 1994).

2.6 Informal finance and rural credit

An additional experience in rural credit has been that of informal finance. Informal finance exists, it presents strong challenges, and has succeeded in providing financial services to rural households (Bolnick, 1992; Ghate, 1992; Kashuliza, 1993; Timberg and Aiyar, 1984; Dejene, 1993), sometimes where formal institutions have failed.

Informal credit in LICs is dominated by money lenders mainly friends, neighbours, relatives, merchants, landlords, traders, shopkeepers, big farmers, and grain millers (Braverman and Guasch, 1986; Mlambiti *et al*, 1990; Kashuliza, 1993). According to Mlambiti *et al* (1990), friends, neighbours and relatives account for 90% of the main source of credit in the majority of rural population in Tanzania.

Informal credit is characterised by charging high interest rates compared to formal institutions (Braverman and Guasch, 1986; Eboh *et al*, 1991). Other characteristics include shorter processing time, better screening process or enforcement devices, low delinquency rate attributed to better assessment of credit worthiness, ability to exert social pressure to repayment (to defaulters) and the frequent practice of tying or linking credit contracts with other input or output contracts, for instance, share cropping. The procedures for securing credit are simple and are based on simple collateral, such as pledging durable assets or written agreements or permanent investments by the borrower; sometimes credit is extended depending on the

trustworthy of the borrower to the lender. An important characteristic is that informal credit operates within defined geographical boundaries and often within kinship lines (Braverman and Guasch, 1986; Hoff and Joseph, 1990; Mlambiti *et al*, 1990).

According to Holst (1985) as cited by Mittendorf (1987), the informal financial sector has been the subject of criticism for decades. Critics refer to bad performance and to the exploitation of poor borrowers. The activities of traders-cum-money lenders have been particularly singled out for criticism. There is often widespread suspicion of informal financial intermediaries based on horror stories that are often not representative and are repeated to sustain such a bias. In spite of such criticism, informal financial markets continue to operate and contribute towards rural development. Services are apparently responsive to customers' needs, are fast and require little documentation. Furthermore, transaction costs are low, repayment rates are high due to effective social control, and interest rates reflect market conditions and opportunity costs. (Mittendorf, 1987).

In other areas, informal private money-lenders have often been considered to have achieved what conventional credit system have failed to deliver. There are several examples, for instance, Mann (1989), reports that in India private money lenders have been reported to have made positive contributions to the adoption of new technology such as high yielding seed varieties of crops such as paddy, redgram, cowpea, horsegram, groundnut, wheat and sunflower.

Another important aspect that makes informal finance attractive and acceptable in rural areas is their approach and suitability of their methods (or more clearly, features). These include the minimal formal requirements or protocol, the use of borrowers' language or dialect, a rural style of dress, the proximity of the lender who is usually available close to home or to the local commercial center (Miracle, 1983). These features explain the apparent strength of informal money-lenders, which lies in their approach and suitability of their methods in LICs' rural areas.

Mittendorf (1987), concludes that many agricultural credit programmes have been supported financially by external donors and government subsidies. In spite of the efforts made in building financial institutions, a large proportion of farmers, in particular small framers, still depend upon informal financial markets. In some Asian countries, it has been estimated that less than 50% of farmers are served by banks. In Africa, the proportion may be only 10 to 20%. Thus, a major part of rural financial services particularly for small farmers, is informal.

2.7 Linkages between formal and informal financial markets in rural credit support

In spite of the efforts made to build rural banking institutions in developing countries, a large number of farmers, especially the poor, still depend upon informal financial markets. However, both formal and informal rural financial institutions have been found to contribute significantly to agricultural production and rural development (Kashuliza, 1993, Temu, 1994, Mittendorf, 1987, Ghate, 1992).

Linkages between formal and informal financial markets have become more apparent in recent years. Many informal lenders are borrowers from formal financial institutions and depend upon the conditions and terms that prevail in the formal financial markets; they act as important intermediaries to the mass of low-income borrowers (Mittendorf, 1987).

This has led some authors, e.g. Temu (1994), to argue that in order, therefore, to build a viable, feasible and sustainable rural financial market on one hand, and provide better financial services to rural dwellers on the other hand, it is imperative to merge applicable and useful features from both informal and formal institutions.

2.8 Savings mobilization and agricultural credit

Conventional approaches to agricultural credit have often overlooked the importance of savings mobilization, which is the other half of financial intermediation (FAO, 1985 cited by Mittendorf, 1987). Many of the government-sponsored agricultural and development credit institutions provide no deposit services (Mittendorf, 1985, Von Pischke *et al*, 1983). In the past, most policy-makers did not believe that the rural poor could save and only in recent years has there been growing awareness that deposit mobilization must receive priority and be considered as an integral part of a financial institution building (Adams and Vogel, 1986). Savings mobilisation not only contributes to domestic resource mobilization and to more equitable income distribution but it also facilitates credit appraisal and loan recovery. Balanced savings/loan approaches, where properly implemented, have led to a sustained high repayment level since lender's are more careful in extending loans and

in extending loans and recovering them if savings by neighbours and friends as well as their own are involved (Mittendorf, 1987).

Savings mobilisation is gaining momentum as a rural development strategy. Chimedza (1985) as cited by Maumbe (1993) points out that the payment of a deposit should be considered as a condition for seasonal loans. A growing body of literature on rural savings rules out the earlier impressions that because people were poor they were unable or unwilling to save. The crux of the problem centres on the notion that the rural sector needs only one form of financial service, i.e. credit. There is a growing belief that rural savings mobilization is a feasible undertaking (Temu, 1994).

Despite poor performance of many of the rural credit institutions in LICs, there are several promising experiments of rural financial institutions in different parts of the world. They offer promising alternatives to the conventional agricultural credit approach. The approach used by most of them include savings mobilization (Temu, 1994; Maumbe, 1993; Okorie, 1991; Kashuliza, 1992; Nwanna, 1995; Mbata, 1993; Bratton, 1986).

In summary the schemes exploit group members' strong social ties, to reduce risk, lower administration costs, enforce financial discipline and improve the quality of financial services. An example of this organisation is the Grameen Bank in Bangladesh, whose success has been eulogised (Hossain, 1989; Yaron, 1992). The

programme serves the poorest people in the society; it is based on savings mobilisation and issue loans but are jointly secured by social groups.

Another such arrangement is found in Malawi, where ten to thirty people form a group, mainly based on traditional kinship and communal lives to maintain loyalty and discipline. The groups receive agricultural production loans and get involved in savings mobilisation as security for acquired loans (Von Pischke and Rouse, 1983).

In addition, the authors also report on several other successful savings and credit schemes. For example, in Kenya , where they were formed to mobilise savings and issue credit to coffee farmers. The aspiration has been to offer as wide a range of financial services as possible. Another is the rural savings clubs in Zimbabwe which have also recorded some success, impressive progress being made in their basic task of mobilising savings particularly intended to finance agricultural inputs. In this arrangement members are encouraged to finance their input requirements with their own savings.

2.9 Strategies for improvement of rural financial institutions

Following the failures of most LICs' credit programmes and the whole supply-led approach to developing LICs rural financial markets, considerable criticism has been levelled at the conventional wisdom regarding credit need and institutions formulated to implement such strategy. To correct weaknesses of existing rural financial institutions requires the formulation of many new procedures, organisational aspects, methods of offering services, policy focus, among other aspects (Temu, 1994).

The development and adoption of an appropriate rural financial institution therefore requires meeting certain criteria and conditions of good innovations. Most important is its adaptability by the targeted beneficiaries. Several researchers have emphasized that the proper functioning of these institutions require farmer support and voluntary participation (Adams, 1989, Kolajo, 1993; Von Pischke and Rouse, 1983).

Critics place particular emphasis on the need for institutional efficiency, sustainable financial intermediation programs instead of credit programmes, evaluations based on financial criteria, e.g. aiming at low default rates, ensuring positive real interest rates, the productivity of loans and the need to integrate credit programmes within a comprehensive strategy of developing the financial market (Braverman and Guasch, 1986; Adams, 1992; Von Stochhausen, 1984).

A reliable organisational technology for lending to the poor of developing countries is important for an effective rural financial institution. Elements in such a technology are the freedom to charge interest rates which cover costs, the provision of savings facilities and adaptability of financial services through reliable module banking (Mosley and Hulme, 1998).

In the context of providing credit to the rural asset-poor, what are being increasingly called for are institutional innovations that combine prudent banking principles with effective screening and monitoring strategies that are not based on physical collateral such as land (Sharma and Zeller, 1997). The thrust here is not geared towards

inventing a completely new discipline contrasting the conventional institutional intermediation process. An innovation here refers to the alteration of defective features existing in present organisations. The novelty should be in the procedures organisation, institutional policy outlook and emphasis, location of offices and the like (Kamajou, 1978; Maumbe, 1993; Temu, 1994). There is also a need to increase pressure on borrowers so that they honour their loan repayment obligations (Maumbe, 1993; Anyanwu and Uwatt, 1993).

An effective credit system should be accompanied with a good link with the extension services so as to ensure the use of credit and its repayment. In this case, the extension services will ensure that the recommended farming techniques and inputs are within farmers reach (Lyatuu, 1994). Furthermore, criteria for providing credit to small scale farmers must be related to the special characteristics of the small farmers rather than the conventional banking principles as applied by commercial business. In this case, simple collateral such as assessing the farmers' farming business and possessions can be regarded as adequate security to their loan requests provided there is effective and proper supervision and technical advice. This will in a way increase the number of farmers benefiting from institutional credit.

2.10 Determinants of accessibility to and demand for rural credit

Generally, demand for credit in LICs is almost infinite. This is expressed by the need for adopting new technology, improvement in agricultural production and farm incomes and domestic self-sufficiency in food production, etc. (Kashuliza, 1986).

The effective demand however, for institutional agricultural credit by smallholder farmers depends on a wide range of factors including farmers goal, one's attitude to credit, other available resources, physical and socio-economic factors and the agricultural policy environment. Furthermore, accessibility to farm credit depends on such factors as education level, farm size, income level, household size, farmer's experience in farming and expenditure on inputs (Maumbe, 1993). On the other hand there are also factors which constrain farmers' accessibility to formal credit. Such factors include limited awareness of the available credit facilities, lack of previous experience in formal credit use, and gender of credit applicant (Kashuliza and Kydd, 1996). All above factors ought to be taken into consideration when analysing small farmers credit demand.

2.11 Assessment of the factors influencing demand for loans

Different methodologies have been suggested and adopted for assessing factors responsible for credit demand and accessibility to smallholder farmers. Some studies have used regression analysis where a credit demand equation was established (Maumbe, 1993). In this study, the author used regression analysis to investigate household factors affecting demand for institutional credit. Difficulties in regression interpretations arose, because some variables were not measured or recorded with reasonable accuracy e.g. farmers' attitude. Another difficulty with regression analysis, is the violation of the ordinary least square assumptions. When the assumptions are violated the validity of the model is in question (Kashuliza, 1986; Maumbe, 1993). The basic assumptions include absence of autocorrelation, heteroscedasticity,

homoscedasticity and multicollineality. It is important therefore for an analyst to perform relevant tests to see whether these assumptions have been seriously violated (Gujarati, 1988; Maddala, 1988).

Discriminant analysis has also been used in some studies to evaluate farmers' access to formal credit where a multivariate discriminant function is used to establish characteristics between farmers who get access to seasonal farm credit and those who do not, for example the study by Kashuliza and Kydd (1996). In the study, the authors observed that variables which best separate borrowers of formal credit and non-borrowers were: Awareness by the farmers on the available credit facilities in their villages, history of having used formal loans before, and contact with extension agents. Others were farmer's cultivated farm size, expected farm income, use of farm machinery in farming, and the education level. Stated differently, the significant discriminant variables described above represents the main constraints which majority of smallholder farmers face in accessing formal credit in the surveyed areas.

In studies such as factors determining loan non-repayments, loan demand, loan accessibility and factors that influence the savings behaviour of the rural people, most researchers prefer the use of regression analysis, partly due to its convenience in estimation using the ordinary least square technique and the simplicity in the interpretation of the coefficients (Sichinga, 1993; Okorie, 1991; Kashuliza, 1986; Zeller, 1998).

2.12 Credit impact assessment studies

Several studies on LICs' credit programmes have made use of descriptive analysis assessing the impact of credit schemes by comparing use of farm inputs, production and productivity before and after borrowing, or between borrowers and non-borrowers (Karakacha, 1992; Rajput and Verma, 1995). Others have used farm budgets to calculate gross margins for crop's enterprises. Farm budgets have been used to establish the profitability of these crop enterprises. The objective has been to measure whether a borrower generates profit from credit use (Maumbe, 1993). However, this method has some weaknesses. Major ones are (1) failure to combine resources in an optimal manner and therefore it cannot provide an optimal level of maximising revenue (Barnard and Nix, 1979) and (2) its level of accuracy depends on the composition of the variable costs, in turn these can vary from one farmer to another.

On the other hand, discriminant analysis has also been used to compare borrowers and non-borrowers as a way of assessing the impact of credit (Okorie, 1991, 1992; Kashuliza and Kydd, 1996). Sometimes, a significant difference between borrowers and non-borrowers has been observed. Some variables that have been found to distinguish the two groups include level of education, use of farm implements and inputs, total farm income and cash income from crop sales.

Some authors have gone further by pointing out that credit impact cannot be measured only with before and after comparisons or from simple comparisons of

recipients to non-recipients. A comprehensive analysis of selected variables that are associated with direct credit allocation is required (Bolnick and Nelson, 1990).

Most studies have used with and without approach. While properly defining impact as a with and without comparison, these studies reported methodological problems such as: weak data quality particularly with information, non-random sampling, inadequate questionnaire pre-testing, doubts about comparability between programme beneficiaries and non-beneficiaries, and lack of clear objectives. Furthermore, some of these studies compare beneficiaries against control groups using simple techniques such as cross-tabulation of descriptive data. This is not enough, econometric analysis is important to validate evaluation results (Bolnick and Nelson, 1990).

When one deals with time series data, a before and after approach is suggested (Anderson and Khambata, 1985). Conversely, a “with and without” approach is recommended when working with a cross-sectional data (Bolnick and Nelson, 1990; Rajput and Verma, 1995; Karakacha, 1992).

2.13 Summary

The conventional view of agricultural credit in LICs gives special importance to the number and volume of credit disbursed to smallholder farmers as a key element of success. Recently, opinions have been more critical of this conventional view. These critics have placed particular emphasis on institutional efficiencies, sustainability of the credit programmes, measured in terms of default and interest rates and the degree of

integration of the credit programme with the development of rural financial markets (Penny, 1983). Other relevant aspects include provision of market access and equitable treatment among borrowers, the degree to which the producer's financial needs are met and the productivity of loans (Letona, 1989 cited by Maumbe, 1993).

As it has been stated earlier, the rural sector in Tanzania employs the biggest part of the population, generates the highest proportion of the GDP, and contributes the highest proportion of its foreign exchange earnings. If the economy is to benefit fully from this most important sector it will need to be served by an efficient rural financial market. The rural financial market requires institutions which operate to serve the three dimensions of the market, that is, credit, savings and extended services. Appropriate rural financial institutions are amongst the most important elements in developing successful rural financial market. The problem of Tanzania's rural financial market can therefore be summarized as the lack of appropriate rural-based financial institutions. Efforts need to be directed towards designing and establishing self-sustaining rural financial markets to cater for the financial needs of rural dwellers.

This study used descriptive, regression and discriminant analyses to meet the objectives and test the hypotheses established. Details of the analyses are presented in chapter four.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Introduction

This chapter presents the methodology used in the study. It covers the study location, sampling techniques, data sources and collection methods, and data analysis techniques used in the study.

Most of the analysis of this study is based on descriptive analysis, presenting respondents' responses. Descriptive statistics are also used to assess the general performance of SHERFSP and other pertinent aspects of the project in the study area.

Quantitative statistics, i.e. discriminant and regression analyses have been carried out to accept or reject developed hypotheses in view of meeting the stated objectives of the study. Discriminant analysis is used to test the hypothesis whether there is a significant difference in terms of farm input use, agricultural output and farm income between borrowers and non-borrowers of SHERFSP credit. On the other hand, regression analysis is used to test the hypothesis of whether certain socio-economic characteristics influence loan acquisition from the SHERFSP in the project area.

3.2 Study location.

The study was conducted in Iringa region. The region is divided into six districts of Iringa Urban, Iringa Rural, Mufindi, Njombe, Makete and Ludewa. For the purpose of this study, data collection was done in Iringa Rural and Mufindi districts. The districts

were purposively selected to obtain a contrast between a good performer and bad performer of the project based on records and reviews provided by the project management. The performance of Iringa rural district was rated as being relatively good based on the rate of loan repayment (86.5%), whereas Mufindi has shown a relatively lower repayment rate (68.5%) in the past three years (SHERFSP, 1998). Inclusion of areas having such a contrast in performance, enabled the study to capture a broad spectrum of the project performance.

3.3 Sampling techniques

First, the two districts (Iringa Rural and Mufindi) were chosen as explained above. Secondly, divisions in each district linked with the project and villages that are beneficiaries of the SHERFSP credit were purposively selected. Two divisions of Kiponzelo and Mlolo, and five villages of Kihanga, Kaning'ombe, Ihemi, Ifunda, and Mgama were selected in Iringa Rural district; while three divisions of Kasanga, Malangali and Ifwagi, and seven villages of Kitasengwa, Ihowanza, Isimikinyi, Lwing'ulo, Lufuna, Sawala and Nyololo Shuleni were chosen. A total of five divisions and twelve villages were therefore studied. In selecting farmers, a simple random sampling technique was employed using a list of all the small-scale farmers benefiting from SHERFSP credit. A list of these farmers was obtained from SHERFSP offices in Iringa and from community development offices in respective districts. Farmers who had not received credit were also selected using a simple random selection technique. The sampling frame was obtained from village government offices. For the purpose of

this study a sample size of 120 farmers was established for interviews. The sample comprised of 71 borrowers and 49 non-borrowers of SHERFSP credit.

3.4 Data collection and sources

3.4.1 Primary data

The primary data from the sampled farmers was obtained by means of a structured questionnaire. The information collected included: household general characteristics, crop production, household sources of income including off-farm activities. Other information was on labour and information on the use of other farm inputs, SHERFSP credit, farmers' perception of credit and its benefits, problems in securing and using credit (Appendix 1). Before the actual survey, pre-testing of a questionnaire was conducted to check the relevance of questions and to determine whether the questionnaire was comprehensive enough to collect the required information. Some discrepancies were observed and modifications were made accordingly. The pre-testing exercise was conducted in the first week of December 1998 whereas the main survey was carried out from mid December 1998 to the end of January 1999.

3.4.2 Secondary data

Secondary data were collected in order to complement primary data, and they were obtained from the following sources: Iringa Rural district agricultural office, Mufindi district agricultural office, community development and planning offices in the two districts, and from the Iringa regional planning office. Other information was obtained from SHERFSP in Iringa region and from the headquarters in Mbeya. Data from the

regional agricultural and planning offices were mainly on socio-economic profiles of the districts and the region, while information from the community development office was on the number and performance of groups that are linked with credit schemes in the study area. Information from SHERFSP was sought for the following aspects: goals and objectives, organisation, lending operations and services, loan performance and repayment, problems in loan disbursement and achievements (Appendix 2).

3.5 Data analysis

3.5.1 Descriptive analysis

Statistics such as means, percentages, frequencies, were used to assess the response of farmers with respect to their view on SHERFSP credit. The analysis was also used to investigate credit procedures followed by SHERFSP, to assess farmer's response regarding their opinions on the benefits obtained from using credit and to investigate problems that are being encountered by farmers in procuring and using credit.

3.5.2 Institutional analysis

Institutional analysis was conducted to assess the performance of SHERFSP in loan disbursement to small-scale farmers and investigate problems encountered. Assessed aspects were loan performance and status of repayment; number of farmers who received loans against targets; the rate of use of farm inputs, performance of the input delivery system and effectiveness of lending procedures. Others were assessment of the process and rate of farmer groups formation and savings mobilisation, number of savings and credit societies established.

3.5.3 Regression analysis

The regression analysis was used to test the hypothesis that “*small farmer’s socio-economic characteristics influence loan acquisition from the SHERFSP*”.

The multiple regression analysis was employed to identify socio-economic variables influencing procurement of credit from SHERFSP. The linear regression form was adopted because past studies have found this formulation adequate in explaining the relationship sought by this study (Due, 1979a, Due, 1979b cited by Kashuliza, 1986; Maumbe, 1993).

The general credit demand regression model is as follows:

$$C_i = B_0 + B_i X_i + U_i$$

Transforming it into logarithmic form,

$$\log C_i = B_0 + B_i \log X_i + U_i$$

Where, C_i = ith value of the dependent variable

B_0 = Constant term

B_s = Independent variable coefficients

X_s = Independent variables

U_i = Random error term

i = ith observation

A similar credit demand function was estimated by Maumbe (1993).

The dependent variable is the average amount of seasonal loan (AVELOAN) obtained by a farmer from SHERFSP (in Tshs). To obtain a clear picture of the factors

determining acquisition of credit, non-borrowers were also included in the analysis. The independent variables are presented in Table 3.1

Table 3.1 Summary of independent variables used in the regression analysis.

Variable Estimated	Description
ACASHOFA	Average income from off-farm activities (Tshs)
ACREAGE	Average farm size under crop production (ha)
HIREDLAB	Whether a respondent used hired labour (dummy variable) (1 = Yes, or else = 0)
EDUCAT	Farmer's level of education (1 = no education, 2 = adult education, 3 = primary education, 4 = secondary education)
INPUTEXP	Average cash spent on purchase of inputs (Tshs)
EXPFARM	Farmer's experience in farming (years)
INFOSHHP	Awareness of the existence of SHERFSP(dummy variable) (1 = Yes, or else = 0)

Source: Survey data, 1998/99.

3.5.3.1 Expected signs from the variables' coefficients (a priori expectation).

ACASHOFA: Average cash from off-farm activities

Income from off-farm activities was expected to enhance farmers' confidence to borrow.

Such an income would assist in repayment in case something fell short in crop produce.

Therefore, as income from off-farm activities increase, the demand of a farmer to borrow is expected to increase. A positive sign was expected for the coefficient of this variable.

ACREAGE: Total farm size under crop production

It was expected that demand for credit would increase with increased farm size under cultivation, this is because farmers with relatively larger farm sizes would use more seasonal inputs, and therefore they are likely to seek large crop packages from SHERFSP. Thus, an increase in farm size would result in an increased demand for loans. A positive sign was expected.

AVECHLB: Average cost from hired labour

In a situation where a farmer hires labour, the latter becomes a component or an item under procured inputs. The budget for seasonal inputs is therefore spread more thinly. It is therefore expected that with an increase in hired labour, farmers will be compelled to borrow so as to meet seasonal input costs. The coefficient of this variable was expected to acquire a positive sign.

EDUCATE: Farmer's level of education

Farmers with relatively higher levels of education are expected to have a better knowledge about the role of credit, appreciate the benefits, and understand the procedures of getting a loan and meeting repayment obligations. Therefore, an increase in the level of education would increase the demand for credit. A positive sign was expected for this coefficient.

EXPFARM: Household elder' years of experience in farming

It was expected that experienced farmers were likely to be favoured by SHERFSP and hence approval of their loans. Reasons would be that they are established in the area, they are well known and are likely to be owning land. This is different in the case of young farmers who can easily be perceived as high-risk taking clients. The coefficient of this variable was expected to be positive.

INPUTEXP: Input expenditure

As the level of expenditure on purchased inputs increases, it was expected that the demand to borrow seasonal inputs from SHERFSP would increase. The sign of this variable coefficient was expected to be positive.

INFOSHP: Dummy variable for information on SHERFSP

Farmer awareness about available loan funds is an important step in procuring credit. It was expected that for a farmer to get credit from SHERFSP, she/he should first be aware of its existence. Therefore awareness regarding the loan funds at SHERFSP was expected to have a positive relationship with borrowing.

However, regression equations generated by ordinary least square are associated with a number of problems depending on the type of data used and the nature and form of the regression model employed in the analysis. The common problems encountered in regression analyses include multicollinearity, heteroscedasticity, homoscedasticity and autocorrelation (Gujarati, 1988; Maddala, 1988). To contend with this situation in the

study, relevant tests were performed to ascertain that the basic assumptions governing linear regression procedure were not seriously violated.

To test for multicollinearity problem values of coefficient of determination (adjusted R square) and the F-value were assessed for significance. In addition a correlation analysis of independent variables was done to detect whether there was high intercorrelation among the variables. Multicollinearity occurs when partial correlation coefficients exceeds 0.8 (Gujarati, 1988). The normality problem (homoscedasticity) was tested by plotting the observed and expected residual distributions against each other for a series of points (casewise standardised plot).

The Durbin Watson (DW) statistic was used to test for autocorrelation (serial correlation). Using the DW standard tables, when a value of DW obtained from the analysis is less than the lower value from the table, there is evidence of positive serial correlation, if DW is greater than the upper value from the table there is no evidence of positive serial correlation, but if DW lies between the lower and upper limit, there is inclusive evidence regarding the presence or absence of serial correlation (Gujarati, 1988). The heteroscedasticity problem was taken care by employing a logarithm to the equation.

3.5.4 Discriminant analysis

This analysis was used to test the hypothesis that, *“there is a significant difference in terms of farm input use, farm output and income between borrowers and non-borrowers*

of credit and also the test fulfilled the objective of assessing the impact of agricultural credit by comparing the users and non-users of SHERFSP credit."

Discriminant analysis, in general, is used to statistically determine variables that differentiate groups. In this particular study the objective of the discriminant analysis was to determine the socio-economic factors that differentiate between borrowers and non-borrowers of SHERFSP credit. Similar analysis has been employed by a number of other authors in rural credit and other rural development researches. These include Kashuliza and Kydd (1996) and Okorie (1991, 1992). This analysis was selected because the study deals with a cross-sectional data as suggested by Bolnick and Nelson (1990); Rajput and Verma (1995) and Karakacha (1992).

The estimated linear discriminant function was based on the following model:

$$D = B_0 + B_1X_1 + B_2X_2 + B_3X_3 \dots + B_nX_n$$

Where;

- D is a discriminant score of the canonical discriminant function
- Bs are weighting canonical coefficients estimated from the data
- Xs are the values of the discriminating variables.
- Bo is the function intercept
- n is the number of independent variables

Similar functions have been used by Temu (1994); Okorie (1991, 1992) and Kashuliza and Kydd (1996).

The canonical discriminant function is a linear combination of the discriminating variables which are formed to satisfy certain conditions (Klecka, 1980). Canonical discriminant coefficients maximise the ratio of between groups and within groups sum of squares. When canonical coefficients are standardised to adjust for unequal mean and standard deviation, they indicate the importance of the variables in the discriminant function. The equation above can therefore be presented as follows;

$$W = B_1X_1 + B_2X_2 + B_3X_3 \dots + B_nX_n$$

Where W is the discriminant score when the discriminant variables are standardised and other parameters are as defined in the equation above.

Since the study objective was to investigate if there are socio-economic differences between users and non-users of credit, then it was expected that the two groups must differ in D scores (Cooley, 1971 and Morrison, 1976 cited by Temu, 1994; Norusis, 1991).

3.5.4.1 Estimation of the discriminant function

There are several procedures to estimate the discriminant function, namely direct, hierarchical, and stepwise methods. The stepwise method, is the most generally applicable and is the one that was chosen for this study. The stepwise method was selected because of its exploratory nature, that is a combination of forward and backward selection of variables to enter the optimal discriminant function based on the minimum Wilks lambda, an acceptable tolerance level and the significance of a univariate F-test. The stepwise procedure also ensures that variables with low

tolerance levels (that is, ones that are almost a linear combination of included variables) are not entered into the function. The tolerance level is a measure of the degree of linear relationship between independent variables. In this procedure therefore, the effect of the addition or removal of an independent variable is monitored by a statistical test and the result used as a basis for the inclusion of that independent variable in the final analysis. When there are only two groups (as is the case with this study), there is just one discriminant function (Kinneer and Gray, 1994). To determine the overall significance of the discriminant function; eigenvalue, canonical correlation, Wilks lambda, chi-square and significance level were used. The eigenvalue presents a ratio between groups sum of squares of discriminant scores to within group sum of squares for a discriminant function. A large eigenvalue is associated with a better function i.e. a function that contribute to group separation. An eigenvalue is therefore a measure of standardised variance with a mean of 0 and standard deviation of 1. Because of the variance that each standardised variable contributes to principal components extraction is 1, a component with an eigenvalue of less than 1 is less important (Kinneer and Gray, 1994).

The canonical correlation coefficient measures the association between the discriminant scores and the groups. It represents the ratio of between groups sum of squares to total sum of squares. Because discriminant analysis seeks to lower variability within groups, a large canonical correlation coefficient is also associated with a good function, i.e. variability explained by differences between groups. Chi-square (in discriminant analysis) is

a transformation of lambda that has approximately a chi-square distribution. It can be used to test the hypothesis that group means are equal.

In discriminant analysis, a linear combination of independent variables, sometimes called predictor variables, is selected and serves as a basis for assigning cases to the selected categories or groups to achieve the best separation (Norusis, 1986 cited by Temu, 1994). In this study therefore important variables to explain farmers' socio-economic differences were selected (Table 3.2). The variables were selected with regard to their agricultural production and income, demography, inputs and off-farm cash earning activities. The binary grouping of farmers borrowed credit and those who did not was used.

3.5.4.2 Assessment of discriminant variables

There are a number of statistical measures that can be used in assessing the significance of the discriminating variables, for example Wilks' lambda (also called the U-statistic), Eta and Eigenvalue coefficients. This study uses Wilks' lambda. Large values of lambda indicate that group means do not appear to be different (equals 1 if they are all the same). Small values indicate differences in-group means (Kinnear and Gray, 1994). The significance of Wilks' lambda was assessed through the F-statistic. The F-value and its significance level were used. The contribution or significance of the variables in the estimated function was assessed through the canonical discriminant function coefficients, and function variable correlation coefficients (Norusis, 1986 cited by Temu, 1994; Kinnear and Gray, 1994).

Table 3.2. Discriminant analysis: Explanatory variables

Variable	Description
EDUCAT	Farmer's level of education 1 = no education 2 = adult education 3 = primary education 4 = secondary education
ACASHCRP	Average cash from crop sales (Tshs)
ACREAGE	Average farm size under crop production (ha)
INPURSE	Whether a farmer purchased inputs (0 = No 1, = Yes)
OFFARMA	Whether a farmer is doing off-farm activities (0 = No, 1 = Yes)
YBEANPHA	Average yield of beans per hectare (Kgs)
YMAZEPHA	Average yield of maize per hectare (Kgs)
YTOMAPHA	Average yield of tomatoes per hectare (Kgs)
The binary group variable used:	
FARMID	Whether a farmer is a borrower or non-borrower of credit: (0 = No, 1 = Yes)

Source: Survey data, 1998/99

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the findings of the study. First it presents an assessment of SHERFSP performance in the project area. It covers the lending system and procedure, loan performance and the status of repayment based on the information obtained from the SHERFSP. Repayment performance on farmers perspective are presented in section 4.2. Other issues include groups formation, savings mobilisation and problems encountered in loan disbursement. The general household characteristics, crop production and problems encountered by farmers in securing loans, sources of sampled farmers' income, and SHERFSP credit to farmers are also described. The chapter then presents results of regression and discriminant analyses with the aim of testing stipulated hypotheses.

4.1.1 SHERFSP lending operations and performance

4.1.2 Lending system

SHERFSP uses the group lending approach, commonly known as “solidarity lending system”. This system entrusts a group to guarantee loan repayment. It is envisaged that with this kind of a lending system, farmers will feel a collective responsibility to repay loans. Such joint group liability implies that all group members are sanctioned if anyone member does not repay his or her loan. The system is also regarded as a mechanism for lowering the cost of processing credit for smallholder farmers.

4.1.3 Lending procedure

Before sending an application to SHERFSP, there are pre-requisites that farmers need to accomplish. These include (a) farmers are required to mobilise themselves and form a group of between 5 and 10 people, (b) they must have an account in a commercial bank such as CRDB (1996) Ltd. with regular deposits and (c) if the applicants are repeated borrowers they must have repaid all previous loans. The exercise of groups formation is facilitated by community development officers in the area. However, there are other groups or societies that existed before the project. These are also required to submit applications following the set procedures. In a group, each member is supposed to submit an application indicating how much or the amount of inputs required. The requirements are then summed up and represent the amount required for the whole group. Screening of applicants starts at the village level where reputation, trustworthiness, familiarity in the village, and ability to perform farm activities are assessed by the village government.

Before forwarding applications to the village government, applicants are required to fill an application form providing information on the name of the group, its members, types of activity for which the loan is requested, the amount and type of inputs required and the total number of loans (see loan application form in Appendix 4). Applications are then forwarded to the district level where an appraisal of the loan is done. This is completed by the district loan committee comprising of a District Commissioner (DC) as a chairman, DALDO (secretary), District extension officer, District Savings and Credit Officer (DSACO) and District Community Development

Officer (DCDO). The recommendations are then made and applications forwarded to the regional office.

In the regional office the applications are further scrutinized by the regional loan committee for final approval. The committee comprises of the following members: The Regional Administrative Secretary (RAS) as a chairman, Credit Officer (CO) as secretary, Assistant Project Coordinator (APC), Regional Community Development Officer (RCDO), Regional Cooperative Officer (RCO) and Regional Agriculture and Livestock Development Officer (RALDO). After approval, the Credit Officer prepare requirements for each group and the minutes are then forwarded to the Credit Management section comprising of the Credit Management Officer (CMO) and Loan Accounting Officer (LAO) and then to the procurement section and finance for final payment. Credit officers in each region receive the packages from the headquarters and distributes them to the district offices where DSACO and DCDO receives for final delivery to farmers. Before receiving input packages farmers are required to sign contract forms which show the amount received in cash and the amount required for repayment when interest rate is included (see loan contract form in Appendix 5). Repayment is followed-up by community development officers at the ward level with the help of DCDO.

4.1.4 Group formation

At the commencement of the project in 1993/94, there were 263 informal farmer groups. This number rose to 1321 groups in 1995/96 season which is a 502% increase

(SHERFSP, 1996). The total number of groups in June 1996/97 were 2171, an increase of 164%. By the end of June 1998, a total of 1,800 groups were in existence. Out of these, 41% were male groups, 47% were female groups and 12% of the groups composed both male and female members. Table 4.1 presents the total number of groups formed at the end of 1996/97 and 1997/98 financial year. It can be noted from the table that the number of groups has decreased by 17% over a period of one year. The decrease was more remarkable in Ruvuma and Rukwa regions.

Table 4.1. Southern Highlands Regions: Performance of the formation of solidarity groups.

Region	Total number of groups		Percentage increase/ decrease
	End of June 1997	End of June 1998	
Iringa	455	469	3 ^b
Mbeya	603	634	5 ^b
Rukwa	420	224	47 ^c
Ruvuma	693	473	32 ^c
Total	2171	1800	17 ^c

Source: SHERFSP Annual Report, 1997/98.

Note: ^b and ^c denotes an increase or decrease respectively.

The decrease in the number of groups was mainly attributed to a project's shifts of its focus, from encouraging formation of new solidarity groups to supporting the existing groups in their income generating activities. This led to the disintegration of some credit groups which were formed solely for the purpose of seeking loans rather than have some concrete production objectives.

4.1.5 Savings mobilisation

As a result of a decrease in the number of solidarity groups, the total amount of savings also decreased by 27%. However, Iringa and Mbeya regions recorded an increase in savings by 57% and 166% respectively. Rukwa and Ruvuma regions have shown a decrease in savings as presented in Table 4.2. The reasons for this decrease in savings are the poor crop harvests in the 1997/98 season due to heavy rains of “el nino” and lack of markets for produce.

Table 4.2. Southern Highlands Regions: Status of savings mobilisation as at 30/06/1998.

Region	Total number of savings (Tshs.)		Percentage increase/ decrease
	End of June 1997	End of June 1998	
Iringa	11,171,249	17,496,010	166
Mbeya	17,742,420	47,107,117	57
Rukwa	15,323,861	11,240,000	(29)
Ruvuma	81,622,274	16,343,691	(80)
Total	125,859,804	92,186,818.00	(27)

Source: SHERFSP Annual Report, 1997/98.

Note: Figures in brackets denote a decrease

4.1.6 Promotion of Savings and Credit Cooperative Societies (SACCOS)

As of June 1998 the project had managed to promote a total of 192 SACCOS. This is an increase of 59% from the previous 1996/97 season when there were only 121 SACCOS. This increase occurred in all regions of the project area with Mbeya, Rukwa and Iringa regions recording a relatively higher increase as compared to Ruvuma (Table 4.3).

Table 4.3. Southern Highlands Regions: Growth of SACCOS, 1997 to 1998.

Region	Total number of SACCOS		Percentage increase/ decrease
	End of June 1997	End of June 1998	
Iringa	40	61	53
Mbeya	49	97	98
Rukwa	17	28	65
Ruvuma	15	16	7
Total	121	192	59

Source: SHERFSP Annual Report, 1997/98.

Recent efforts by the project to promote sustainable grassroots financial intermediaries has enabled the formation of 71 new SACCOS and thus bringing a total of 192 SACCOS with 22,178 members and a total savings of Tshs 238,139,249 by the end of June 1998. There was a significant increase in total savings in all the regions (Table 4.4).

Table. 4.4 Southern Highlands Regions: Savings at SACCOS as of 30/06/1998.

Region	Total number of savings (Tshs.)		Percentage increase/ decrease
	End of June 1997	End of June 1998	
Iringa	50,816,660	116,302,573	129
Mbeya	15,516,023	26,273,944	69
Rukwa	1,352,000	4,520,000	234
Ruvuma	82,524,513	91,042,732	10
Total	150,209,196	238,139,249	59

Source: SHERFSP Annual Report, 1997/98.

4.1.7 Performance of the Pilot Credit Scheme

As stated earlier, delivery of credit on a pilot basis started in 1995/96. A total of 11,860 beneficiaries were expected to benefit from five credit lines namely farm inputs, stockists' credit, transport trucks, small enterprises and animal drawn

technology loans. However, only two credit lines of farm inputs and animal drawn technology were effected as of December, 1995. Farm inputs disbursed were seeds of beans and tomatoes, fertilisers such as TSP, CAN, NPK, DAP and UREA and other chemicals such as Thiodan. Administration of animal drawn technology (ADT) loan started in 1997/98 season where such loans were issued to 69 groups. Out of these, 13 were in Mbeya, 34 in Ruvuma and 22 in Rukwa. Iringa region was not included due to delayed submission of applications. By the end of the 1997/98 financial year, a total of 3,522 group members, which is only about 30% of planned group members benefited from the credit scheme. About 85% of beneficiaries benefited from the farm input credit and the remaining 15% received animal drawn technology loans. The farm input loans were administered in three farming seasons of 1995/96 to 1997/98, whereas the ADT loans were issued in the 1997/98 farming season only.

4.1.7.1 Performance the 1995/96 loans

In the 1995/96 season, a total of 194 groups with 886 members received farm inputs loans in kind. Out of these, 61.5% and 38.5% were male and female members respectively. The repayment rates were as shown in Table 4.5. It is clearly seen that Iringa region had a relatively low repayment rate (i.e. 84.8%) as compared to other regions. The total repayment rate in the project area was 91.6% as of 31st December 1998.

Table 4.5. Southern Highlands Regions: Status of repayment of farm input loans of 1995/96 as at 31st December 1998.

Region	Number of groups	Group member			Total loan Principal + Interest (Tshs.)	Total repayment (Tshs.)	Repayment percentage
		M	F	Total			
Mbeya	61	219	92	311	26,911,901	25,426,166	94.4
Ruvuma	35	78	115	328	12,422,389	12,035,248	96.8
Rukwa	40	125	76	248	13,112,484	11,961,821	91.2
Iringa	58	123	58	181	20,156,068	17,097,007	84.8
Total	194	545	341	886	72,602,842	66,520,242	91.6

Source: SHERFSP Annual Report, December 1998.

4.1.7.2 Performance the 1996/97 loans

A total of 164 groups received farm input loans from SHERFSP. The groups comprised of 874 members of which 52% and 48% were male and female members respectively. The repayment rate for Iringa region (the study area) was 91.8%. This was an increase of 7.02% from the 1995/96 repayment rate. The repayment rates for other regions are as shown in Table 4.6.

Table 4.6. Southern Highlands Regions: Status of repayment of farm input loans of 1996/97 as at 31st December 1998.

Region	Number of groups	Group member			Total loan Principal + Interest (Tshs.)	Total repayment (Tshs.)	Repayment percentage
		M	F	Total			
Mbeya	63	259	242	501	45,853,494	41,194,588	89.8
Ruvuma	32	58	103	161	9,389,024	8,191,860	87.2
Rukwa	12	44	14	58	2,245,046	2,098,716	89.9
Iringa	27	93	61	154	8,575,290	7,875,834	91.8
Total	164	454	420	874	66,062,844	59,361,998	89.9

Source: SHERFSP Annual Report, December 1998.

4.1.7.3 Performance the 1997/98 loans

In the 1997/98 season, there was a decrease in the number of groups that received credit by 6.1% as compared to the previous (1996/97) season. The reason for this decrease is that some groups did not receive loans due to their failure to pay back their previous loans. As a result, a total of only 154 groups with 740 members received loans. Of these, 37.6% and 62.4% were male and female members respectively. The repayment rate for Iringa region was 82.1% (Table 4.7). This rate decreased by 9.7% as compared to the previous 1996/97 season. The reason for this decrease was partly due to farmers' failure to receive enough output as a result of the unfavourable weather widely referred to as "el nino".

Table 4.7. Southern Highlands Regions: Status of repayment of farm input loans of 1997/98 as at 31st December 1998.

Region	Number of groups	Group member			Total loan Principal + Interest (Tshs.)	Total repayment (Tshs.)	Repayment percentage
		M	F	Total			
Mbeya	68	103	179	282	53,318,987	37,077,895	69.5
Ruvuma	36	53	136	189	8,985,228	7,296,176	81.2
Rukwa	12	44	14	58	2,195,727	1,383,213	62.9
Iringa	38	78	133	211	21,595,535	17,733,017	82.1
Total	154	278	462	740	86,095,477	63,990,301	81.5

Source: SHERFSP Annual Report, December 1998.

4.1.8 Performance of SHERFSP in Iringa region

The repayment performance of loans in Iringa region varied across the districts. In the 1995/96 farming season, a total number of 58 groups received loans. The repayment rate for Mufindi and Iringa rural districts were 78.4% and 75.4% respectively. Makete had a relatively higher repayment rate as compared to the other districts in the region (Table 4.8).

Table 4.8. Iringa Region: Status of repayment of farm input loans of 1995/96 as at 31st December 1998.

District	Number of groups	Group member			Total loan Principal + Interest (Tshs.)	Total repayment (Tshs.)	Repayment percentage
		M	F	Total			
Makete	17			-	10,177,350	9,312,250	91.5
Ludewa	10			-	3,027,524	2,297,592	75.8
Iringa	11			-	3,161,446	2,384,847	75.4
Njombe	13			-	2,237,004	1,884,334	84.2
Mufindi	6			-	1,552,632	1,217,883	78.4
Total	40			-	20,156,066	17,097,006	84.8

Source: Iringa Region's SHERFSP Annual Report, December 1998.

In the 1996/97 season, a total of 27 groups comprising of 154 members received loans. Out of these, 39.6% and 60.4% were male and female members respectively. Mufindi, Makete and Njombe districts had a relatively smaller number of groups as compared to other districts. The repayment performance for Iringa rural district improved significantly when the repayment rate was 100% (Table 4.9). On the other hand, Mufindi district had a relatively low repayment rate of 62.4% implying that the non-repayment rate was 37.6%. The repayment rate for Njombe was also low, while Makete and Ludewa had a relatively good performance in repayment as seen in Table 4.9.

Table 4.9. Iringa Region: Status of repayment of farm input loans of 1996/97 as at 31st December 1998.

District	Number of groups	Group member			Total loan Principal + Interest (Tshs.)	Total repayment (Tshs.)	Repayment percentage
		M	F	Total			
Makete	3	14	0	14	905,719	876,300	96.7
Ludewa	13	28	49	77	5,168,521	5,010,308	96.9
Iringa	7	6	31	37	1,088,206	1,092,226	100.3
Njombe	2	10	0	10	636,460	412,500	64.8
Mufindi	2	3	13	16	776,382	484,500	62.4
Total	27	61	93	154	8,575,288	7,875,834	91.8

Source: Iringa Region's SHERFSP Annual Report, December 1998.

In the 1997/98 season, a total of 38 groups received loans. The groups comprised of 211 members, of which 63% and 37% were male and female members respectively (Table 4.10). The region experienced the lowest repayment rate as compared to the previous two seasons. The repayment rate was 82.1% (Table 4.10). As stated earlier,

this was partly due the “el nino” rains which prevented the majority of farmers to get enough crop harvests. Another reason was lack of markets for produce and lower producer prices especially for crops such as tomatoes. Due to low repayment rate experienced by Mufindi district in the 1996/97 season (i.e. 62.4), no loans were disbursed in the 1997/98 season.

Table 4.10. Iringa Region: Status of repayment of farm input loans of 1997/98 as at 31st December 1998.

District	Number of groups	Group member			Total loan Principal + Interest (Tshs.)	Total repayment (Tshs.)	Repayment percentage
		M	F	Total			
Makete	13	41	27	68	6,949,464	5,222,900	75.1
Ludewa	16	50	45	95	10,815,702	10,106,617	93.4
Iringa	9	42	6	48	3,830,367	2,403,500	62.7
Njombe	0	0	0	0	0.00	0.00	0.0
Mufindi	0	0	0	0	0.00	0.00	0.0
Total	38	133	78	211	21,595,533	17,733,017	82.1

Source: Iringa Region's SHERFSP Annual Report, December 1998.

From the above performance of SHERFSP it can be deduced that up to 1997/1998 financial year, only few farmers (3,522) have benefited from farm input credit and animal drawn technology loans compared to the target of 11,860 beneficiaries, which is only 30%. Out of these, 85% of group members benefited from the farm input credit and the remaining 15% from animal drawn technology loans. In view of the above it is evident that the project has led to an increase in the use of farm inputs. However, there is a room for the project to improve the input delivery mechanism. For example, the credit component for stockists was not effected in the Pilot Credit

Scheme. It was envisaged that stockists would make inputs available to farmers in the project area.

When one considers the gender focus of the project, we note there is no significant difference between number of women who received loans as compared to men. This is contrary to the SHERFSP objective of prioritising women to get this service. Statistics shows that the average number of farmers who received credit in 1995/96 to 1997/98 season were 833. Out of these male were 426 and female 411, which is 50.7% and 49.3% respectively. However, this is an achievement and efforts are required to ensure that more women benefit from the scheme.

4.1.9 Problems encountered by SHERFSP in loan disbursement

The performance of the project has been faced by inadequate resources and a non-conducive implementation environment. These include: the flow of funds which has been irregular and inadequate. Sometimes funds are received very late from the funding agency, and this delays activities. For example according to SHERFSP officials, in 1998/99 season SHERFSP was supposed to receive funds in July, instead the same were received in September, 1998. Furthermore, funds are sometimes disbursed in piece meal (instalments) leading to postponement of some important activities .

Project's transport facilities are not enough to allow adequate follow-up of beneficiaries. As a result, farmers are rarely visited. Infrastructure is very poor, some areas are very remote and hence it is difficult for farmers to be visited frequently.

Another problem is the untrustworthiness of the borrowers. Some farmers join the groups temporarily for purposes of fulfilling conditions for the loans. Such groups normally break-up after its members have received loans. There are cases where farmers have left their villages in an attempt not to repay loans.

Non-repayment therefore ranks high amongst problems faced by SHERFSP. When loans are not repaid on time they affect the general operation of the project because the money is required for further disbursement in the forthcoming season. Such money is also required to meet other costs such as those covering administration, fuel and maintenance of vehicles.

Human resource and management capacity at village level is also a constraint. Most SACCOS leaders and members are ignorant of the cooperative laws and operational procedures of their cooperative societies, causing them to operate inefficiently. In addition there is an acute shortage of staff in the cooperative department in all districts covered by the project. The available officers cannot cope with the workload of promoting SACCOS, training and auditing. There are also inadequate extension staff in the project area, following the civil service reforms that retrenched a number of extension workers.

4.2. Household characteristics

Demographic and socio-economic characteristics of the sampled farmers are summarised in Table 4.11. It is revealed that 71.2% of respondents in Iringa rural district and 70.5% in Mufindi district have attended primary education and only few have acquired secondary education in both districts (i.e. 5.8%). The results also show that farmers with no formal education were 3.4% and 6.6% in Iringa rural and Mufindi districts respectively. The remaining proportion (i.e.18.3%) have adult education, and this is the case in both districts. Although a large proportion of the sampled farmers have acquired primary education, there is an indication that the majority of respondents have adequate knowledge to support their smallholder agricultural production. The level of education possessed by farmers is reasonable and enables them to seek, receive and understand better agricultural technology advise from extension workers. They can also read posters, leaflets and publications prepared in Kiswahili and containing relevant information for agriculture.

With respect to age, 45% of the sampled farmers in both districts were between 36 and 45 years, while 30% were between 18 and 35 years of age. Also, 16.7% were between 46 and 55 years, while only 3.3% and 5.5% were between 56 and 60 years and above 60 years old respectively (Table 4.11). These findings show that 75% of the respondents were below 45 years. This suggests that the sampled farmers constitute an energetic group capable to participate in agricultural production.

Table 4.11: Iringa Rural and Mufindi Districts: Demographic and socio-economic characteristics of the sampled farmers

Variable estimated	Iringa (R) district		Mufindi district		Total sample	
	Number	%	Number	%	Number	%
Age distribution:						
18 - 35	14	23.7	22	36.1	36	30
36 - 45	27	45.8	27	44.3	54	45
46 - 55	12	20.3	8	13.1	20	16.7
56 - 60	3	5.1	1	1.6	4	3.3
Above 60	3	5.1	3	4.9	6	5
Total	59	100	61	100	120	100
Level of education:						
- No formal education	2	3.4	4	6.6	6	5.1
- Adult education	11	18.6	11	18	22	18.3
- Primary education	42	71.2	43	70.5	85	70.8
- Secondary education	4	6.8	3	4.9	7	5.8
Total	59	100	61	100	120	100
Gender of respondent:						
- Male	35	59.3	38	62.3	73	60.8
- Female	24	40.7	23	37.7	47	39.2
Total	59	100	61	100	120	100
Marital status of respondents:						
- Single	4	6.8	4	6.6	8	6.7
- Married	50	84.7	53	86.9	103	85.8
- Divorced	2	3.4	1	1.6	3	2.5
- Widowed	3	5.1	3	4.9	6	2
Total	59	100	61	100	120	100
Average household size		8.56		7.23		
Average farm size under cultivation (ha)						
- Minimum (ha)	0.44	-	5.33	-		
- Maximum (ha)	0.89	-	3.56	-		
Farm size categories (ha):						
0.40 - 1.55	18	30.5	29	47.5	47	39.2
1.56 - 3.0	34	57.6	30	49.2	64	53.3
3.10 - 4.0	6	10.2	2	3.3	8	6.7
Above 4.0	1	1.7	NA	NA	2	0.8
Total	59	100	61	100	120	100
Average crop income (Tshs)	165,025	-	151,278	-		
Average non-farm income (Tshs)	148,277	-	173,483	-		
Average household income (Tshs)	318,519	-	324,840	-		

Source: Survey data, 1998/99.

Regarding farm sizes, results show that farmers in Iringa rural district have an average farm size of 2.03 ha while in Mufindi district the average farm size is 1.64 ha. The minimum and maximum farm sizes are 0.44 to 5.33 hectares and 0.89 to 3.56 hectares for Iringa rural and Mufindi districts respectively. The majority of farmers interviewed in both districts have farm sizes between 1.56 and 3 hectares. It is also noted that only 10.2% and 3.3% of the sampled farmers in Iringa rural and Mufindi districts have farm sizes between 3.1 and 4.0 hectares respectively. While 1.7% of the interviewed farmers in Iringa district have more than 4 ha, there was no farmer in Mufindi district in this farm size category (Table 4.11). From the survey it was also observed that only 6.8% and 3.3% of the interviewed respondents hired land for crop production. This suggests that land is not a major problem in the study area, however all the sampled farmers fit well in the smallholder category.

Survey results further indicate that the average number of individuals per household is 8.36 and 7.23 for Iringa rural and Mufindi districts respectively. Based on age distribution, this is an indication of a satisfactory labour force in agricultural production.

4.2.1 Major cash crops grown by sample farmers in the study area

The survey results reveal that the majority of sampled farmers in Iringa rural district grow maize, beans, round potatoes and tomatoes, and a few grow sunflower as their major source of income. In Mufindi district the majority of respondents grow maize, beans, round potatoes and wheat. Other crops include tea, tomatoes, sunflower and

bananas. Percentages of farmers growing various crops are shown in Table 4.12. However, according to DALDO's records, major cash crops grown in Iringa rural district are tobacco, tea, coffee, sunflower and cotton. Crops grown in Mufindi district include tobacco, tea, sunflower, pyrethrum and coffee. Wheat and Bananas are not commonly grown in Iringa rural district, and tobacco is not commonly grown in Mufindi district. The major crop enterprises which farmers undertake on procuring loans from SHERFSP are maize, beans and tomatoes.

Table 4.12 Iringa Rural and Mufindi Districts: Major cash crops grown by sampled farmers.

Crop	Iringa (R) district (n = 59)		Mufindi district (n = 61)	
	Number	%	Number	%
Maize	50	84.7	56	91.8
Beans	48	81.4	55	90.2
Tea	NA	NA	17	27.8
Tomatoes	23	38.9	16	26.2
Round potatoes	27	45.8	34	55.7
Bananas	NA	NA	10	16.4
Wheat	NA	NA	21	34.4
Sunflower	9	11.8	15	24.6

Source: Survey data, 1998/99.

Note: NA means not applicable; Figures have multiple responses.

4.2.2 Major food crops grown by sampled farmers in the study area

Major food crops grown in Iringa rural and Mufindi districts and their respective percentages are presented in the Table 4.13 below. All respondents were reported to be growing maize and beans in both districts as their major food drops. Other crops in Iringa rural district include round potatoes and green peas; and in Mufindi district, wheat, round potatoes and green peas.

Table 4.13. Iringa Rural and Mufindi Districts: Major food crops grown by sampled farmers.

Crop	Iringa (R) district (n = 59)		Mufindi district (n = 61)	
	Number	%	Number	%
Maize	59	100	61	100
Beans	43	72.9	43	70.5
Wheat	NA	NA	33	54.1
Green peas	20	33.9	17	27.8
Round potatoes	30	50.8	29	47.5

Source: Survey data, 1998/99.

Note: NA means not applicable; Figures have multiple responses.

4.2.3 Main sources of income for the sample farmers

Agriculture is the main economic activity carried out by farmers in the study area. The majority of farmers depend on income from crop sales (supplemented by income from non-farm activities) for meeting their family and farm needs. Family needs include food, clothing, medical services, education and transport, where as farm needs entails the purchase of inputs such as fertiliser, seeds, insecticides and other chemical inputs. The average income per farmer obtained from crop sales is estimated to be Tshs 165,025 and Tshs 151,278 per annum in Iringa rural and Mufindi districts respectively (Table 4.11). This implies that there is no significant difference in terms of farm income in the two districts. This may be partly due to the level of production, farming systems, farming practices and farm sizes. Other reasons are exposure to markets and

producer prices which appears to be more less similar in the two districts. In addition to growing crops, farmers also keep livestock. Types of livestock kept include cattle, goats, pigs and sheep.

Distribution of the level of income from crop sales is presented in Figure 4.1. It is observed that the majority of respondents fall under the income category of less than Tshs 50,000 and Tshs 250,000 per annum, in both districts. Only 1.7% and 4.2% of respondents in Iringa rural and Mufindi districts have an income of above Tshs 500,000 per annum.

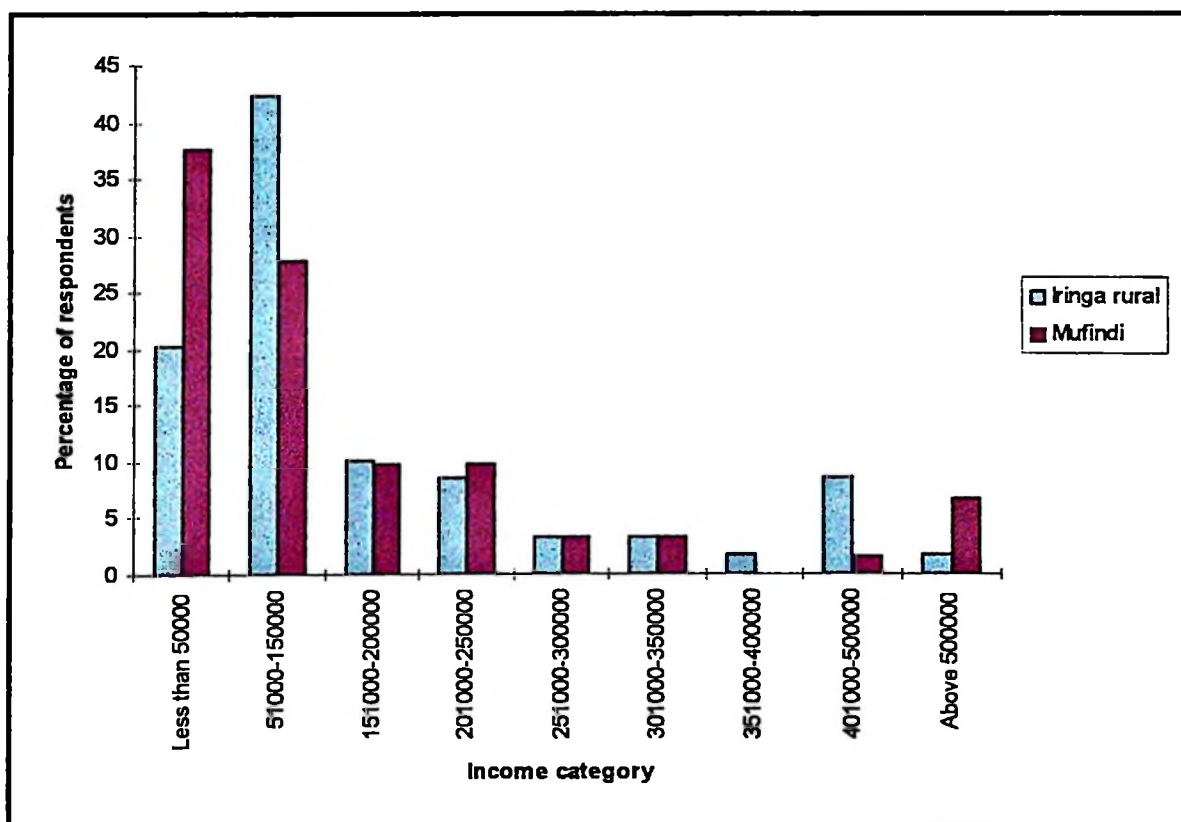


Figure 4.1. Iringa Rural and Mufindi Districts: Distribution of income from crop sales (in Tshs).

Source: Survey data, 1998/99.

Table 4.14. Iringa Rural and Mufindi Districts: Sampled farmers' engagement on off-farm activities.

Perform off-farm activities	Iringa (R) district (n = 59)		Mufindi district (n = 61)		Total (n = 120)	
	Number	%	Number	%	Number	%
Yes	43	72.9	50	82	93	77.5
No	16	27.1	11	18	27	22.5
Total	59	100	61	100	120	100

Source: Survey data, 1998/99.

Main off-farm activities include brewing and selling local brew, petty business, carpentry and brick making. Other activities include tailoring, fishery, masonry, and selling charcoal/firewood (Table 4.15).

Table 4.15. Iringa Rural and Mufindi Districts: Off-farm activities carried out by sampled farmers.

Activity	Iringa (R) district (n = 59)		Mufindi district (n = 61)	
	Number	%	Number	%
Selling charcoal/firewood	NA	NA	2	3.3
Brewing and selling local brew	26	44.1	17	27.9
Carpentry	6	10.2	8	13.1
Brick making	6	10.2	6	9.8
Masonry	NA	NA	11	18
Petty business	16	27.1	25	40.9
Tailoring	5	8.5	4	6.5
Fishery	NA	NA	6	11.5

Source: Survey data, 1998/99.

Note: NA means not applicable; Figures have multiple responses.

The average income from off-farm activities is estimated to be Tshs 148,277 and Tshs 173,483 per annum in Iringa rural and Mufindi districts respectively (Table 4.11). The distribution of this income shows that the majority of respondents are in the income

category of less than Tshs 50,000 and Tshs 200,000 in both districts. Only a few respondents have an income of above Tshs 500,000 per annum in both Iringa rural and Mufindi districts (Figure 4.2). It can also be seen from Table 4.11 that the average household income earned per annum from crop sales and off-farm activities is Tshs 318,519 and Tshs 324,840 for Iringa rural and Mufindi districts respectively. The distribution of the total income of the two districts is shown in appendix 7.

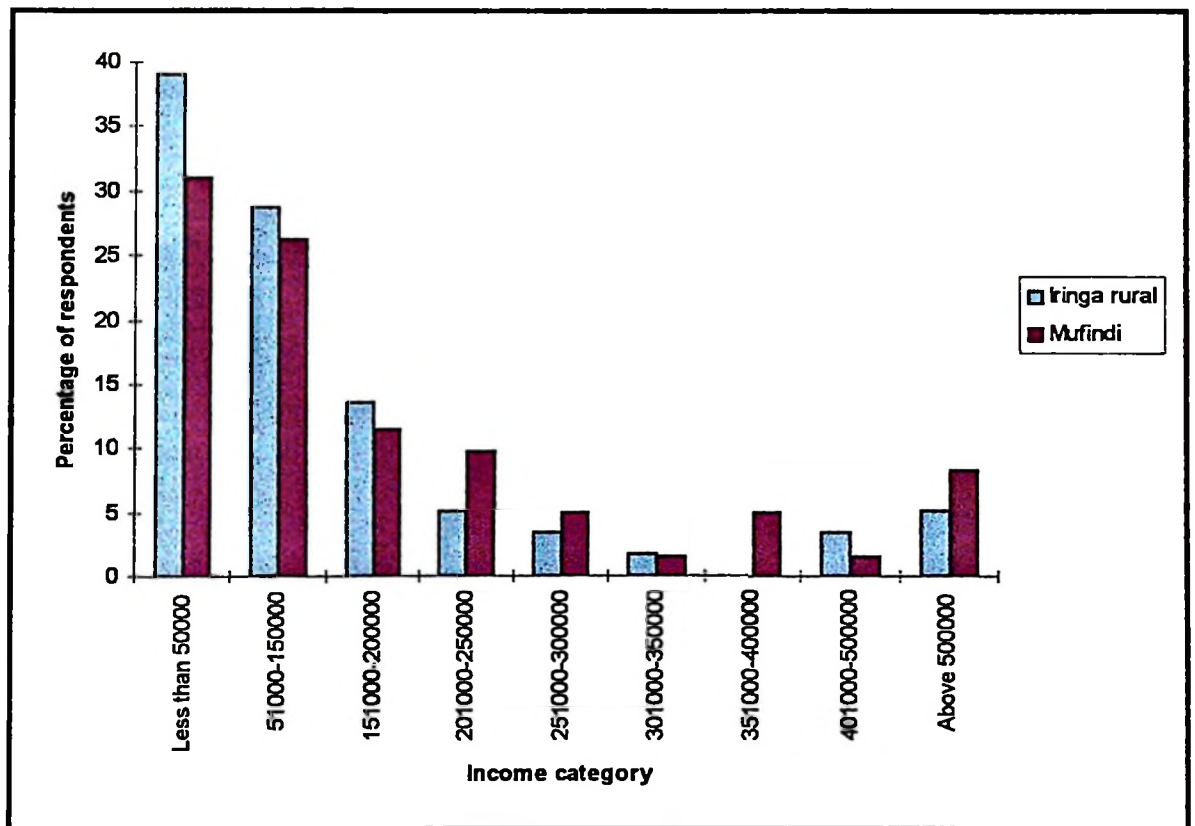


Figure 4.2. Iringa Rural and Mufindi Districts: Off-farm activities income distribution of the sampled farmers (in Tshs).

Source: Survey data, 1998/99.

4.2.4 Constraints encountered by sampled farmers in crop production

Respondents mentioned various factors that constrain their agricultural activities. Many farmers mentioned more than one problem (Table 4.16). Based on the number of times a factor was reported by sampled farmers as an indicator of importance, lack of capital to purchase inputs and lack of reliable markets to sell their crop produce ranked as the major constraints, both in Iringa rural and Mufindi districts. Other constraints mentioned were low producer prices, high input prices, shortage of farm inputs, shortage of extension services, damages caused by crop pests and the cost of transporting crops. Shortage of land and soil fertility problems were constraints of least importance (Table 4.16).

Table 4.16. Iringa Rural and Mufindi Districts: Problems encountered by sampled farmers in crop production.

Problem	Iringa (R) district (n = 59)		Mufindi district (n = 61)	
	Number	%	Number	%
Shortage of land	14	24	21	34
Soil fertility	16	27	4	7
Shortage of farm inputs	45	76	52	85
Shortage of extension services	40	67	49	80
Lack of market	51	86	54	89
High input prices	46	78	46	78
Cost of transporting crops	36	66	26	43
Damages caused by crop pests	39	66	48	77
Lack of capital to purchase inputs	54	92	58	95
Low producer price	51	86	52	80

Source: Survey data, 1998/99.

Note: Figures have multiple responses.

4.2.5 Loans received by farmers between 1995/96 and 197/98 crop seasons.

SHERFSP has been delivering loans to borrowers in kind on a pilot since 1995/96. However, in the 1995/96 season, SHERFSP failed to supply bean seeds which was one of the inputs provided on credit to farmers. As a result 44.1% of sampled borrowers in Iringa rural district were given both cash and inputs. Cash was given to enable farmers to buy the needed seeds. No loan in cash has been provided since the 1995/96 season, and no loan has been disbursed in Mufindi district in form of cash since the 1995/96 season (Table 4.17).

However, all borrowers are required to repay in cash. The amount to be repaid is calculated using existing market prices of the inputs in question during the time when loans are received. Based on this transaction, it can be said that the average loan received by sampled borrowers from 1995/96 to 1997/98 was Tshs 45,527 ranging between Tshs 10,200 and Tshs 109,800. Types of inputs received include improved seeds of beans and tomatoes, fertilisers such as TSP, CAN, NPK, DAP and UREA, and other chemicals such as Thiodan. All sampled farmers indicated that they sought for a loan from the SHERFSP only for production purposes.

Table 5.17. Sampled borrowers: Types of credit disbursed by SHERFSP.

Season	Loan type	Iringa (R) district		Mufindi district	
		(n = 34)		(n = 37)	
		Number	%	Number	%
1995/96	Inputs	19	44.1	37	100
	Inputs and cash	15	55.9	NA	NA
	Total	34	100	37	100
1996/97	Inputs	34	100	37	100
1997/98	Inputs	34	100	37	100

Source: Survey data, 1998/99.

Note: NA means not advanced.

4.2.6 Respondents' preference for the type of loan

Respondents showed differences in preferences in the type of loan they would wish to receive. Out of 71 recipients, 47.1% in Iringa rural district and 24.3% in Mufindi district preferred loans in the form of inputs (Table 4.18). The main reason given is that when a loan is issued in cash, it could easily be put into other uses e.g. consumption. Inputs provision avoids other expenses associated with procuring of the needed items e.g. transportation costs, especially if one is to purchase them from a distant town. Nevertheless 29.4% and 27.1% of sampled borrowers from Iringa rural and Mufindi districts preferred loans issued in form of cash (Table 4.18). The following reasons were given for preferring cash: (i) cash allows one to pay for other farm activities besides chemicals and fertilizers that require money e.g. hiring labour

and tractor, (ii) it allows one to buy on time the specific types of inputs required and (iii) it enables a farmer to invest in other income generating activities such as small businesses, poultry and pig keeping. It can also be noted from Table 4.18 that 23.5% of respondents in Iringa rural district and 48.6% in Mufindi district preferred loans to be extended as mixed packages containing both cash and in kind as a balance for reasons presented for the two scenarios above.

Table 4.18. Sampled borrowers: Preference on the types of loan.

Type of credit	Iringa (R) district (n = 34)		Mufindi district (n = 37)		Total (n = 71)	
	Number	%	Number	%	Number	%
In kind	16	47.1	9	24.3	25	35.2
Cash	10	29.4	10	27.1	20	28.2
In kind and cash	8	23.5	18	48.6	26	36.6
Total	34	100	37	100	71	100

Source: Survey data, 1998/99.

4.2.7 Adequacy of credit disbursed to borrowers by SHERFSP

For any credit to be of importance to the potential users, and yield what has been envisaged, it has to be adequate. In the survey, 64.7% of farmers who borrowed in Iringa rural district and 67.6% from Mufindi district complained that the loan provided was too small to fulfil their production requirements (Table 4.19). For

example, most farmers were provided with 1 to 2 bags of fertilisers (50 kgs each) which was only enough to cultivate a small area.

Table 4.19. Sampled borrowers: Adequacy of loan sizes disbursed from SHERFSP.

Whether amount was adequate	Iringa (R) district (n = 34)		Mufindi district (n = 37)		Total (n = 71)	
	Number	%	Number	%	Number	%
Yes	12	35.3	12	32.4	24	33.8
No	22	64.7	25	67.6	47	66.2
Total	34	100	37	100	71	100

Source: Survey data, 1998/99.

In addition, some borrowers complained that they did not receive the type of loans they had applied. Table 4.20, shows that 44.1% and 37.8% of sampled borrowers complained that they received types of inputs that they had not requested. The specific type of seeds and chemicals stipulated by farmers was not adhered to by SHERFSP. This resulted in forced revisions of farmers production plans.

Table 4.20. Sampled borrowers: Type of inputs requested and received.

Whether received type of inputs requested	Iringa (R) district (n = 34)		Mufindi district (n = 37)		Total (n = 71)	
	Number	%	Number	%	Number	%
Yes	19	55.9	23	62.2	42	59.2
No	15	44.1	14	37.8	29	40.8
Total	34	100	37	100	71	100

Source: Survey data, 1998/99.

4.2.8 Timely supply of seasonal inputs

Timely supply of inputs according to the seasonal crop calendar is an important aspect for borrowers to realise the benefits of credit. However, the survey indicates that 44.1% and 62.2% of sampled borrowers from Iringa rural and Mufindi districts respectively, experienced delays in receiving inputs from SHERFSP (Table 4.21). Farmers reported that the appropriate months for them to receive inputs are September and October, that is before planting commences in November. On the contrary, farmers cited cases where inputs were received late, i.e. November and some even early December, past the planting time. Such untimely disbursement of inputs has a negative consequence on crop performance and hence it directly affects the yield levels and ability of the farmer to repay. According to sampled borrowers, reasons provided by SHERFSP for this delay were that funds from IFAD (the funding agency) reached them late, inadequate transport facilities to cover all regions and

hence some farmers had to receive their inputs late. Another reason was that some farmers were late in submitting their loan applications.

Table 4.21. Sampled borrowers: Timely delivery of inputs.

Whether received inputs on time	Iringa (R) district (n = 34)		Mufindi district (n = 37)		Total (n = 71)	
	Number	%	Number	%	Number	%
Yes	19	55.9	14	37.8	33	46.5
No	15	44.1	23	62.2	38	53.5
Total	34	100	37	100	71	100

Source: Survey data, 1998/99.

4.2.9 Farmers' loan non-repayments

Non-repayment of loans was reported amongst the sampled borrowers. Out of 71 borrowers interviewed, 32.4% and 13.5% in Iringa rural and Mufindi districts respectively admitted to have not completed their loan repayment. The average repayment rate of the sampled borrowers was 77.5 i.e. the non-repayment rate was 22.5% (Table 4.22). The SHERFSP criteria, in principal, does not allow farmers to re-borrow when they have not fully effected their previous repayments. However, a previous good loan history enabled some of the borrowers to be given additional loans while in arrears. For example, in certain villages of Iringa rural district i.e. "Kihanga", 17.6% of the farmers were allowed to re-borrow while in arrears. This was allowed based on their good loan history of meeting repayment obligations in previous seasons. The level of arrears ranged from Tshs 4,000 to Tshs 93,850, averaging at Tshs 40,800. This average amount of non-repayment is large considering the average loan size of Tshs 45,527 received by a farmer in the study area.

Table 4.22. Sampled borrowers: Loans repayment and non-repayment

Item	Iringa (R) district (n = 34)		Mufindi district (n = 37)		Total (n = 71)	
	Number	%	Number	%	Number	%
Repayment	11	32.4	5	13.5	16	77.5
Non-repayment	23	67.6	32	86.5	55	22.5
Total	34	100	37	100	71	100

Source: Survey data, 1998/99.

4.2.9.1 Reasons for farmer's non-repayments

Farmers presented several reasons that led them not to repay. The major reported reason was poor yield due to bad weather condition. This reason was presented by 55.8% and 27% of sampled borrowers in Iringa rural and Mufindi districts respectively (Table 4.23). The survey results also show that 32.4% and 16.2% of borrowers in Iringa rural and Mufindi districts respectively failed to repay because of late delivery of inputs from the SHERFSP (Table 4.23). This resulted into low yields as inputs were not applied by farmers at the right time. In addition, 44.1% of respondents in Iringa rural district and 27% in Mufindi district reported low prices obtained from crops sold as a cause for failure to repay (Table 4.23).

Table. 4.23 Sampled borrowers: Reasons for non-repayments.

Reason	Iringa (R) district (n = 34)		Mufindi district (n = 37)	
	Number	%	Number	%
Inputs reached very late	11	32.4	6	16.2
Low prices for produce	15	44.1	10	27
Poor yield	19	55.8	10	27

Source: Survey data, 1998/99.

Note: Figures have multiple response, borrowers mentioned more than one reason.

4.2.9.2 Measures taken against non-rePAYERS

Measures taken against non-rePAYERS of loans include borrowers not being given an opportunity to re-borrow, more pressure is put with the help of village and ward government for borrowers in arrears to repay. Since there is a legal contract between a lender and a borrower, the final measure is for a borrower to be sent to court. However, this is not common and there is no record of such court cases.

4.2.10 Farmers assessment of the benefits obtained from SHERFSP credit

Farmers indicated that there are benefits obtained from using credit provided by SHERFSP. Results presented in Table 4.24 indicate that 82.3% of respondents from Iringa rural and 78.4% from Mufindi districts reported to have increased the use of farm inputs by using the loans provided. Farmers used inputs provided on credit to apply in their farms, something they would have not afforded otherwise. Another observation from the survey was that 61.8% and 76.5% borrowers in Iringa rural and Mufindi districts respectively, were of the opinion that the use of credit had increased their farm output (Table 4.24). They argued that the supplied inputs, especially when applied at the right time and in required amounts, resulted into good farm yields. The increase in farm output as a result of inputs applications, resulted into an increase in farm incomes. This was reported by 32.4% and 54.1% of sampled borrowers in Iringa rural and Mufindi districts respectively (Table 4.24).

Table 4.24. Sampled borrowers: Benefits obtained from using SHERFSP credit.

Benefit	Iringa (R) district (n = 34)		Mufindi district (n = 37)	
	Number	%	Number	%
Additional use of inputs	28	82.3	29	78.4
Additional farm output	21	61.8	26	76.5
Additional farm income	11	32.4	20	54.1

Source: Survey data, 1998/99.

Note: Figures have multiple responses.

4.2.11 Problems encountered on loan procurement and use from SHERFSP

A number of problems were reported by borrowers with regard to procurement and use of SHERFSP credit in the study area as presented in the Table 4.25. Many borrowers reported to have encountered more than one problem. Delay in delivery of inputs, inadequate amount of the loans received, poor supervision and follow-up by SHERFSP staff, and a high interest rate charged by SHERFSP were mentioned to be the major problems.

Delays in the delivery of inputs to borrowers caused them to apply the inputs at a wrong time. Small amounts of individual loans, inadequate to meet farmer requirements has led farmers to apply incomplete input packages. Some farmers decided to cultivate small land areas. Poor supervision and lack of a close follow-up by SHERFSP staff denied borrowers the assistance needed particularly when problems arose in the use of inputs. The interest rate being charged (i.e. 26.5%) by SHERFSP is argued to be high and farmers feel they would not be able to realise profits from the loans.

Other problems encountered include the poor markets for crop produce and lack of training in both credit management and input use. In addition, the loan procurement procedure and bureaucracy were reported to be very long. Some farmers have complained that the decision on what type of crops to grow is done by SHERFSP and not farmers by themselves. There was also a complaint that farmers received loans only in kind while they also preferred to be provided loans in form of cash. Such an arrangement made them unable to carry out other farm activities, for example they could not meet the costs for hired labour. However, 8.8% and 16.2% of sampled borrowers in Iringa rural district in Mufindi district reported not to have encountered problems in accruing and using the credit (Table 4.25).

Table 4.25. Sampled borrowers: Problems encountered in acquisition and use of loans.

Problem	Iringa (R) district (n = 34)		Mufindi district (n = 37)	
	Number	%	Number	%
High interest rate	23	67.6	24	64.9
Failure to repay loans	11	32.4	5	13.5
Delays in delivery of inputs	23	67.6	33	89.2
No training on credit management	16	47.1	20	54.1
Amount disbursed is not enough	28	82.4	30	81.1
Decision on what to produce is done by SHERFSP	20	58.8	18	48.6
Poor supervision and follow-up by SHERFSP staff	11	32.4	26	70.3
Lack of market for produce	18	52.9	20	54.1
Difficult to do other farm activities since only inputs are given	9	29.4	14	37.8
Loan procedure is bureaucratic	15	44.1	18	48.6
None	3	8.8	6	16.2

Source: Survey data, 1998/99.

Note: Figures have multiple response, farmers indicated more than one problem

4.2.12 Borrowers comments with regard to SHERFSP credit services

Numerous comments were put forward by borrowers suggesting ways to improve the effectiveness and efficiency of SHERFSP in channelling credit to smallholder farmers. These are summarised in Table 4.26. The information shows that 92.6% of the sampled borrowers prefer inputs to be delivered well in advance before planting time. Also, 84.5% have suggested that the amount of loan disbursed needs to be increased to enable farmers fulfil their farm needs as well as expand their farm sizes. To facilitate credit use, 80.3% of sampled borrowers have advised that SHERFSP ought to put more emphasis on training farmers in credit management so as to enable borrowers to repay their loans. Main emphasis here is knowledge of book keeping, basic accounting and proper recording of farm activities.

Furthermore, 76.1% of the respondents have advised that the interest rate should be reduced. They have complained that the current interest rate of 26.5% is very high. Apparently the Credit Management Section (CMS) of the project has already undertaken a review of the interest rate based on the fall in inflation and have put forward a suggestion that the interest rate should be 22%. Although this suggestion is yet to be effected, it provides evidence that farmers complaints are authentic. On another aspect, close supervision, follow-up and visits by SHERFSP staff is important so as to monitor what farmers do with credit, and their problems. This has been suggested by 73.2% of the respondents (Table 4.16).

It was noted from the survey that farmers in the study area faced a problem of markets for their produce, especially for tomatoes (Table 4.16), and hence it affects

their loan repayment ability. In this regard, 59.2% of sampled borrowers have an opinion that SHERFSP should assist farmers in finding markets for their produce. Other suggestions include: farmers should make own decisions on what they would like to produce instead of being told by SHERFSP staff; loans should not be for agricultural activities only, farmers should be given an opportunity to perform non-farm activities, and the procedure for getting loans need to be reviewed. Currently it is seen by farmers to be a very lengthy bureaucratic process that results into substantial delays (Table 4.26).

Table 4.26. Sampled borrowers: Comments in regard to SHERFSP credit services.

Comment	Respondents (n = 71)	
	Number	Percentage
SHERFSP should reduce interest rate	54	76.
Earlier delivery of inputs is required	66	92.6
Farmers should decide what to produce	37	52.1
SHERFSP should assist in finding markets for produce	42	59.2
Amount of loan disbursed need to be increased	60	84.5
Loans should not be for agricultural activities only	31	43.6
Procedure for getting a loan need to be reviewed	15	21.1
Close supervision of farmers is required	52	73.2
Training on credit management is important	57	80.3

Source: Survey data, 1998/99.

Note: Figures have multiple responses.

4.2.13 Informal sources of credit in the study area

Informal sources of credit were included in this study to compare the specific niches that they caters for. More important was to assess whether informal finance competes with the credit provided by SHERFSP. Apparently the findings showed that informal

credit provides for consumption needs. The SHERFSP does not provide credit in form of cash for purposes other than agricultural production.

Out of 59 interviewed farmers in Iringa rural district, 23 reported to have received loans from informal sources. This is 38.9% of the respondents. Out of 61 sampled farmers in Mufindi district, only 17 received loans from the informal sources (i.e. 27.9%). Farmers mentioned more than one source of informal credit. When these sources were ranked for importance based on the number of times a source was mentioned by respondents, relatives ranked first followed by friends, shopkeepers and then neighbours in Iringa rural district. In contrast, shopkeepers ranked first followed by relatives and friends altogether and then neighbours in Mufindi district (Table 4.27).

Respondents indicated that such loans assist them to pay hospital bills, school fees, buy food and cater for household emergencies such as illnesses and deaths. Friends, relatives and neighbours are heavily relied upon for such small loans. Loan sizes ranged from Tshs 2,000 to 10,000 per annum. Shopkeepers provide relatively larger loans, ranging from Tshs 2,000 to 25,000.

There is no explicit interest rate charged when one borrows from friends, relatives or neighbours. However, interest is charged when one borrows from shopkeepers. Even though, there is no fixed rate of interest charged by shopkeepers, but a specific agreement is always reached between a borrower and a shopkeeper. For instance, “I

will give you Tshs 10,000 and you are obliged to pay back Tshs 12,000 after one week". Sometimes, the borrower is assigned with a piece of work to cover the loan offered, for example weeding or cultivating a farm plot owned by the lender. In all types of informal loans, the mutual trust between the borrower and lender is the most important factor determining the transaction. These findings reveal that informal lenders play a role in financing the rural household to meet their consumption needs.

Table. 4.27. Sampled farmers: Types of informal sources of credit.

Source	Iringa (R) district (n = 23)			Mufindi district (n = 17)		
	Number	Percent	Rank	Number	Percent	Rank
Friends	10	43.3	2	8	47.1	2
Relatives	12	52.2	1	8	47.1	2
Shopkeepers	8	34.8	3	10	58.8	1
Neighbours	5	21.7	4	2	11.8	3
Total	NA	38.9	NA	NA	27.9	NA

Source: Survey data, 1998/99

Note: NA means not applicable

4.3 Regression analysis results

This section intends to test the hypothesis that: *small farmer's socio-economic characteristics influence loan acquisition from the SHERFSP.*

Regression analysis was used to determine factors influencing procurement of credit from SHERFSP. Since factors influencing demand for credit are those which have a strong influence in acquisition of loans, a form of a credit demand equation was adopted. The dependent variable was the average amount of loan received by a farmer from the SHERFSP between 1995/96 and 1997/98. To obtain a clear picture of the factors determining acquisition of credit, non-borrowers were also included in the analysis.

Independent variables include the average cash income from off-farm activities, average cost of hired labour, expenditure on inputs (besides those provided by the loan), information on SHERFSP existence, household elder's experience in farming, farmer's education level and the total farm size under regular cultivation.

In doing this analysis we tried to avoid all those factors that might have been influenced by the acquisition of loans. This is because data collection was conducted during the period when loans had already been procured. For example earlier in the analysis income from crop sales was included. The results showed that farmers with relatively higher income from crop sales had access to SHERFSP loans. The variable was later dropped because of the fact that the loans could have also been a factor that led to high level of farmer's income.

Results from the regression analysis indicate that the included independent variables accounted for 66.4% of the variation of the average loan obtained from SHERFSP. The F-test was significant at 5% level ($F=12.98948$), implying that independent variables significantly explain the variation in the amount of loans obtained by farmers from SHERFSP (Table 4.28).

Table 4.28. Regression results.

Variable	B	T	Sign. T
ACASHOFA	0.8194	3.241	0.0023*
ACREAGE	0.2786	0.859	0.6865
AVECHLB	0.6977	2.368	0.0011*
EDUCATE	0.1396	0.355	0.7238
EXPFARM	0.1122	0.079	0.9374
INPUTEXP	0.7948	2.028	0.0041*
INFOSHP	0.4929	1.536	0.0262**
CONSTANT	10210.2516	0.945	0.3488

F - value = 12.98948* Durbin-watson = 1.908
Multiple R = .82462 Standard error = .56881
R square = .67999 n = 120
Adjusted R square = .66361
*Significant at 5% level
**Significant at 10% level

Source: Analysis from survey data, 1998/99.

Regression results show that all significant variables were positively related to the average loan obtained from SHERFSP. These results were expected. The average cash form off-farm activities (ACASHOFA), average cost of hired labour (AVECHLB), and input expenditure (INPUTEXP) were significant at 5% level. Information on SHERFSP (INFOSHP) was significant at 10% level.

With increased level of off-farm activities, a farmer builds up confidence to borrow. Because cash obtained from off-farm activities could be used by a farmer in periods of insufficient crop produce and low income obtained from crop sales to repay the loan. Off farm income in fact boosts equity ratio and hence capability to repay the loans.

As it has been stated earlier, hired labour is an important input in crop production activities. It enables farmers to ensure timely adherence to the schedule of activities and complete farm tasks within required periods. An increase in the average cost of hired labour obliges farmers to seek for credit. Also, with an increase in the expenditure on inputs, farmers demand for credit increases because cash required to purchase farm inputs from own sources is not adequate.

The more a farmer is informed about the existence of SHERFSP the more is he or she willing to borrow. Normally one borrows from an institution that is known and existing in the area. This was a situation with SHERFSP, all farmers who received credit were aware of the institution in their areas, its objectives and modes of operation. The information was obtained from either the extension workers, community development officers and in some cases from SHERFSP staff. This augments the importance of an intense contact between SHERFSP staff and farmers.

Other three variables, namely household elder's experience in farming (EXPFARM), farmer's education level (EDUCATE), total farm size under cultivation (ACREAGE) were

also positively associated with the demand for SHERFSP credit and had coefficients with expected signs, but they were all not significant.

It can therefore, be concluded from the regression analysis that there are certain socio-economic characteristics which influence a farmer's access to loans from SHERFSP. These socio-economic factors which influence loan acquisition from SHERFSP are the average cash from off-farm activities (a basis for security), average cost of hired labour, expenditure on inputs (besides those provided by credit) and farmers' awareness about the existence of SHERFSP. All these signs indicate that SHERFSP loans are still accessible by the relatively well-off smallholder farmers. It is quite possible that the low income and relatively poorer farmers are not being served by the project. This can be closely linked to the lengthy and very bureaucratic process of applying and getting credit. The lengthier the process the costly it is to the farmers. This nature of SHERFSP loans could thus be screening out and biased against the poorer rural dwellers.

Relevant tests on regression analysis regarding ordinary least square assumptions were conducted, and the results show that there were no serious problems of autocorrelation, multicollineality and homoscedasticity. Heteroscedasticity problem was taken care by employing a log-linear regression equation. Details of the results on the tests are presented in Appendix 6.

4.5 Results of the discriminant analysis

This section intends to test the hypothesis: *There is a significant difference in terms of farm input use, farm output and farm income between borrowers and non-borrowers of SHERFSP credit.* Discriminant analysis was conducted to *assess the impact of agricultural credit by comparing the users and non-users of SHERFSP credit.*

Results of the discriminant analysis are presented in Table 4.29. The table presents the Wilks' Lambda, F ratio and its significance level for the function (univariate-statistic and univariate-F ratio). As stated in the methodology section, the smaller the Wilks' lambda the higher is the variation of the variables between the groups than within groups. Therefore, two points of interest here are the relative smallness of the Lambda and its significance level. The binary grouping of farmers borrowed and those who did not was used.

Table 4.29. Discriminant analysis: Univariate analysis

Variable	Wilks' Lambda	F	Significance
ACREAGE	.99414	0884	.772
ACASHCRP	.73948	5.2844	.0036**
EDUCATE	.99792	.0312	.8621
INPURSE	.91071	1.4706	.0240*
OFFARMA	.69388	6.6176	.0021*
YBEANPHA ^a	.97373	2.1061	.0073**
YMAZEPHA ^a	.96401	1.2438	.0628**
YTOMAPHA ^a	.73690	5.8102	.0033**

Source: Analysis from survey data, 1998/99.

* Significant at 5% level

** Significant at 10% level

^a These are the major crop enterprises carried out by farmers on procuring loans form SHERFSP.

4.5.1 Univariate statistic assessment

Results of the discriminant analysis indicate that out of the eight variables entered, six variables were significant in discriminating borrowers and non-borrowers of SHERFSP. The average cash from crop sales (ACASHCRP), yield of maize per hectare (YMAZEPHA), yield of tomatoes per hectare (YTOMAPHA) and yield of bean per hectare (YBEANPHA) were significant at 10% level. Off farm activities (OFFARMA) and input use (INPURSE) were significant at 5% (Table 4.29). Although one would think that there is a high correlation between average cash from crop sales and their yields, the latter was included because tomatoes, maize and beans are the major crop enterprises carried out by farmers after receiving loans from SHERFSP.

The analysis indicates that off-farm activities carries the most significant variable discriminating users and non-users of SHERFSP credit. The observation is supported by the fact that 94.4% of the borrowers are engaged in off farm activities as compared to 53.1% of non-borrowers in the studied sample (Table 4.30). We had also noted its significance as an independent variable in the regression analysis. The only plausible explanation here is that, farmers who seek for credit are those having entrepreneurial skills. This can be deduced from their tendencies to diversify sources of income and invest in businesses, e.g. off-farm earning activities.

Table 4.30. Borrowers and Non-borrowers: Engagement on off-farm activities

Whether performed off-farm activities	Borrower (n = 71)		Non-borrower (n = 49)	
	Number	%	Number	%
Yes	67	94.4	26	53.1
No	4	5.6	23	56.9

Source: Survey data, 1998/99.

Tomatoes, beans, and maize yields were also important discriminating variables. Yields of the named crops are usually associated with intensive crop husbandry. This requires a proper use of fertilizer and other chemical applications such as fungicides and insecticides, and borrowers have access to these facilities from SHERFSP.

The use of seasonal farm inputs was another important significant variable in discriminating users and non-users of SHERFSP credit. A large proportion of borrowers were found to use high levels of inputs than non-borrowers. Results from Table 4.31 show that 94.4% and 53.1% of borrowers and non-borrowers from both districts used inputs respectively. This implies that more input use is mainly a result of credit. Unless one gets a loan, use of farm inputs is minimal.

Table 4.31. Borrowers and Non-borrowers: Farm inputs use in Iringa Rural and Mufindi Districts.

Used inputs in crop farming activities	Borrower (n = 71)		Non-borrower (n = 49)	
	Number	%	Number	%
Yes	67	94.4	26	53.1
No	4	5.6	23	56.9

Source: Survey data, 1998/99.

The two variables: farm size (ACREAGE) and farmer's education level (EDUCATE) were insignificant in distinguishing the two groups (Table 4.29). It was found from the survey that the distribution of groups' education level and farm sizes are more or less equal in the two groups.

In fitting the canonical discriminant function, canonical coefficients of variables found significant in discriminating borrowers and non-borrowers of SHERFSP credit are used. Since there were only two groups in the study, there is only one discriminant function. Table 4.32, presents standardised canonical discriminant function coefficients and correlation coefficients.

Table 4.32. Estimated canonical and correlation coefficients for discriminating variables

Variable	Canonical coefficient	Correlation coefficient
ACASHCRP (Y1)	.47208	.40933
INPURSE (Y2)	.17122	.21593
OFFARMA (Y3)	.57517	.72370
YBEANPHA (Y4)	.42291	.36085
YMAZEPHA (Y5)	.16102	.11792
YTOMAPHA (Y6)	.51886	.43016

Source: Analysis from Survey data, 1998/99

Group centroids: Borrowers = +1. 1.13959; Non-borrowers = -1.62799.

Thus, the canonical discriminant function obtained is:

$$W = 0.47208Y_1 + 0.17122Y_2 + 0.57517Y_3 + 0.42291Y_4 + 16102Y_5 + 0.51886Y_6$$

The group centroids (average discriminant scores) are +1.13959 for borrowers and -1.62799 for non-borrowers. This confirms further that the two groups differ because the two groups are distinguished if their discriminant score values differ.

An overall assessment of the discriminant function in relation to the discriminating variables was made using the eigenvalue, canonical correlation coefficients, Wilks lambda, chi-square and its significance level.

Results reveal that, as far as the whole discriminant function is concerned, the variables discriminate the binary groups adequately, that is, variables identified by the stepwise procedure were significant discriminating variables. This is supported by the results of the canonical correlation coefficient (82.32%), eigenvalue greater than 1 (i.e. 2.1026), a Wilks' lambda of 0.54228, and a chi-square coefficient of 11.32 as presented in Table 4.33. It shows that the function is significant at 5% significance level.

Table 4.33. Discriminant function: A grand analysis

Item	Whole sample
Eigenvalue	2.1026
Canonical correlation	.8232
Wilks' Lambda	.54228
Chi-square	11.32
Significance	.0013*

Source: Analysis from Survey data, 1998/99.

*Significant at 5% level

4.5.2 Classification results and prediction qualities

The classification results and prediction qualities for the two groups further confirm the validity of the discriminant function. Since the objective of discriminant analysis is always to identify variables which optimally group cases into pre-determined binary groups, the effectiveness of the discriminant function in doing so is an important measure. The basis of the analysis is the predictions made by discriminant analysis as compared to observed frequencies. The optimal discriminant function uses the Bayes rule as a criteria to classify the subjects (Norusis, 1986) as cited by Temu (1994). It follows the formula:

$$P (G_i / D) = \frac{P (D / G_i) P (G_i)}{\sum_{1-n} P (D / G_i) P (G_i)}$$

Where; $P (D/G_i)$ = Conditional probability; i.e. a case is assumed to belong to group G_i , and the probability of observed discriminant scores given membership of the group is

estimated. It assumes that discriminant scores are normally distributed within the groups and normal distribution probability is used.

$P(G_i)$ = Prior probability; i.e. the likelihood that a case belongs to a group when information about it is available.

$P(G_i/D)$ = Posterior probability. If $P(G_i)$ and $P(D/G_i)$ are known, then the posterior probability can be calculated. It estimates the probability of being in group G_i , knowing the discriminant score. This is compared with the observed classification as per the binary variable to estimate misclassification. The results are presented in Table 4.34. Results provides an indication of the success rate for predictions of membership of the grouping variable's categories using the discriminant function developed in the analysis.

Table 4.34. Discriminant analysis: Classification results for borrowers and non-borrowers of SHERFSP.

Group	No. of cases	Predicted group membership*	
		Borrowers	Non-borrowers
Borrowers	71	64 (90.0%)	7 (10.0%)
Non-borrowers	49	7 (14.3%)	42 (85.7%)

Source: Analysis from Survey data, 1998/99.

* Percent of "grouped" cases correctly classified = 88.24%

The function classification is presented in a double row. The diagonals in the "predicted" column provide the correct and incorrect classification made. In the whole sample's function, 71 and 49 are the numbers of borrowers and non-borrowers respectively, the

function predicts 64 and 72 and hence it is correct by 90.0% and 85.7% in predicting borrowers and non-borrowers respectively. This implies that on average 88.24% of the respondents (cases) were correctly classified using the discriminant function, and that only 11.56% of the cases were misclassified. As the prediction value approaches 1, the higher is the prediction accuracy (Kinnear and Gray, 1994); therefore 88.24% shows accurate predictions and overall success rate for borrowers and non-borrowers.

As seen earlier, different variables were chosen as important in the discriminant function. Results of the classification analysis tell us that different socio-economic variables were found to influence differently borrowers and non-borrowers. However this differentiation is not in a clear cut fashion. This pattern can be visually appreciated by assessing Figure 4.3, generated from the discriminant procedure. The figure presents frequency distributions for the discriminant scores and the centroids position for the function. In a perfect "fit" all the borrowers would be normally distributed with a peak around the centroids; the same would be for the case with non-borrowers on the other side. In the figure, (a) and (b) represent histograms for borrowers and non-borrowers respectively, and (c) presents discriminant function for the two groups (all-stacked histogram). It reveals an overlapped frequency distribution of discriminant scores. This implies that there is no complete isolation (or more correctly separation) of farmers in terms of selected socio-economic variables. Some farmers in group 1 (borrowers) would belong to group 2 (non-borrowers), and vice-versa (also see Appendix 3 (a) and 3 (b)).

It can be concluded from the discriminant analysis that there is a significant difference in the use of farm inputs, farm output and farm income between borrowers and non-borrowers of SHERFSP credit. Other distinguishing variable from this analysis is farmers' engagement in off farm activities. This implies that the acquisition of credit from SHERFSP had an impact on farmers. Farmers who obtained credit used higher levels of inputs, had higher farm output and farm income. The role of SHERFSP in extending credit to small holder farmers can therefore be justified. Although there is an impact, the situation is not adequate because of the problems encountered in acquiring and use of loans. There is a lot to be improved within SHERFSP for loans extended to have a higher impact on the productivity of smallholder farmers. Several suggestions have been presented in recommendations section in chapter five.

In addition to discriminant analysis, the above eight variables were also assessed using a chi-square to test whether there is a significant difference between borrowers and non-borrowers (Table 4.35). Results show that the average cash from crop sales (ACASHCRP), yield of tomatoes per hectare (YTOMAPHA) and yield of beans per hectare (YBEANPHA) were significantly different at 5% level. Off farm activities (OFFARMA) and input use (INPURSE) were significantly different at 1% level, and yield of maize per hectare (YMAZEPHA) was significant at 10%. Farm size (ACREAGE) and farmer's education level (EDUCATE), were not significantly different between the two groups.

Table 4.35. Summary of cross-tabulation results for discriminating variables by farmer category (borrowers and non-borrowers) of SHERFSP credit.

Variable name	Chi-square value	Significance level
Cash from crop sales	8.17	5%
Farm size	12.06	NS
Education level	4.02	NS
Input use	21.05	1%
Off-farm activities	28.36	1%
Yield of beans per hectare	6.31	5%
Yield of maize per hectare	7.46	10%
Yield of tomatoes per hectare	25.13	5%

Source: Analysis from Survey data, 1998/99.

Note: NS means non significance

CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1. Summary of findings and Conclusions

The overall objective of the study was to evaluate the role of the SHERFSP in extending credit to smallholder farmers in Southern Highlands of Tanzania, and assess the impact of such credit on agricultural production of smallholder farmers.

The specific objectives of this study were to (i) to investigate the lending system of SHERFSP credit, (ii) to assess the impact of agricultural credit by comparing the use of farm inputs and productivity between borrowers and non-borrowers, (iii) to examine the main factors which have a strong influence on securing and using credit and (iv) to investigate problems encountered by SHERFSP and the small scale farmers in the disbursement and procurement of credit. The ultimate goal was to offer suggestions and recommendations for possible improvement of the lending procedure of SHERFSP. In addition to the above objectives, the study assessed the performance of SHERFSP as it pertains to the goals and objectives set out in proposing the project, specifically concentrating on those associated with agricultural credit.

To achieve these objectives, data from sampled farmers were gathered and secondary information on SHERFSP performance was also collected. Qualitative, regression and discriminant analyses were used in the study to deduce necessary findings and test the set hypotheses.

The results of the field survey conducted in the study area found that credit is important for farmers in order to meet their farming obligations. In general, surveyed farmers' incomes are low and require technological advancement to increase their productivity, incomes and standards of living.

5.1.1 Loans received and forms of credit

Farmers who borrowed from SHERFSP received credit in kind i.e. in the form of inputs. However, some farmers have indicated that they would also prefer credit to be disbursed in form of cash so as to enable them to invest in non-farm activities. The major argument for preferring loans in cash is that it is extremely difficult to separate farm activities and non-farm activities as far as the household needs are concerned. It is suggested that earnings from off-farm activities would increase the overall farmer's income and also stand as a security when there is a failure in crop production. It was also observed that some households in the study area relied on informal sources of credit to cater for needs other than production inputs, particularly consumption items.

5.1.2 Timeliness in the supply of seasonal inputs and adequacy of credit

Delays in the supply of input was common a complaint. At times inputs were supplied very late such that recommended application schedules could not be followed. It was also found that supplied inputs were sometimes different from those known to farmers or were different from those demanded and formally requested during loan applications. This has led to either inappropriate usage of the inputs or reluctance by farmers to use them at all. The amount of inputs disbursed was also not adequate to meet farmers' requirements. This

led farmers to cultivate small acreages. Therefore, the issue in the Southern Highlands is not only the supply of credit, but it is important for it to be delivered in time and in adequate amounts for it to have a higher impact on the productivity of the smallholder farmers. Timely supply of credit and inputs may be ensured by simplifying the procedures for applying and approving loans.

5.1.3 Supervision

There is poor supervision of farmers' activities by the SHERFSP staff and extension workers, and thus farmers face many problems in using credit. There were also cases of lack of information for the farmers regarding the use of inputs, especially when new ones were introduced. This was partly due to inadequate extension services in the area as a result of civil service reforms whereby a number of extension workers have been retrenched. A clear observation is that, once a loan has been allocated, close supervision is required to ensure that farmers get the necessary help in form of information and advice to assist them in their farm operation and management activities.

5.1.4 The lending procedure

Another complaint lodged against SHERFSP operations, is the inconvenience caused by the lengthy bureaucratic procedure in acquiring loan. To illustrate, the procedure for one to get a loan requires approvals starting from a group or society, a village government, district, region up to the headquarters. This long chain scrutiny is a major problem that delays loan approvals for smallholder farmers.

It can therefore be concluded that the delays in the supply of inputs, inadequate amounts of such inputs, supply of farm inputs different from those formerly applied, the lengthy bureaucratic procedure of loan approval defeats the very purpose of the project. The intended increased use of inputs and additional farm output might not be easily realised. Delayed credit and hence farm inputs will fail the project objectives. Credit is useful only if it yields the full envisaged results. For that matter, credit needs to be provided in sufficient amounts and needs to be timely.

5.1.5 Loans repayment performance

Like several other credit institutions in LICs, SHERFSP has faced loan non-repayment problems. Where as the overall repayment rate was 91.6% for the 1995/96, it dropped to 89.7% and 81.5% in 1996/97 and 1997/98. This implies that the non-repayment rate has been increasing over time. Factors that have contributed to the deteriorating repayment situation emanated from both the institution and from the borrowers. Considering the institution, the main factors are poor supervision and follow-up due to inadequate funds and lack of adequate staff, while on the farmers side the main cause are delays in the delivery of inputs from SHERFSP, low prices received from crop produce and poor yield due to bad weather conditions.

5.1.6 Assessment of the benefits accrued from using SHERFSP credit .

Farmers have indicated that there is an increased use of farm inputs, additional farm output and additional farm incomes as a result of using credit from SHERFSP.

However, besides the benefits there are a number of problems encountered by farmers in their efforts to get loans and its use from SHERFSP. Delays in delivery of inputs, inadequate amounts of loans received, poor supervision and follow-up by SHERFSP staff and high interest rate charged by SHERFSP were the major problems. Others are a lack of output markets for crop produce, lack of training on credit management and the long and bureaucratic procedures for getting loans.

5.1.7 Socio-economic characteristics that influence loan acquisition from SHERFSP

Following a regression analysis on 7 variables, it was revealed that certain socio-economic factors influence the acquisition of loans from SHERFSP. Such characteristics are income from off-farm activities (a basis for security), average cost from hired labour, high expenditure on farm inputs (besides those provided by credit) and information about the existence of SHERFSP in the area. These factors were identified as having a strong influence on loan procurement from SHERFSP

5.1.8 Differences between borrowers and non-borrowers in farm input use, farm output and farm income

Following a discriminant analysis, there was a significant difference in farm input use, farm output and farm income between borrowers and non-borrowers of SHERFSP credit. Other socio-economic factor that distinguished borrowers and non-borrowers engagement in off-farm activities. This implies that the use of inputs from SHERFSP had an impact to the productivity of smallholder farmers. Those who obtained credit used higher levels of

inputs, had higher farm output and farm income. This justifies the importance of credit to smallholder farmers.

5.1.9 Group formation and Savings mobilisation

The strategy to enhance farmers development through farmers' group formation and savings mobilisation has shown improvement since the project started its operations five years ago. Many groups have been formed and savings mobilized through such groups has taken place. The main constraint to savings mobilisation is the absence of rural based financial institutions or savings institutions in the study area. The criteria from SHERFSP requires farmers to deposit money in a recognised commercial bank such as CRDB (1996) Ltd. Such institutions are located far from the villages, and hence it discourages farmers to save since it involves them to travel. It has also been found that it is mainly high income earning farmers who maintain savings.

5.1.10 Interest rate

With regard to interest rate, a constant interest rate at 26.5% per annum was charged on all loans from 1995 to 1998. This rate was set considering the level of inflation by then and to make sure that real lending and administrative costs are covered. Overtime, however, there has been a clear need to revise the rate. Inflation has been on a constant decline since 1997.

5.1.11 Performance of the SHERFSP

Overall, the SHERFSP faced a number of operational and financial problems. These problems are the flow of funds which has been irregular and inadequate. As a result some activities are postponed or delayed. Transportation facilities are inadequate and do not allow adequate follow-up of beneficiaries. Infrastructure is very poor, some areas are very remote and hence it is difficult for farmers to be visited frequently. Other problems include non-repayment of loans and most SACCOS leaders and members are ignorant of the Cooperative laws and operational mechanisms of their Cooperative societies, causing them to operate inefficiently. There is also a shortage of extension workers in the project following the effect of civil service reforms whereby a number of extension workers were retrenched.

5.2 Recommendations

Based on the major findings and conclusions of this study the following are recommendations that may lead to a better performance of SHERFSP. These recommendations can also be useful to other related rural development projects in Tanzania, particularly agricultural credit programmes.

First, it is important for SHERFSP to deliver inputs well in advance before planting time. To facilitate this exercise, farmers should be informed on the need to forward their applications early enough. In addition, for farmers to realise benefits from loans, the amount disbursed should be enough to meet their requirements. It is also important to deliver inputs in kind as requested by the farmers.

Second, to facilitate credit use, SHERFSP should put an emphasis on credit management training to assist farmers to better manage their loans. The most successful credit scheme is the one that integrates loans with literacy training particularly on basic bookkeeping, farm records and basic accounting. This will ensure that farmers are equipped with the necessary skills to enable them use their loans effectively and productively. To make it simple, introduction of record books to borrowers and regular monitoring of the proper recording of the necessary information is important.

Third, a constant interest rate has been charged by SHERFSP since the project started its operations. This rate has been maintained at the same level even when the inflation has fallen. In such a situation the project is on the advantage side at a heavy cost on farmers. A rational interest rate will encourage more farmers to participate in the project. In this view, the SHERFSP should try to review this rate. However, besides lowering it, the interest rate charged must be enough to cover the project's lending and administrative costs.

Fourth, farmers face problems with agricultural products' market information. They do not know where to sell their crop produce. SHERFSP should try as much as possible to find markets for farmers' produce and inform farmers immediately about the same. This will be achieved by making contacts with marketing agents in various parts of the country. Where possible, these marketing arrangements need to be made early enough before the harvesting time.

Five, close supervision of farmers is important since it facilitates proper use of inputs. Visits by extension officers and other related personnel is also important to assist farmers

with technical problems that they may face. Such an arrangement will ensure that farmers use inputs and raise sufficient yield per unit area and be able to repay their loans upon sale of their produce.

Six, savings mobilisation needs to be emphasised. Savings are important for both continued circulation of funds in agricultural development and sustainability of the credit programme. This can be achieved through establishing rural based savings institutions to enable more farmers to save. Strategies should be laid such that even those farmers with relatively low incomes are encouraged to save. Through regular savings, it is possible to accumulate a substantial amount of cash. Savings mobilisation will also broaden the resource base of the established savings institutions.

Seven, since farmers' needs and activities are diverse, besides credit in kind, it is also important for credit to be provided in the form of cash. This would allow farmers to invest in other income generating activities. These will help farmers contend with the risks and uncertainty of crop production. Loans should not be for agricultural activities only.

Eight, the present SHERFSP's lending procedures should be simplified to enable timely supply of inputs to farmers. This can be achieved through re-organisation of the procedure. It is better for the procedure to end at the district level rather than the current procedure where the process reaches the regional level before the headquarters for disbursement. The district loan committee can be given a mandate to make the final loans approval.

Nine, to address the non-repayment problem, it is necessary for the SHERFSP to design more effective follow-up methods, incentives and penalties which would influence borrowers to repay their loans promptly. Such measures may include to increase the number of extension staff and provision of incentives to workers. Incentives could be in form of allowances and good transport facilities. Other measures are proper identification, selection and screening of potential borrowers. Together with the above, there is also a need for an effective monitoring of credit use through regular visits to farmers, both during production and harvesting times.

Ten, it was observed that SHERFSP loans are still accessible by the relatively well-off smallholder farmers. The SHERFSP therefore ought to consider ways of reaching the poorer farmers.

These recommendations should be taken as one package and they need to be tackled simultaneously. Implementing these recommendations can improve the effectiveness and efficiency of the SHERFSP, and hence its sustainability.

5.3 Limitations of the study and implications for further research

5.3.1 Limitations of the study

This research was limited by time and financial constraints. Given the above constraints, the scope of findings is limited to only one region, two districts, few villages and a sample of only 120 farmers. Ideally, at least one more region, out of four regions under the SHERFSP and a few more districts would have generated more conclusive results.

Furthermore, there would have been an added advantages in using data collected over the period before and after the implementation of the project, i.e. time series in contrast to the only used i.e. cross-sectional data. However, it is the contention of the author that suggestions and recommendations emanating from the study applies also to the other regions under the project, and will be viewed seriously by SHERFSP management, funding agencies and policy planners. The fact that the Southern Highlands show similarity in their production, problems and performance of SHERFSP justifies the above contention.

Data collection also has some limitation. Most of the respondents do not keep records. Thus, the accuracy of the data collected depended very much on the individual's recall capacity.

5.3.2 Areas for further research

Currently, group lending approaches have been widely used by many credit programmes, SHERFSP inclusive. The system has been suggested to be a proper means of managing recovery of loans and for reducing lending costs. However, the two aspects appear to prevail even with this approach. This study therefore has brought into focus two research issues of interest:

- (i) Further evaluation of the borrower-lender transaction costs in group lending.
- (ii) Further studies on the determinants of non-repayment in group lending.

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APPENDICES

Appendix 1: A SMALLHOLDER FARMER'S QUESTIONNAIRE

A. BASIC INFORMATION

Questionnaire number: _____

1. Date: _____ Interviewer's Name: _____

2. District: _____ Division: _____ Village: _____

3. Farmer's Name: _____ Age: _____

4. Gender: 1=Male ()
 2=Female ()

5. Marital status: 1= single ()
 2= Married ()
 3= Divorced ()
 4= Widow ()
 5= Temporary separated ()

6. Household size _____

7. Farmer's years in farming: _____

8. Farmer's Level of education:

- 1= No education ()
- 2= Adult education ()
- 3= Primary education ()
- 4= secondary education ()
- 5= Other (specify) () _____

B. CROP PRODUCTION INFORMATION

9. Do you own the entire land you are currently using for crop farming activities?
1=Yes () 2=No ()

10. If you do not own land, then whose land do you use for crop farming activities?
1=Farther's land (free use) () 2= Other relatives/friends (free use) ()
3= Hired (monetary payments) ()
4= Hired (payments in produce form) () 5= Inherited ()

11. What is the total farm size of land in acres is used for crop farming activities to the household _____

12. (a) Have you ever hired land for crop production? 1=Yes () 2=No ()

If yes, what was the rent for hiring one acre of land?. value in Tshs. _____

13. What were the major food and cash crops grown by household ?, and in average what was the volume of each crop obtained after harvest in the last two seasons?

Cash crop	1997 Acreage	Total Yield Kgs/Bags	1998 Acreage	Total Yield Kgs/Bags

Food crop	1997 Acreage	Total Yield Kgs/Bags	1998 Acreag e	Total Yield Kgs/Bags

14. What problems other than weather, is your household facing as far as crop production is concerned? (answer: 1=Yes 2=No 3= Do not know)

- Shortage of land ()
- Soil fertility ()
- Shortage of hired labour ()
- Shortage of farm inputs ()
- Shortage of extension services ()
- Lack of market ()
- High input prices ()
- Transporting crops ()
- Damages caused by crop pests ()
- Lack of capital to purchase inputs ()
- Other (specify) _____

C. HOUSEHOLD INCOME

15. Out of crop produce which ones did/do you sell, amount and at what price in the last two seasons

Crop	1997 Sacks/Kilos	Price per Kg/sack	1998 Sacks/Kilos	Price per Kg/sack

16. Are you satisfied with the amount of money you obtain from sell of crop produce?

1= Yes () 2=No ()

Reason: _____

D. OFF-FARM ACTIVITIES

18. Apart from crop farming activities, what other activities bring income into your household?, and how much did you get in the last two years?

Source of income 1=Yes 2=No	1997 Amount in Tshs	1998 Amount in Tshs
Formal employment ()		
Selling charcoal/firewood ()		
Brewing and selling local brew ()		
Carpentry ()		
Small business ()		
Brick making ()		
Masonry ()		
Others (Specify) ()		
Total		

E. LABOUR AND OTHER INPUT USE INFORMATION

19. If hired labour was used, indicate cost per operation per acre

Operation/activity	C1 Tshs	C2 Tshs	C3 Tshs	C4 Tshs
Land Preparation				
Cultivation				
Planting				
Weeding				
Harvesting				
Transporting				
Marketing				

Cs = Crops

20. (a) Did you purchase any inputs in farming?

1996/97 season 1=Yes () 2=No ()

1997/98 season 1=Yes () 2=No ()

(b) If yes, indicate the inputs, costs and the respective major crops

Crop	Inputs 1=Yes 2=No	Inputs costs
	Fertilizer	
	Seeds	
	Ox-ploughs	
	Hand hoes	
	Herbicides	
	Pesticides	

Crop	Inputs 1=Yes 2=No	Inputs cost
	Fertilizer	
	Seeds	
	Ox-ploughs	
	Hand hoes	
	Herbicides	
	Pesticides	
Crop	Inputs 1=Yes 2=No	Inputs cost
	Fertilizer	
	Seeds	
	Ox-ploughs	
	Hand hoes	
	Herbicides	
	Pesticides	
Crop	Inputs 1=Yes 2=No	Inputs cost
	Fertilizer	
	Seeds	
	Ox-ploughs	
	Hand hoes	
	Herbicides	
	Pesticides	

21. Do you remember on average how much money did you use in 1996/97 crop season for buying various inputs including hired labour

Hired labour Tshs. _____ Inputs Tshs. _____

F. SHERFSP CREDIT

22. How many times have you applied for credit in the past 4 years? and how many times were you successful in securing credit?

Times applied _____ Times received loan _____

23. If secured credit, indicate form, how much, and which season

- 1= Input form ()
- 2= Cash form ()
- 3= Both cash and input form ()
- 4= Other (specify) () _____

(a) In Cash

Season	Value in Tshs

(b) If credit was in input form, indicate specific crop, type of input, acreage planted, amount used and cost per input

Crop	Type of input	Acreage planted	Amount used	Cost per input

24. (a) Did the farmer receive the amount of credit requested?

- 1=Yes () 2=No ()

(b) If not what reasons were given by the SHERFSP for provision of the smaller amount

25. (a) State the loan repayment procedure for SHERFSP _____

(b) Indicate the amount repaid and arrears (if any)

Season	Amount repaid (Tshs /Kg or litre)	Arrears (Tshs/Kg or litre)

26. If you are in arrears give reasons

27. If you are in arrears can you still borrow from SHERFSP? Why or why not?

28 What sorts of penalties are imposed by SHERFSP for late repayment or default

29. (a) Where the loan disbursement made in time before the beginning of the season?

1=Yes () 2=No ()

(b) If not, what were the reasons given by the SHERFSP for delay? _____

30. Among the above loan disbursements which one do you prefer and is the most valuable to you?

1=Kind () 2=Cash () 3=Both cash and in kind ()
 4=None () 5=Do not know ()

Give reasons for this preference: _____

31. What was the procedure of getting loan?

List the procedure _____

32. What were the SHERFSP conditions/requirements attached to the loan taken?

33. What was the purpose for the farmer seeking credit from SHERFSP?

- 1=Consumption ()
- 2=Production ()
- 3=Both consumption and production ()
- 4=Other (specify)()

34. How long did it take from applying to getting a loan? _____(months)

35. What is the gestation period to begin payment of credit _____(months)

36. Did you incur any additional costs in getting the inputs (e.g. transportation from the depot to the farm/house) 1=Yes () 2=No ()
If yes indicate what costs and the amount

G. ASSETS AND LOAN SECURITY

37. Mention assets that you possess which can be regarded as the security for the loan to be extended? (e.g. machinery and equipment owned by the farmer, oxen, etc.)

H. FARMER'S SHERFSP CREDIT PERCEPTION AND BENEFITS

38. What is the farmer's assessment of the benefits obtained from credit use:

(i) Additional farm income (specify and explain) _____

(ii) Additional use of inputs (specify and explain) _____

(iii) Additional farm output (specify and explain) _____

(iv) Other (specify) _____

(V) No achievement (explain) _____

39. Apart from credit, what other services do you receive from SHERFSP? _____

40. What is your opinion about the efficiency of the SHERFSP in:

Delivery of inputs : _____

Ensuring credit repayment: _____

41. Do you feel that the existing credit facilities are adequate for your crop production needs? (explain) _____

42. Whom do you think has access to the SHERFSP's credit? _____

43. What problems have you faced in obtaining and using credit from the SHERFSP? _____

44. What is the farmer's general comments in regard to the SHERFSP credit service

I. OTHER CREDIT SOURCES

45. Are you aware of any other source of credit to farmers in your area?

1=Yes () 2=No ()

If yes mention them and indicate the amount received

1=National Microfinance Bank ()

2=CRDB (1996) LTD ()

3=Cooperative Union ()

4=Cooperative Society ()

5=Informal : Friends () Relatives () Neighbours ()
shopkeepers ()

6=Others (specify) _____

46. Indicate total amount of loan obtained from other sources for the past two years, at least two sources (if applicable)

No	Year	Nature 1=Cash 2=Kind 3=Both	Amount /Value in Tshs	Purpose 1=Consumption 2=Production 3=Both	Amount repaid in Tshs	Collateral
1						
2						
3						
4						

Thank you for your co-operation

Appendix 2: LIST OF QUESTIONS FOR SHERFSP

Background information

- Date of establishment
- Number of years involved in lending activities
- Targeted number of beneficiaries

Objectives

- Reasons for formation
- Documented or officially stated goals and objectives

Organisation

- Policy bodies and management structure
- Relationship with beneficiaries

Operation/services

- Criteria used in selecting farmers to be involved in the credit scheme
- Lending system and requirements to be fulfilled by a farmer
- Forms of credit
- Delivery system
- Acceptable duration of repayment of the loan issued
- Measures taken against loan non-repayers
- Number of loans issued in the past three years
- Approximate collection rate of loan issued in the past three years
- Loan performance and repayment
- Operational problems encountered in loan disbursement

Achievements :

- Group formation process and number of groups already been formed
- Number of farmers received credit service against targeted ones (todate)
- Increased use of inputs (fertilizer, seeds , chemicals)
- Increased output
- Improved input delivery system etc.

Note: Various reports and documents would be greatly appreciated

Appendix 3(a): Discriminant analysis: Probabilities and Discriminant scores for borrowers of SHERFSP credit.

Case Number	Actual Group	Highest Group	Probability P(D/G) P(G/D)		2nd Highest Group (G/D)	Discrim Scores
1	1 **	2	.9556	.8723	1 .1277	-.9561
2	1 **	2	.1475	1.0000	1 .0000	-2.9637
3	1	1	.5298	.7863	2 .2137	.2864
4	1 **	2	.6115	.5153	1 .4847	-.3526
5	1	1	.9198	.8584	2 .1416	.6516
6	1 **	2	.9373	.9296	1 .0704	-1.1354
7	1	1	.0667	.8692	2 .1308	1.9904
8	1	1	.1317	.5045	2 .4955	-.3222
9	1	1	.0390	.8484	2 .1516	2.1502
10	1	1	.2371	.6362	2 .3638	-.0970
11	1 **	2	.6493	.5625	1 .4375	-.4236
12	1	1	.2538	.6506	2 .3494	-.0686
13	1	1	.1622	.5521	2 .4479	-.2461
14	1 **	2	.7276	.6580	1 .3420	-.5656
15	1 **	2	.6493	.5625	1 .4375	-.4236
16	1 **	2	.0864	1.0000	1 .0000	-3.3187
17	1	1	.8475	.8799	2 .1201	.8544
18	1	1	.2758	.6679	2 .3321	-.0331
19	1 **	2	.8922	.8253	1 .1747	-.8496
20	1	1	.4046	.7414	2 .2586	.1444
21	1	1	.0667	.8692	2 .1308	1.9904
22	1	1	.0217	.8193	2 .1807	2.3099
23	1	1	.7681	.8853	2 .1147	.9254
24	1	1	.0143	.7940	2 .2060	2.4164
25	1	1	.7681	.8853	2 .1147	.9254
26	1 **	2	.0013	.6388	1 .3612	3.2685
27	1	1	.7681	.8853	2 .1147	.9254
28	1	1	.4649	.7653	2 .2347	.2154
29	1	1	.4494	.8985	2 .1015	1.2449
30	1	1	.9898	.8660	2 .1340	.7124
31	1	1	.9898	.8660	2 .1340	.7124
32	1	1	.0667	.8692	2 .1308	1.9904
33	1	1	.8676	.8521	2 .1479	.6059
34	1	1	.9898	.8660	2 .1340	.7124
35	1	1	.5298	.7863	2 .2137	.2864
36	1	1	.2990	.6842	2 .3158	.0324
37	1	1	.2538	.6506	2 .3494	-.0686
38	1	1	.6722	.8207	2 .1793	.4284
39	1 **	2	.6115	.5153	1 .4847	-.3526
40	1	1	.3626	.8995	2 .1005	1.3514
41	1	1	.4807	.7708	2 .2292	.2332
42	1	1	.2625	.6576	2 .3424	-.0544
43	1	1	.9898	.8660	2 .1340	.7124
44	1	1	.8275	.8467	2 .1533	.5704
45	1	1	.9285	.8594	2 .1406	.6592
46	1	1	.3111	.6921	2 .3079	.0202
47	1	1	.3311	.8994	2 .1006	1.3940
48	1	1	.5468	.8959	2 .1041	1.1384
49	1	1	.2232	.8967	2 .1033	1.5644
50	1	1	.5468	.8959	2 .1041	1.1384
51	1	1	.3185	.6967	2 .3033	.0308
52	1	1	.1474	.5302	2 .4698	-.2916
53	1	1	.5814	.8003	2 .1997	.3397
54	1	1	.0143	.7940	2 .2060	2.4164
55	1	1	.4046	.7414	2 .2586	.1444
56	1 **	2	.6686	.5864	1 .4136	-.4591
57	1	1	.1622	.5521	2 .4479	-.2461
58	1	1	.2136	.6136	2 .3864	-.1396
59	1	1	.6170	.8932	2 .1068	1.0674
60	1	1	.7681	.8853	2 .1147	.9254
61	1	1	.0058	.7258	2 .2742	2.6295
62	1	1	.0323	.8397	2 .1603	2.2034
63	1 **	2	.0013	.6388	1 .3612	3.2685
64	1	1	.4192	.8990	2 .1010	1.2804
65	1	1	.3626	.8995	2 .1005	1.3514
66	1	1	.9898	.8660	2 .1340	.7124
67	1	1	.8878	.8769	2 .1231	.8189
68	1 **	2	.0150	1.0000	1 .0000	-4.2772
69	1	1	.8878	.8769	2 .1231	.8189
70	1	1	.8475	.8799	2 .1201	.8544
71	1	1	.8878	.8769	2 .1231	.8189

Source: Analysis from survey data, 1998/99.

Appendix 3(b): Discriminant analysis: Probabilities and Discriminant scores for non-borrowers of SHERFSP credit.

Case Number	Actual Group	Highest Probability Group	P(D/G)	P(G/D)	2nd Highest Group	P(G/D)	Discrim Scores
72	2 **	1	.8275	.8467	2	.1533	.5704
73	2	2	.0061	1.0000	1	.0000	-4.6926
74	2	2	.8220	.9663	1	.0337	-1.3307
75	2	2	.9980	.8981	1	.1019	-1.0271
76	2	2	.1629	1.0000	1	.0000	-2.8927
77	2 **	1	.1474	.5302	2	.4698	-.2816
78	2	2	.0476	1.0000	1	.0000	-3.6737
79	2 **	1	.5298	.7863	2	.2137	.2864
80	2 **	1	.8075	.8438	2	.1562	.5527
81	2 **	1	.2232	.8967	2	.1033	1.5644
82	2 **	1	.5468	.8959	2	.1041	1.1384
83	2	2	.9091	.8388	1	.1612	-.8780
84	2	2	.0230	1.0000	1	.0000	-4.0642
85	2	2	.6115	.5153	1	.4847	-.3526
86	2 **	1	.6910	.8897	2	.1103	.9964
87	2 **	1	.1622	.5521	2	.4479	-.2461
88	2	2	.8503	.7886	1	.2114	-.7786
89	2	2	.0686	1.0000	1	.0000	-3.4607
90	2	2	.0507	1.0000	1	.0000	-3.6382
91	2	2	.6616	.9899	1	.0101	-1.6147
92	2	2	.0476	1.0000	1	.0000	-3.6737
93	2	2	.0686	1.0000	1	.0000	-3.4607
94	2	2	.0139	1.0000	1	.0000	-4.3127
95	2	2	.3191	.9998	1	.0002	-2.3602
96	2	2	.3063	.9998	1	.0002	-2.3957
97	2	2	.6115	.5153	1	.4847	-.3526
98	2 **	1	.5298	.7863	2	.2137	.2864
99	2	2	.2819	.9999	1	.0001	-2.4667
100	2	2	.6493	.5625	1	.4375	-.4236
101	2 **	1	.2136	.6136	2	.3864	-.1396
102	2 **	1	.5298	.7863	2	.2137	.2864
103	2	2	.0062	1.0000	1	.0000	-4.6819
104	2	2	.1629	1.0000	1	.0000	-2.8927
105	2	2	.0420	1.0000	1	.0000	-3.7447
106	2 **	1	.2136	.6136	2	.3864	-.1396
107	2 **	1	.9898	.8660	2	.1340	-.7124
108	2	2	.3594	.9996	1	.0004	-2.2537
109	2 **	1	.3493	.7145	2	.2855	-.0734
110	2	2	.1200	1.0000	1	.0000	-3.1057
111	2 **	1	.8275	.8467	2	.1533	.5704
112	2 **	1	.5298	.7863	2	.2137	.2864
113	2 **	1	.3235	.8994	2	.1006	1.4047
114	2	2	.8089	.7480	1	.2520	-.7076
115	2	2	.7276	.6580	1	.3420	-.5656
116	2 **	1	.2990	.6842	2	.3158	-.0024
117	2	2	.2588	.9999	1	.0001	-2.5377
118	2	2	.3594	.9996	1	.0004	-2.2537
119	2	2	.0046	1.0000	1	.0000	-4.8097
120	2	2	.0346	1.0000	1	.0000	-3.8512

Source: Analysis from survey data, 1998/99

Group centroids (canonical discriminant function evaluated at group means):

** Respondent not belonging to the same group 19.7% and 36.7% for borrowers and non-borrowers respectively.

Appendix 4: SHERFSP 's LOAN APPLICATION FORM ²

(Groups/Savings and credit)

(Three copies to be filled)

A. For office use only

ENTERPRISE OFFICE _____ _____	NAME AND ADDRESS OF APPLICANT _____	DATE OF RECEIVING APPLICATIONS _____
WARD/VILLAGE _____	_____	AMOUNT OF LOAN APPROVED _____
DISTRICT _____	_____	INTEREST RATE _____
REGION _____	_____	DATE OF APPROVAL _____

B. ENTERPRISE INFORMATION/LOAN APPLICATION**1. Qualifications of applicants/Group members/members savings and credit***

Name of the group -----

Registration number -----

Names of group members**	Gender	Marital status***	Major crops and acreage grown by group members/household	Average yield
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----

N.B * Savings and credit societies should attach list of members that are supposed to receive loans together with a copy of registration of the society.

** If the number of group/society members is larger, attach list with application forms

*** Marital status: show clearly whether you are married, not married (women) but you have dependants.

² This form is a translation from "swahili" version

C. SUGGESTED LOAN REPAYMENT PROCEDURE

1. Loan will be repaid as follows:
(Put a tick where appropriate)

- (a) After one season (b) annually (c) Semi-annually
(d) Quarterly (e) Monthly

2. Interest rate

Loan will be charged an interest rate of ----- per annum.

D. APPLICANT RESOURCES

1. Group/society will has contributed/will contribute Tshs. ----- to suffice with the cost of the enterprise of which loan application is meant.

2. Group/society has savings in a bank of Tshs. ----- in the account number ----- branch (name of the branch) -----of (name of the bank) -----

3. Group/society has a total of in hand of Tshs. -----

4. Group/society is expecting repayment from other groups/societies of Tshs. -----

5. Group/society is expecting to repay Tshs. ----- to other groups/societies

E. APPLICANTS DECLARATION

The undersigned, confirms on behalf of all group/society members that permission has been granted by the Group/society to apply for this loan according to the summary of minutes No.----- of the group/society' meeting that took place on (date) ----- and that information provided above are true, and that it is illegal to provide false information about this enterprise/application, and that SHERFSP has every mandate in the supervision of implementation and performance of the enterprise and repayment if loan would be granted. That contract forms will be signed by the concerned without delay, and that group/society as a borrower is responsible to pay back all loan received.

FULL NAME	DESIGNATION	SIGNATURE	DATE
-----	Chairman	-----	-----
-----	Secretary	-----	-----
-----	Treasurer	-----	-----

STAMP OF CROUP/SOCIETY -----

F. DECLARATION FROM SUPERVISORS/ADVISORS

1. Community development Officer/Assistant of the village/ward/division

I ----- (Full name) as a Community Development Officer/assistant of village/ward/division ----- recognise group/society ----- (name of the group/society) and that I was involved in the preparation and advise group/society members and that it is able to implement and administer efficiently the enterprise of which loan was sought.

Name ----- Designation -----
Signature ----- Date -----

2. Village government

We as a village government leaders of ----- (name of the village) recognise a group/society ----- (name of a group/society) and believe that it is able to implement and administer efficiently the enterprise of which loan was sought.

Name ----- Designation -----
Signature ----- Date -----

STAMP OF THE VILLAGE GOVERNMENT -----

Appendix 5: SHERFSP 's LOAN CONTRACT FROM ³

1. This contract has been signed (date) ----- between SHERFSP of post office box number ----- as a lender and ----- of post office box number----- as a borrower.

2. THE FOLLOWING AGREEMENTS HAVE BEEN REACHED

THAT: SHERFSP (lender) has agreed to provide loan amounting to Tshs.----- (in words-----to ----- (borrower). This loan of Tshs.----- will be used as follows:

Activity	Cost
1.-----	-----
2.-----	-----
3.-----	-----
4.-----	-----
5.-----	-----

THAT: Borrowers is required to pay back this loan of Tshs.----- together with interest rate of 26.5% per annum in a period not exceeding ----- months from ----- and that all loan must be already paid by ----- (date).

BORROWERS DECLARATION

We, signed on behalf of ----- (borrower) agree with conditions of this loan. We promise to execute all conditions of this loan and repay loan as it has been expressed in this loan contract collectively as a borrowers of this loan. If we fail to repay this loan we will oblige with any legal actions that will be taken against us including liquidation of group assets and individual borrowers assets to compensate for loan arrears to the lender.

³ This form is a translation from "swahili" version

This agreement has been reached and signed by:

Name	Designation	Signature
-----	-----	-----
-----	-----	-----
-----	-----	-----
-----	-----	-----

On one hand (borrower) of post office box ----- in presence of

Name -----
Designation -----
Signature -----
Date -----

On behalf of SHERFSP of post office box ----- on the other hand.

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Appendix 6: Illustrations on problems of autocorrelation, multicollineality, homoscedasticity and heteroscedasticity.

The regression results obtained for this study indicates that there was no serious problem of autocorrelation as suggested by the value of Durbin Watson (DW). The value of DW was 1.908 at the 5% level. Using the DW standard tables, the above value provided evidence that problem of serial correlation was minimal since the value was greater than the upper value (The DW's lower and upper values were 1.55 and 1.85 respectively. Intercorrelation between the independent variables (multicollineality) was also found to be not seriously violated in this analysis. This was taken care by looking at the values adjusted R square and F-ratio which were found to be significant, and the correlation matrix of which partial correlation coefficients between variables were not seriously higher ($r_{ij} < 0.8$) as presented in Table 6.1.

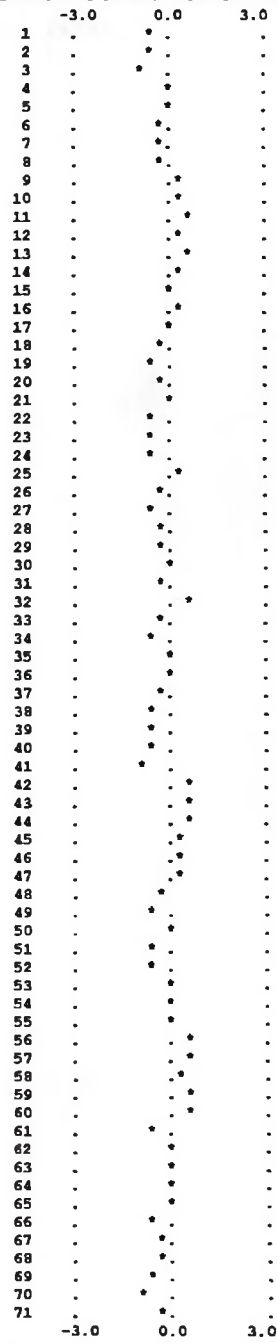
The normality assumption was taken care by plotting the observed and residual distributions against each other for a series of points. The casewise plot of standardised residual obtained appears in the Table 6.2. The observed values run close to the expected straight line, which suggests that normality assumption was adhered to. This results suggest that the linearity and homoscedasticity assumptions were not seriously violated. The problem of heteroscedasticity was taken care by employing a log-linear regression equation.

Table 6.1. Correlation Matrix of the independent variables.

	ACASHOFA	ACREAGE	AVECHLB	EDUCAT
ACASHOFA	1.0000 (120)	.1382 (120)	.3101 (120)	.1820 (120)
ACREAGE	.1382 (120)	1.0000 (120)	.3582 (120)	-.0244 (120)
AVECHLB	.3101 (120)	.3582 (120)	1.0000 (120)	.0565 (120)
EDUCAT	.1820 (120)	-.0244 (120)	.0565 (120)	1.0000 (120)
EXPFARM	.0062 (120)	.3517 (120)	.0048 (120)	-.2754 (120)
INFOSHP	.1664 (120)	.0605 (120)	.1661 (120)	.0353 (120)
INPUTEXP	-.2776 (120)	.4177 (120)	.4414 (120)	-.1304 (120)

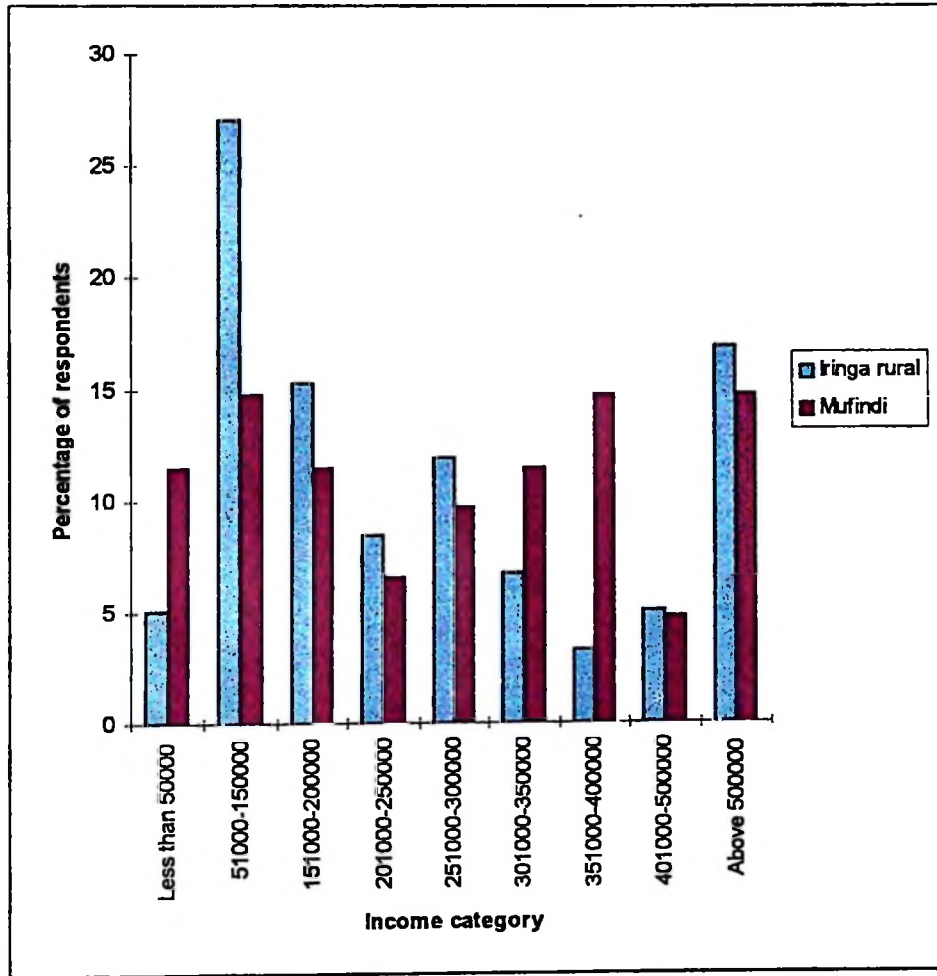
Source: Analysis from Survey data, 1998/99.

Table 6.2. Multiple regression: Casewise Plot of Standardized Residual



Source: Regression analysis procedure on survey data, 1998/99.

Appendix 7: Iringa Rural and Mufindi Districts: Distribution of total income of the sampled farmers (in Tshs).



Source: Survey data, 1998/99.

SPE