FINANCE IN SMALL-HOLDER AGRICULTURE IN THARAKA, EASTERN KENYA:

A Case Study of Small-Farm Finance

by

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Research Paper submitted to the Department of Economics, University of Nairobi, in Partial Fulfilment of the Requirements for the Degree of Master of Arts in Economics

June 1976

This research paper is my original work and has not been presented for a degree in another University.

GERMANO MWIGA MWABU

This research paper has been submitted for examination with our approval as University Supervisors.

PROF. MARTIN DAVID

PETER WYETH

ACKNOWLEDGEMENTS

I owe gratitude and thanks to Prof. Martin David and Dr. Peter Wyeth who were my supervisors in this study. Their instructive and generous assistance is gratefully acknowledged.

I am also indebted to Prof. W.M. Senga, the Post-Graduate Adviser in Economics at University of Nairobi, for his all round encouragement during the course of this study. He was always a source of inspiration at the critical moments.

To my graduate student colleagues at the University of Nairobi, I must also say thank you. In particular I am thankful to Messrs. Peter Kiko Kimuyu, Gilbert Magiri, J. Obiri and Thomas Kibua who assisted me in many ways in the preparation of this dissertation.

I also found steady assistance outside the University for which I am very grateful. This particularly came from Mr. Dennis Brooks of U.N.E.P., who gave me encouragement and guidance during the formulation stage of this study.

This study was made possible by the Rockefeller Foundation who gave me a generous scholarship to study Economics at the University of Nairobi. To Rockefeller Foundation, I say thank you very much.

Thanks are also due to Tharaka Farmers who patiently gave up their time to provide me with farm data for this study.

My final and most grateful thanks go to Mehrun Ramji, Department of Sociology, University of Nairobi for her careful typing of this dissertation.

ABSTRACT

Agricultural development is not just a sustained rise in farm productivities. It means an overall growth in farm output accompanied by: (1) a more equitable farm income distribution, (2) an increasing productive farm employment and (3) and rising stock of a farmer's farming skills.

Credit is being used to bring about agricultural development in Kenya.

The concern with this study was to find out whether farm credit will bring about agricultural development in Kenya. This was done by conducting an empirical study of farm credit in a rural area in Kenya.

The main finding of the study is that credit, especially in-kind credit, will raise overall agricultural productivity in Kenya. It has also been found that cooperative societies are the most suitable institutions of channelling credit to small farmers.

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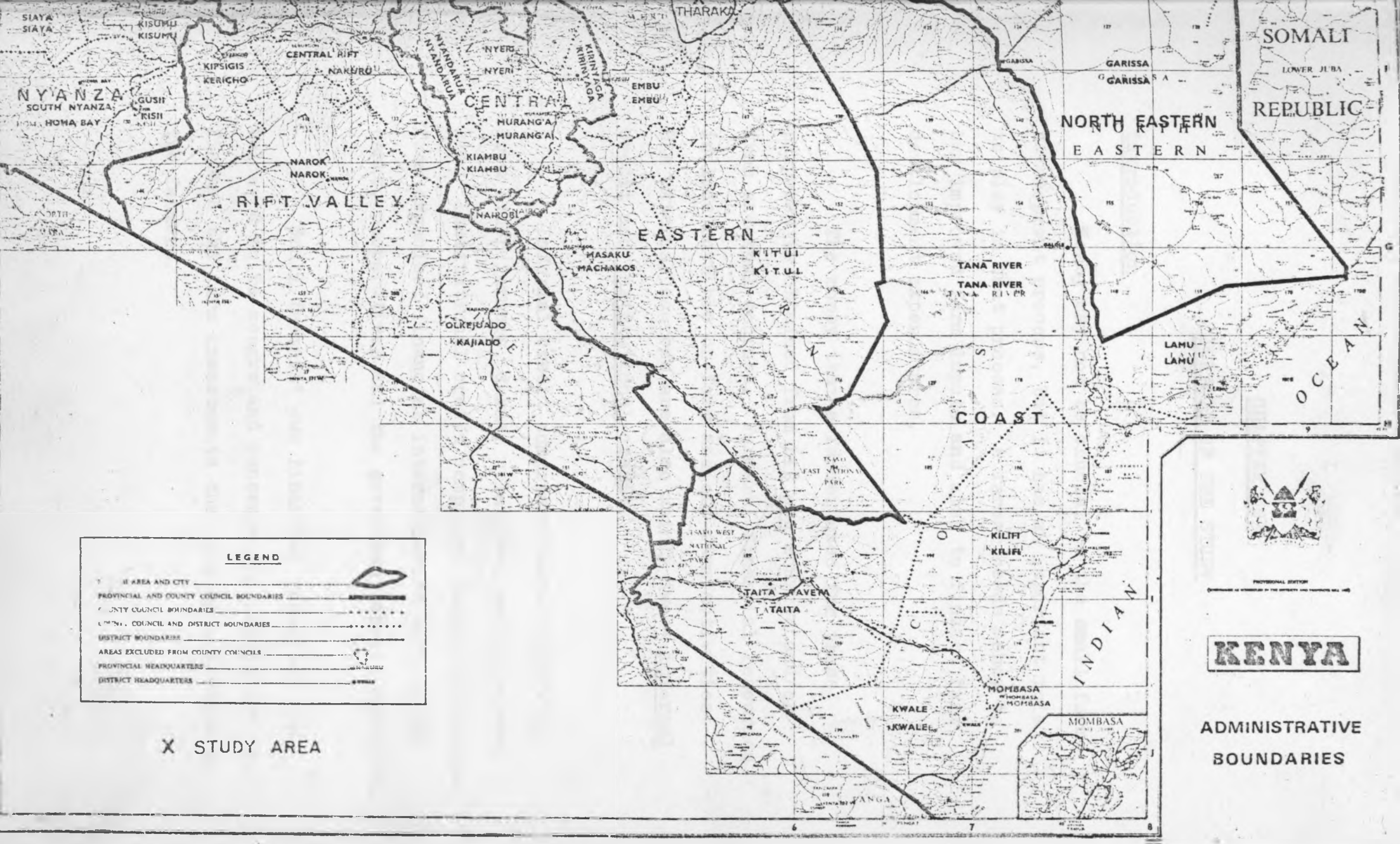


LEGEND

- [illegible] AREA AND CITY
- PROVINCIAL AND COUNTY COUNCIL BOUNDARIES
- [illegible] COUNTY COUNCIL BOUNDARIES
- [illegible] COUNCIL AND DISTRICT BOUNDARIES
- DISTRICT BOUNDARIES
- AREAS EXCLUDED FROM COUNTY COUNCILS
- PROVINCIAL HEADQUARTERS
- DISTRICT HEADQUARTERS

X STUDY AREA

PROVISIONAL EDITION

KENYA

ADMINISTRATIVE BOUNDARIES

CHAPTER ONE

PURPOSE OF THE STUDY

Introduction

Money may not be crucial to the small farm development process, but it has an important role to play in that process. A farmer needs money to buy improved farm inputs and also to finance farm development expenditures.

The money that a farmer uses for these purposes is obtained from his own sources and/or from external sources. Farmers' financial resources include both his on-farm and off-farm activities. His external sources are also mainly two - informal credit and institutional credit.

Informal credit comprises farmer borrowings from other farmers, dukas, relatives, money lenders, etc. Institutional credit comprises farmer borrowings from organised financial intermediaries such as the banks, cooperatives and the government credit agencies.

Small farmers' own financial resources are believed to be meagre and consequently inadequate to finance the farm investments that may be available to the farmers.

It is this belief that has led to the efforts to supplement the apparently meagre internal funds of smallholders with credit in a bid to increase their output and incomes. Such efforts have met with more failures than successes. Small farm credit has been found in the majority of cases to be ineffective in inducing increases in farm output and incomes. Repayment has also been found to be a bother to the majority of farmers. Administration by the credit granting agencies is rated as very difficult.

Economists have given many and differing reasons for the failures of small farm credit. It has been argued that credit Programmes do not succeed because they do not reach the farmers who need credit and that credit is given when it is not necessary.

One way of ensuring that credit reaches the small farmers who are usually widely distributed over a diverse geographical area, it is argued, is to use a cooperative society as the credit giving and administering agency. The principal strength of the cooperative society as a credit agent is its day-to-day contact with loanee farmers through its membership systems. Such accessibility enables the cooperatives to provide convenient extension and marketing services

which complement a credit programme.

The major flaws in channelling credit to small farmers through cooperative societies are that they are highly susceptible to corrupt practices at the local level and also that their management is not efficient enough to provide the necessary services to the large numbers of farmers they deal with.

For example, cooperative credit to farmers is predominantly given in kind. Because of poor management, the cooperative societies frequently find that they cannot deliver inputs on time and in the quantities required.

The ideas presented above are examined more closely in an empirical study of small farm finance in one of Kenya's rural areas. The data for this study is derived from a sample of smallholdings in Tharaka division of Meru district, Eastern Kenya. 52 farmers who had received loans from the Meru Cotton Growers' Cooperative Society were interviewed to determine their experience and attitudes towards farm investments and credit.

Research Objectives

This study was undertaken for several reasons:

(a) To investigate the extent to which there exists unsatisfied demand for viable farm investments in the study area.

(b) To identify the non-institutional sources of smallholders' finance in the study area and their importance in relation to institutional finance for farm investment expenditures.

(c) To consider the main constraints that limit the extent to which the cash resources of small farmer can be invested in farming.

(d) To examine alternative uses of cooperative credit in kind in the study area apart from its present use for financing cotton spraying.

(e) To investigate whether credit in kind in the study area is being used exclusively for the purpose for which it is given.

(f) To ascertain the attitudes of farmers towards the cooperative credit in kind and the basis

for such attitudes.

(g) To investigate whether credit in kind has had a positive impact on the welfare of the farmers in the study area.

The Problem

The majority of Kenya's population lives in the rural areas and derives its livelihood predominantly from small scale agriculture. The standard of living of this population, measured in terms of farm output (income) that is available for consumption and re-investment is below the national average.[1] Yet, possibilities exist for raising productivities in Kenya's rural agriculture. If small-scale farmers can acquire and use more efficient farm equipment, adopt high yielding farm inputs (improved seeds, fertilizers, insecticides, etc) and are provided with a market for their surplus farm output, their farm productivities will rise, and their standards of living will rise concomitantly.

Credit in kind or in cash, can be used to enable farmers acquire modern farm equipment (ploughs, small tractors, ox-carts, spray pumps, etc.) along with farm inputs that increase productivity. Credit

can also be linked with a marketing facility to motivate farmers increase their marketable output. In this way, rural incomes and standard of living would be increased.

The overall concern of this research is to measure the impact of credit on small farm incomes and investments in a rural area in Kenya, with a view of evaluating whether credit can be used to accelerate small farm development and improve living conditions of the majority of Kenyans.

In this endeavour, a number of hypotheses pertaining to farm finance and the cooperative society as a vehicle of channelling credit to small farmers will be tested.

The Hypotheses

A hypothesis is a theoretical proposition made on *a priori* ground(s) about a phenomenon. A hypothesis is capable of being proved wrong or right by confronting it with real life facts. An important aspect of a hypothesis is that it is *not* a statement that is true by definition.

If a theoretical proposition about a phenomenon approximates to real life facts of that phenomenon, it is accepted on the basis of those facts. If it does not, it is either rejected or no judgements are passed as to whether it is right or wrong.

Empirical evidence is the data about a real life situation that can be used to test the validity of a hypothesis.

The hypotheses of this research were constructed on the basis of prior knowledge of the role of finance in smallholdings in Kenya. These hypotheses are :

Those related to utilization of small farmer funds

(1) The bottleneck in small farm development is lack of finance.

(2) New farm investments cannot compete with existing farm projects for small-farmer self-financing.

(3) Transactions demand to hold cash by the rural smallholders is the major constraint limiting the investment of funds in farming.

Those related to the cooperative credit in kind

(4) Cooperative credit in kind causes misallocation of smallholders' resources because it lowers production costs of some crops and not others.

(5) Farmers will respond to the shortages and delays in credit inputs in kind by taking excessive amounts of these inputs when they are available and stockpiling the surplus.

That related to the cooperative societies

(6) Credit Cooperative Societies do not fill the gap in farmers' credit needs because they are poorly managed.

The following conclusions will be made after the above hypotheses have been tested.

If hypotheses two and three are correct, we may conclude that there is a need for external finance in Kenya's small farms. Acceptance of hypothesis one

will lead to the conclusion that credit can alleviate financial constraints in smallholder agriculture in Kenya and accelerate their development. Rejection of hypothesis one will lead to rejection of hypotheses two and three and it will be concluded that lack of finance is not a constraint on small farm development in Kenya.

Hypotheses four and five are meant to test whether in-kind credit has disadvantages. Acceptance of these hypotheses leads to the conclusion that in-kind credit should be used cautiously because its disadvantages limit productivity gains from farm investment. Rejecting these hypotheses implies that caution in the use of in-kind credit is not necessary.

Hypothesis six tests whether the management of the cooperatives determines in any significant way, the effectiveness of cooperative credit to farmers. Its acceptance will mean that the management of the cooperatives should be improved as a prerequisite to the effectiveness of the cooperative credit. Its rejection will lead to the conclusion that management of the cooperatives is not crucial to the success of the credit that they extend to smallholders.

Organisation of the Text

We conclude this chapter with a few remarks about the organisation and content of the rest of the chapters.

Chapter two describes the methodology of this research. The chapter starts with a discussion of how the sample of farmers who provided data for this study was selected, the weaknesses of the sample as selected are identified, and techniques used to analyse the data are briefly presented.

The chapter ends with a presentation of models used to evaluate the role of credit in small farm development. Basically, the models seek functional relationships between: (a) credit and farm output (income), and (b) credit and farm investments.

In chapter three, we describe the area in which the fieldwork for this study was conducted and also present a definition of "small farms" that we think is theoretically sound and has a practical relevance for Kenya.

Chapter four examines the meaning and functions of finance, looks at the state of small farm finance in Kenya and closes with a review of previous studies that are relevant to this study.

Chapter five presents the results of the fieldwork. These results are presented in form of tables. The tables present information about:

(a) Various characteristics of sample farms, which include among many others, period for which they have been under cultivation, asset structures, crops grown, livestock kept and their sizes.

(b) Non-credit finance in sample farms.

(c) Credit funds.

(d) Use of in-kind credit.

(e) Obstacles to the development of sample farms.

(f) Farmer attitudes towards cooperative credit and the cooperative society as an institution.

Chapter six presents computer solutions of the models used in this study.

On the basis of these results and the data in chapter five, conclusions pertaining to the research

hypotheses are made. Some of the major conclusions arrived at are that credit in kind has a crucial role in the development process of small farms, that cash credit has a limited role (if any) in this process and that cotton production in the study area depends almost exclusively on the in-kind credit extended by a cooperative society.

The seventh and final chapter concludes this study in three sections. The first section reviews the extent to which the objectives of this research have been achieved, the second puts forward proposals for development arising from this study. The third and final section presents the implications of this study for Kenya's agriculture.

Chapter seven is followed by appendices and a bibliography.

The appendices section begins with the questionnaire that was used to collect data for this study.

CHAPTER TWO

METHODOLOGY

The data for this study were collected by administering a questionnaire to individual farmers in a randomly selected sample. The questionnaire was constructed in a way that made it possible to gather data about the following aspects of the sampled smallholdings:

(a) The size and economic status of farm households;

(b) Farm operations, assets, projects and investments;

(c) Sources of non-credit finance for the farms;

(d) Obstacles to farm investments;

(e) Use of the cooperative credit in kind by the farms and other institutional credit;

(f) Farmers attitudes towards cooperative credit and the cooperative society itself;

(g) Cooperative credit and the rural farm welfare.

Sample Selection

The sample farms were selected at random from the records of the loan office of the Meru Cotton Growers' Cooperative Society at Nkondi - the study area.

In every major cotton producing area in Meru, the Meru Cotton Growers' Cooperative Society has a loan office and a loan clerk who keeps records of loans of spray-insecticides and cotton pumps to farmers borrowing such materials.

A list of all farmers who had borrowed insecticides and/or cotton pumps from the Meru Cotton Growers' Cooperative Society (M.C.G.C.S. Ltd.,) Nkondi loan office, during the previous crop season (October, 1975 to March, 1976) was compiled. The list included a total of 228 farmers, distributed in various parts of the study area. Each loanee farmer in the study area was given an equal chance of being included in a small sub-sample. Lack of time and resources made it impossible to interview all loanee farmers.

Sub-sampling was done by making a systematic selection from the list. Every fourth loanee farmer, beginning from loanee farmer number one, was picked from the list of loanee farmers at the Nkondi loan office. In this way, a sample of 57 farmers was selected that constituted about 25% of all loanee farmers in the study area.

As is often the case with studies that involve field work, not all the farmers who fell into the sample provided data for this study. Two of the 57 farmers could not be traced anywhere in the study area and they were consequently not interviewed. One of the sample farmers had mental disturbance and he was also not interviewed. Two of the questionnaires that were finally filled up, were lost in transit between the field work station and Nairobi University where the data were analyzed and results written up.

This attrition reduced the sample farmers to 52, a size that represented about 23% of all loanee farmers in the study area.

Limitations of the Sample

The sample excludes two groups of the farmers in the study area: (1) those farmers who do not grow cotton at all, and therefore did not borrow cotton insecticides or cotton pumps and did not appear in the cooperative society's list of loanee farmers (2) those farmers who grow cotton but did not take input credit in any form from the cooperative society during the October 1975/March 1976 crop season.

The number of the first group is large. During the 1969 Census, there were 963[2] male adults in Nkondi and at the time the survey was conducted, the figure was definitely well over 1,000 due to the natural population growth in the area and in-migration.

Assuming most of the male adults in the study area are heads of households and they each own a farm, the total number of farmers at Nkondi can, with a fair degree of accuracy, be estimated at a conservative figure of 1,000. This being so, the number of farmers from which the sample for the study data was chosen represented about one-quarter of the total farming heads of households in Nkondi. Since ideally, the sample should always be chosen with the objective(s) of the study in mind, it was justifiable in the case

of this study to leave out that section of Nkondi population that could not provide data on institutional credit.

The second group of farmers however, those who grow cotton and did not receive credit from the cooperative society during the previous season, should have been given a chance of being included in the sample. Their information would definitely have been useful for the study purposes. Their number was estimated at around sixty and about fifteen of them would have been in the sample if they were given a chance of being sampled.

Despite this, their exclusion from the sample frame does not affect the reliability that can be placed on the data collected from only those farmers that were sampled from the cooperative society's records. These farmers provided data for both external and internal sources of finance of Nkondi farmers - the information that was critical for the purposes of this study.

The Models

(1) Definitions of Variables: The most critical variables in the models that follow are: farm investment and farm income.

Farm investment is defined to include expenditures on (a) farm equipment (ploughs, ox-carts, jembes, spray pumps, etc.). (b) farm fence expenditures and (c) expenditures in livestock sheds. All the expenditure figures included in the variable "farm investment" were made between 1962 and March 1976.

Farm income is defined to include proceeds from cash and food crops. Income from any other source(s) is not included in this variable. The variable "Farm Income" is a flow. It is a total of incomes derived by sample farmers from sales of food and cash crops during the agricultural year ended March 1976.

The above two variables are regarded as critical for the following reasons: Farm investments are linked with farm technology. If a farm has a large stock of equipment e.g. ploughs, land master tractors, ox-cart etc. it means that it has a technology that gives it the capability of producing more

than a farm that has only traditional tools. An increase in a farm's investment stock means an increase in its capability or capacity to produce more.

Farm income on the other hand is linked with the market for marketable farm output. If a farm produces surplus output, for which there is a market, its farm income will increase.

Other variables that will be used and need to be defined are the following:

(a) Small farmer <u>own funds</u>. These include incomes from self-employment, wage employment, remittances from relatives or friends, and proceeds from sunflower and food crops. Proceeds from cotton sales are not included. Since the models are meant to measure the effects of cooperative credit on farm investment and incomes, inclusion of cotton proceeds in the variable farmer's "own funds" would introduce the problem of multicollinearity because in the models <u>farm investment</u> is regressed on cooperative credit and farmers own funds.

(b) Management: This is a variable in one of the income models. The reason for creating a management variable is that it is thought that a farmer who manages his farm well will have a higher income than the farmer who manages his farm badly. A farmer is considered a good manager if he has plans of what he wants to do in his farm over the next season and if in addition to that he practices water conservation on his farm. Lack of water is a big problem in the study area and it is thought that a good farm manager should take note of that and try to conserve it on his farm. A farmer who has farm plans and conserves water on his farm gets a score of 2 in the model where the management variable appears. A farmer who conserves water on the farm but does not plan for future farm activities is considered a fair manager and he is given a score of 1 in the models. Similarly, a farmer who plans for the future farm projects but does not practice water conservation on the farm is considered a fair manager is given a score of 1. A farmer who does neither of these two, he is assessed as a bad manager and is given a score of zero.

(c) Other credit: is defined as cash credit that a farmer gets from other farmers, relatives, banks, etc.

(d) Farmer Education: is measured by years of schooling. The variable has been scaled as follows:

1. for any years spent in primary 1 to 4;
2. for any years spent in primary 5 to 7;
3. for any years spent in Forms 1 to 4;
4. for any years spent in school after Form 4.

(2) The Regression Equations:

(i) Farm investment function:

$$FI_i = K + dC_{pi} + d_1C_{0i} + d_2FO_i + E_i$$

where:

i = ith observation and runs from 1 to 52
FI = farm investment
K = a constant
C_p = cooperative credit in kind
C_0 = other credit
F_0 = farmer's own funds
E = other influences on FI that are not explained by the model.

The objective of the above equation is to measure the impact of farmer's own funds and external funds that he obtains through credit on his farm investment.

(ii) The Farm Income Functions:

$$Fy_i = A + aC_{pi} + a_1FI_i + a_2F_{ei} + E_i$$

where:

i	=	ith observation and runs from 1 to 52
Fy	=	farm income
A	=	a constant
C_p	=	cooperative credit in kind
F_i	=	farm investment
F_e	=	farmer education
E	=	other influences on (F_y) not included in the model

The purpose of the above model is to compare the relative effects of cooperative in kind credit and other factors - notably education and investment on farm income.

$$Fy_i = Q + bC_i + b_1G_i + b_2Z_i + b_3S_i + b_4A_i + b_5M_i + E_i$$

where:

i = ith observation and runs from 1 to 52
Fy = farm income as defined
Q = a constant
C = cotton acreage
G = greengrams acreage
Z = maize acreage
S = sorghum and millet acreage
A = sunflower
M = management variable

The purpose of the above equation is to measure the relative marginal contributions of various crops to farm income by using acreages of those crops as proxies for their output. The influences of management on incomes will also be investigated.

(iii) Cotton Acreage Function:

$$CA_i = \alpha + hC_pi + h_1FO_i + E_i$$

where:

i = ith observation and runs from 1 to 52
CA = cotton acreage
α = a constant
C_p = cooperative in kind credit
F_O = farmers own funds

The purpose of this model is to measure the relative effects and magnitudes of credit in kind and farmer's own funds on cotton acreage. The economic rationale of the model is that if a small farmer's own funds are inadequate to meet costs of cotton production, external assistance in form of credit to produce cotton should, *ceteris paribus*, enable him to expand cotton production.

The regression solutions of the above equations will be presented in chapter six and will be used along with other data collected pertaining to the sample farms to test the hypotheses of this research.

CHAPTER THREE

LOCATION OF THE FARM SURVEY

The data on which this study is based was collected in Tharaka - a divisional administrative unit in Meru district, Eastern Kenya.

Tharaka is one of Kenya's marginal areas. It lies only 21' South of the Equator and between longitudes $37^{o}45'$ and $38^{o}15'$ East of Greenwich.[3] ? 2°S?

Its altitude ranges from about 1,800 ft. to about 3,000 ft. above the sea level with exception of a few isolated hills that are above 3,500 ft. Tharaka annual rainfall is low (25"-30" p.a.) and unevenly distributed. "Long rains" fall from March to May and the "short rains" begin in October and end in January. The temperatures are high both during the day and night and their annual mean is around $80^{o}F$.

Tharaka is sparsely populated. Its inhabitants were about 37,000 people during the 1969 Census and occupied 1,414 square kilometres. Population distribution of Tharaka is uneven with heavy concentrations in its two settlement schemes. Population density is about 26 persons per square kilometre.[4]

The main economic activities in this area are crop growing and animal rearing. Animal rearing however seems to have been overtaken by crop cultivation over the recent past because of ever increasing pressure for more food as a result of a rapidly expanding population. Cattle rearing in Tharaka today cannot compete with crop cultivation for any given piece of land.

Because of time constraint, the data for this study were not collected from the whole of Tharaka The farm survey covered only one location in Tharaka, viz., Nkondi. Nkondi is the site of one of the two settlement schemes in Tharaka.

Given the objective of the study, the choice of Nkondi for field work was obvious. Nkondi is the leading seed cotton producer in Tharaka and it ranks fourth as the most important producer of this crop in Meru district (12). For this reason, Nkondi farmers get substantial credit in kind from the Meru Cotton Growers Cooperative Society to enable them expand their cotton production. It was therefore thought that this area would provide adequate and useful data on external funds of small farmers.

Nkondi is the smallest sublocations of Tharaka division and the most densely populated. Its population density is 2.3 times higher than the divisional average. It was again thought that this was the appropriate place to seek data on farm investments, output and incomes. The third reason for which Nkondi was chosen to set up the field work project is that most of the location is surveyed and farmers know their plot acreages well.

The fourth and final reason why the field work was conducted in Nkondi is that it is quite typical of many low potential areas in Kenya where crop cultivation is important. It was therefore thought that findings based on Nkondi data could be generalized to other low potential areas of Kenya.

The data were collected by personal interviews by the author and two field assistants during the months of March and April.

The Small Farms or Smallholdings

To avoid confusion in the analyses that follow, we make it clear in this section, what we mean by small farms.

In Kenya, there is no generally accepted definition of small farms. The definition of small farms in Kenya varies with the author and the purpose for which the definition is sought.

The Agricultural Finance Corporation (A.F.C.) defines small farms as those which earn an annual gross farm income of less than Shs. 10,000/- or those whose size does not exceed ten acres. To be sure, this is an operational definition, suitable largely for the loan purposes of the A.F.C. It is supposed to guide the A.F.C. in deciding the size of the loans that it extends to farmers so that a farmer is not given a loan that is beyond his ability to repay.

There are at least two things wrong with the A.F.C. definition of small farms. (1) the definition is arbitrary. A small farm which is under 10 acres can intensify its farm activities and be able to earn a gross farm income of more than Shs. 10,000/-. Similarly, a large farm which is well over 10 acres could be mismanaging itself and never be able to earn an annual gross farm income of Shs. 10,000. It would therefore continue to qualify as a small farm while in fact it is not. This definition cannot be a guide as to which farms are using their resources

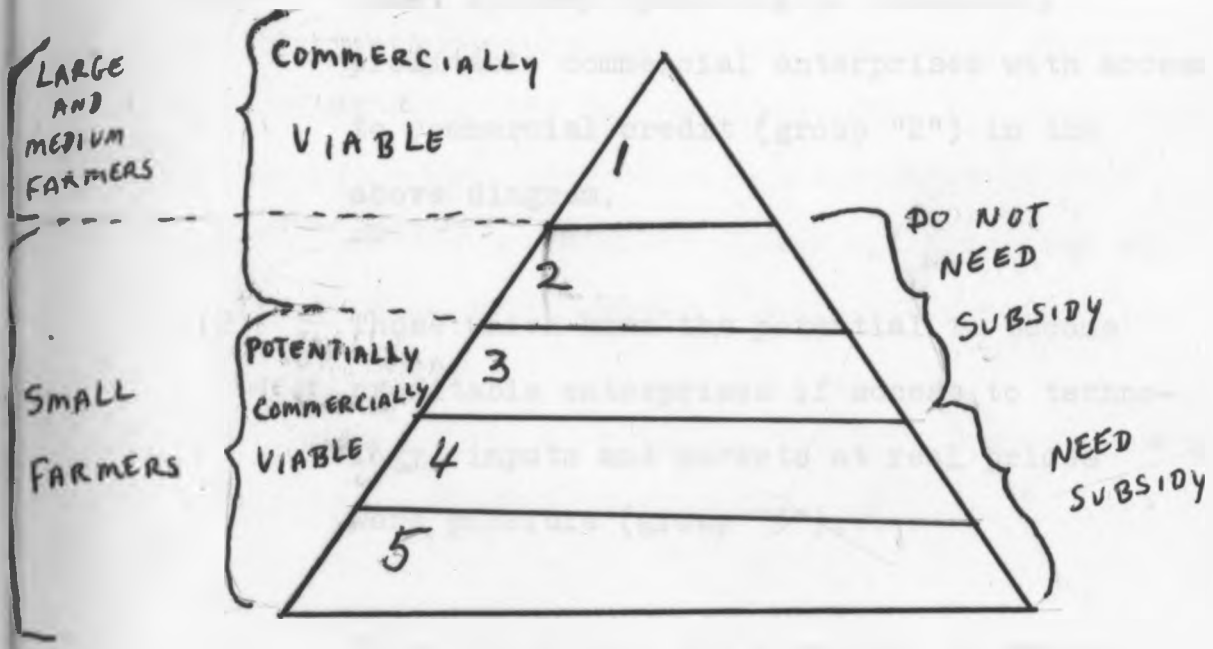
efficiently. And this, we need to know. (2) The definition ignores a farm's scale of operation and its potentiality. For these reasons we will not adopt the A.F.C.'s definition of small farms.

The 1975 Kenya Statistical Abstract defines small farms as "all other areas of arable farming" - apart from farms in scheduled areas. This definition is again confusing because in terms of acreage owned, arable farms outside the former scheduled areas (European Farms) could be much larger than some "large farms" which are still in scheduled areas. For this reason, we will not adopt this definition either.

The definition of small farm that we adopt is that which is suggested by Judith Heyer[5] and presented in the AID Spring Review of Small Farmer Credit.[6]

Both Heyer and AID define size of farms not just in terms of acreage and/or gross farm revenue but also in terms of their commercial viabilities and market shares.

On the basis of commercial viability and market shares, the AID Spring Review of Small Farmer Credit used the following diagram to classify farms into large or small categories:



Group 1 represents large farms. Their basic characteristic is that they produce almost exclusively for the market. They will almost always be large, even in terms of their acreage sizes. They are for all practical purposes, purely commercial enterprises.

Group 2 through 5 represent small farms in varying degrees of their commercial viabilities and their market share sizes. Their basic characteristic is that they produce partly for the market and partly for home consumption.

Thus, there are four basic types of small farms:

(1) Those already operating as reasonably profitable commercial enterprises with access to commercial credit (group "2") in the above diagram.

(2) Those which have the potential to become profitable enterprises if access to technology, inputs and markets at real prices were possible (group "3").

(3) Those which have the potential to become profitable enterprises but will need special incentives - subsidized prices - during an unspecified period of time (group "4").

(4) Those with such poor resources that improved access or even new technology would not provide a viable farm enterprise capable of supporting the farming unit (group "5") - this includes the landless farm labourers, garden plot farmers in "scheduled areas" crowded farms in settlement schemes, small-scale farms in dry areas etc.

Although the above definitions of small farms are good enough as an initial classification we need to develop some measures and indicators of small farm commercial potentials to make the definitions more satisfactory. The cash crops grown by the small farm, the farm's suitability for production of market crops, the volume and frequency of farm produce in the local market places will be taken as indicators of small farms' commercial potentiality.

In Kenya, we have all the four types of small farms identified above:

Group Two small farms are found in high potential areas at high altitude. The farm products produced for the market include tea, coffee, pyrethrum, wheat and milk.

Group Three and Four small farms are mainly found at high potential areas at medium altitudes or at the Coast and in medium or low potential areas where only a limited number of cash crops can be grown.

Group Five is mainly found in arid range areas of Kenya where expensive livestock production is the only feasible type of land use. The landless category

is found in over-populated high potential areas.

The farmers that provided data for this study are a mixture of groups three and four and they all came from a low potential area in Kenya.

CHAPTER FOUR

SMALL FARM FINANCE
ITS THEORY AND PRACTICE

1. THE MEANING OF FINANCE

The word finance means different things to different people and sometimes to the same person. It is a word with a malleable meaning.

To some, finance is money - money in its restricted meaning of a medium of exchange. To others it is the management of money. That is, the handling and recording of commodity money as it is received and/or disposed of. It also includes the accounting systems and procedures that ensure its proper utilization.

And yet to others, finance merely means the provision or acquisition of money. The Penguin Dictionary of Economics also ascribes to this view of finance. It defines finance as "the provision of money when and where required". "Finance", the dictionary continues, "may be short-term (usually one year) medium term (usually one year and up to five to seven years) or long term".[7] The last part of this definition clearly equates finance to credit and

adds another dimension to the meaning of finance.

The objection to the above definitions of finance and others of this nature is that they are only part(s) of what finance really is. In this paper, we take finance to comprise three elements: (1) Funds that a firm or farm acquires from outside; (2) Funds that a farm or firm generates within itself by operating its resources; (3) the management of these funds to ensure efficiency in their utilization.

J.C. Van Horne agrees with this view of integrated finance when he says:

> "Overall, then, finance has changed from the field that was primarily concerned with the procurement of funds to one that includes the management of assets (including monetary assets) and the allocation of capital and the valuation of the firm or farm as a whole; and from the field that emphasized external analysis of the firm or farm to one that stresses the decision making within the firm or farm (the internal generation of revenue aspect)". (8)

2. THE FUNCTIONS OF FINANCE

The question that we now pose is what is the role of finance in the firm or farm. Again J.C. Van Horne[9] breaks down the functions of finance into three major

decisions that a firm or farm must make:

(1) The investment decisions

(2) The financing decisions

(3) The dividend decisions in the case of a corporate firm, and the decisions to consume net farm revenue in the case of a farm.

Investment decisions involve the allocation of funds to investment proposals whose benefits are to be realised in the future. In these decisions, the "fund management element of finance ensures that the available funds will not deliberately be committed to unprofitable projects."

The financing decisions involve optimal combination of external and internal funds in an investment expend iture. The rationale behind such a combination is that a firm or farm should not burden itself with debts (since they impose certain costs) or spend its own funds on an investment if these funds can be easily released by debt or credit finance for other purposes.

The dividend decisions involve the distribution of profits by the management of the firm to the shareholders. That is the running down of its internal funds (retained earnings) to reward those who own the firm's capital.

Similar to the dividend decisions are the consumption decisions of net farm revenue by the farmer. Just as in the case of the firm,* the small farmer runs down his internal funds (farm revenue surplus) but for a different reason: to maintain himself, his family and for other consumption purposes.

3. FINANCE AND THE OBJECTIVES OF THE FIRM OR FARM

An objective is a target. It is a guide as to what the firm or farm should be doing. Targets are always set within the confines of the availability of resources that are necessary for their attainment. The basic resources or factors of production that a farm or firm uses to achieve various objectives are:

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* The unincorporated firms, run down their internal funds for reasons similar to those of a farmer.

(1) Land and all other natural resources

(2) Capital (physical and financial)

3. Labour (managerial, skilled and unskilled)

The primary task of any farm or firm therefore, is to state its objective(s) so that it can know which of these resources or what combinations of them will be deployed to accomplish its objectives. The objective of the firm, for example, has been stated by J.C. Van Horne[10] as that of maximising the shareholders' wealth or equity. Thus in the case of a firm, the financial functions of investment, financing and dividend decisions are geared towards the maximization of the shareholders' equity.

Something akin to this may be said about a small agricultural farm which is the subject matter of this paper. We consider the objectives of a small farm to be the following: (1) to provide a stable production of food year after year to ensure a minimum subsistence level of the farmer and his household; (2) to provide a steady and rising farm income that enables the farmer to make purchases of farm equipment and inputs and be left with a surplus income to meet transacting and precautionary demands for money.

Finance as part of capital is one of the inputs of the farm in its production process. It may also be a limiting or a constraining factor in the accomplishment of its objectives. Where investment plans are not implemented because a farm cannot raise required funds internally or externally, or a combination of its external and internal funds (including ability to manage funds) is inadequate to undertake the investments at hand, finance is identified as a constraint on a stable growth in farm output and incomes. What this means is that if farm credit is expanded by some amount, ceteris paribus, farm output will rise. The same will happen if, say, due to a commodity price rise the internal funds of a farm increase. Improvement in the quality of fund management on the farm will also bring about the same effect.

It is instructive to note that if there are no investment plans standing by for lack of funds, the above plans will, if anything, cause only a negligible increase in farm output.

In this paper, we make a basic assumption that there are many viable investments on small farms in Kenya but they are not taken because of financial constraints.

4. AN OVERVIEW OF FINANCE IN SMALL FARMS IN KENYA

Finance in Kenya's small-scale farms has a remarkable resemblance to that of corporate finance of the 19th century Western economies. Just as corporation finance in those economies was initially seen in terms of external finance with little or no reference to the generation and management of funds within the company,[11] the small farm finance in Kenya is seen largely in terms of external farm credit. Kenya's 1974-1978 Development Plan lends support to this view. The financing of farm development expenditures is estimated purely in terms of external credit that will be availed to these farms by the lending agencies.[12] The internal revenues of these farms are ignored or are assumed to be zero.

Following are estimates of expenditures on small farm credit by the Agricultural Finance Corporation of Kenya over the plan period. (see next page).

Table 4.1:

Years	1972/73 Estimates	1973/74	1974/75	1975/76	1976/77	1977/78	Plan Total
Development Loans: Amounts	99	764	650	780	1,150	1,800	5,144
Total AFC Spending	937	2,921	2,550	3,480	4,950	5,362	19,265
As a Percent of total loans by AFC to Large and Small Scale Farmers	10.6	25.2	25.5	23	23	35	
Percentage going to large farms and range areas	89.4	74.8	74.5	77	77	65	

Source: Government Printer: Kenya Development Plan 1974-1978, pp. 202-213 Tables 10.2 and 10.7

In addition to about £5 million that will be loaned to smallholders, by the AFC over the plan period, a further £3 million will be loaned under the Cooperative Credit Scheme and another £1 million under the Settlement Credit Scheme.[13]

* The above table shows that credit to small farmers over the plan period averages about one-third of credit to large scale farmers.

The share of credit that goes to small farmers rises rather sharply at the end of the current plan period and will continue to do so in accordance with Kenya's basic agricultural development strategy. The strategy involves an "increase in the rate of public expenditure programmes aimed at helping large number of farmers to intensify production....This implies giving highest priority to programmes aimed at developing the smallholder farming areas....The rationale behind this strategy is that "the evidence available suggests that most farm products can be produced very successfully on small-scale farms. In the long run therefore, considerable amount of large scale farms will be subdivided".[14]

One of the public expenditure programmes mentioned in this strategy is the Farm Credit Programme - a major aspect of farm finance.

Since smallholdings are playing (and will continue to play) a crucial role in Kenya's agriculture, and given a popular belief (conventional widsom), that smallholders financial capital is limited, it seems worthwhile to study the effects of various aspects of farm finance on smallholdings' output and incomes.

5. PREVIOUS STUDIES ON SMALLHOLDER FINANCE IN KENYA

A number of studies have been carried out in Kenya with a view to defining a proper role of farm finance in Kenya's agricultural development. But many of these studies have been rather biased in their investigations. They seem to place undue emphasis on the role of small farm credit in farm development to the neglect of the role played by internal revenues of these farms and the farmers' skills in managing the funds they receive.

The most comprehensive of these studies is the "Small Farm Credit in Kenya"[15] by the AID Small Farm Credit Spring Review. This survey shows that

the total amount of credit available to smallholders is very small.

> "Of 1.2 million smallholders, it seems that fewer than 250,000 have access to formal credit. These 12-15 per cent of small farmers are probably in the upper quantile of smallholders in terms of farm size and gross income."(16)

The AID Survey also reveals that most smallholders' external funds come from the Cooperative Societies.

> "Of the institutions serving only smallholders, the major source in terms of volume of credit and number of borrowers is the cooperative movement". (17)

In the rural areas, this credit is provided largely in kind and for seasonal inputs. Thus the volume of small farm external funds is not only small, but its institutional sources are also limited.

According to the AID Survey, institutional sources of farm credit for smallholders in Kenya include the following:[18]

1. Commercial banks
2. Kenya Farmers Association (KFA)
3. Agricultural Finance Corporation (AFC)
4. The Kenya Tea Development Authority (KTDA)

5. Pyrethrum Board
6. National Irrigation Board
7. Cotton Lint and Seed Marketing Board
8. Horticultural Crop Development Authority
9. Chemalil Sugar Outgrowers Scheme
10. Cooperative Societies
11. FAO Input Supply Program
12. British Land Transfer Program

Credit to large-scale farmers is also administered by some of the above institutions.

Non-institutional credit sources for smallholders include:[19]

1. Loans from family members
2. Remittances of family members working in towns
3. Loans from village headmen and merchants.

The Kenya Farm Credit Survey views smallholder credit, not as a constraint on small farm development but as a catalyst[20] for promoting that development.

Despite its comprehensiveness, the "Survey of Farm Credit in Kenya", misses or neglects two points about the nature of small farm finance.

(1) Consideration of internal revenues of small farms in terms of their relative sizes to farm credit and their importance in farm investments.

(2) The management of small farm funds.

A study by Joseph Vasthoff on Small Farm Credit in Kenya noted that lack of credit is in fact a constraint on small farm development. According to the results of his field work, credit extension had a positive impact on small farms incomes.

> "The results obtained in the survey of 108 sample farms show that the extension of credit to small holders can improve farm income substantially... the increment to net income as a result of credit provided was calculated to be Shs. 206 per annum....and the average annual net return on average invested capital was 26%". (21)

According to Vasthoff's findings, the external funds component of small farm finance seems to be the limiting factor on growth in smallholder incomes.

Vasthoff recommends that :

> "loan applications from farmers who are in a position to develop their farms with their own funds should be rejected without exception". (22)

The rationale behind Vasthoff's agrument seems to be that the development of farms with substantial internal funds is not constrained by lack of credit. This however is not the case. Whether or not credit is a constraint on farm development depends not on the availability of small farmers' internal funds, but on profitable investment opportunities that are open to the farmer. If a farmer has three viable farm investments to undertake, and his internal funds are enough only for two, his potential farm income will be smaller than it would otherwise have been, if he is deprived credit to undertake the third investment.

Thus the criterion for granting development loans to small farmers should not rest on the levels of their internal funds as Vasthoff suggests, but on the size of farm investment demand that cannot be met by his internal funds - i.e. the unsatisfied demand for farm investments. The larger the unsatisfied demand, the more eligible he becomes for credit finance irrespective of whether the levels of his internal finance are high.

This point will be better understood if we think of farm finance not in terms of farm credit or internal farm revenue, but in terms of a component of those two funds along with the human skills that exist to use them efficiently.

Contrary to conclusions reached by Dr. Vasthoff about credit being a constraint on small farm development, a study by Heyer during 1962/63 showed that this was not the case.[23]

The findings of this study showed very clearly that capital (financial capital) was not a binding constraint on small farm development in Masii (Low land Machakos), the area in which she set up her experiment.

Her original hypothesis was that credit was a major limiting factor on peasant agriculture. This hypothesis however was discarded in the very early stages of the study when it became apparent that credit was available but returns in farming were risky and low.

> "Credit was going into alternative uses, themselves not very profitable either. There appears to be no acute shortage of capital in Masii either among farmers or traders and evidence suggests rather a shortage of profitable outlets for available funds". (24)

Further evidence from this study suggests that small farmers may not have difficulty in obtaining funds because they have assets that they can easily liquidate. Their problem is to find profitable investment outlets for the funds.

> ".....Many farmers have realisable capital in form of cattle and sometimes other savings as well....The funds that are available on the farms do not go into agriculture but into cattle". (25)

Unfortunately, this statement is capable of being misunderstood. The fact that farmers prefer to invest available funds into cattle rather than in agriculture is not enough evidence that finance is not a long term operating constraint on small farm output in terms of more cash or food crops. In some areas, provision of credit for cattle husbandry could be a prerequisite to small farm development. This is because cattle investments (although risky) could generate funds to alleviate non-financial constraints on small farms.

In a more recent paper, Heyer[26] stresses the importance of financial management ability in the success of a smallholder credit scheme.

> "Smallholders in turn are in-experienced in the use of credit.....there is certainly a problem of education in relation to credit for smallholders. This credit is often given to people with very little experience in financial dealings. There is little attempt to explain the procedures, the terms and the obligations involved....."

The point being made here is that providing funds to the small farmers, even under conditions of profitable investment opportunities, may not necessarily lead to expected results. If a farmer does not possess financial management skills he will achieve less than optimal results in his use of funds made available to him. Thus in any credit package, there should be a financial management component if it is to achieve the desired results.

This argument is analogous, to that given by Wyeth, et.al., in their evaluation of the Kenya's SRDP Vihiga/Hamisi Credit Schemes[27] with respect to the technical farm extension component in a credit programme. They point out that:

> "crop production will not be enhanced if farmers are not taught how to use the inputs which are provided through credit and will not increase their incomes sufficiently to repay the loans without undue hardship". (28)

The essence of farm extension is to ensure, among other things, that credit inputs, or those which are credit-purchased, are used as specified, thereby achieving technical efficiency in their application. The essence of "financial extension" is to ensure economic efficiency in the use of credit. This is done by guarding against use of more costly credit-purchased inputs or equipment to achieve results that could easily be attained through purchases of cheaper factors of production.

Both Heyer and Wyeth, et.al. recognise in their respective papers that cooperative structure, despite its management ills, may be the most appropriate way of channelling credit to small farmers in Kenya. Heyer favours consideration of a cooperative society as a vehicle for delivering credit to small farmers:

> "The advantages of using the locally based institutions like traders and cooperative societies are that they have easy access to views on the integrity of the applicants, and the potential of the investments, which should help them to make efficient selections. They have good informal supervision possibilities....". (29)

Wyeth, Mbugua and Schonherr favour distribution of credit through cooperative societies mainly because they help reduce costs of collecting loan repayments from small farmers substantially.

> "Smallholder credit is still an attractive alternative for crops that are marketed through one organisation, such as a cooperative .....which can collect repayments automatically from farmers' sales".

In this study, cooperative structure is recognised as the most suitable facility for distributing credit to small farmers for both of those reasons.

Studies by J.D. Von Pischke[30] about credit in Kenya agriculture have shown that the "need creed" for credit in smallholdings is false. Substantial savings are generated among smallholders; and potential for additional savings exists in these holdings.

We conclude the credit debate in Kenya agriculture with the following table (pages 54 and 55).

From this table we see that the proportion of small farmer credit to total credit issued in 1971 was approximately 25 per cent (items "DD" and "DE").

Given that small farmers form the bulk of Kenya's farming population, this indicated a highly inequitable distribution of credit facilities in Kenya agriculture in 1971. Unfortunately, this inequality still persists. Nothing has been done since 1971 to change the relative credit distribution between small and large farmers in Kenya as is portrayed by Von Pischke in the table below. The Agricultural Finance Corporation (AFC) - the main farm credit agency for the Kenya government, has not changed its lending policies to small farmers. It still insists on land title deeds as a security for its loans which most small farmers in Kenya do not have. Thus the AFC credit policy is unfair to small farmers.

Table 4.2: Comparison of Credit Statistics with Selected Flows in Kenya's Agricultural Sector

	Item	Amount (K.£. Million)
AA:	Contribution of the agricultural sector to GDP (at factor cost in 1971)	
AB:	Outside the monetary economy	95
AC:	Within the monetary economy	
AD:	Enterprises and non-profit institutions	74
AE:	General Government	7
AF:	Total	176
BA:	Gross marketed agricultural production in 1971	
BB:	Small Farms	45
BC:	Large farms	42
BD:	Total	87
CA:	Gross capital formation by agricultural sector in 1971	
CB:	Outside the monetary economy	n.a.
CC:	Within the monetary economy	
CD:	Enterprises and non-profit institutions	12
CE:	General government	2
CF:	Total	14
DA:	New (presumably gross) agricultural credit issued by parastatal corporations in 1971/72	
DB:	Small scale farmers - Short term	179,000
DC:	- Medium term	728,000
DD:	Total	907,000
DE:	Total issued: all types of farmers:	
	- Short term	1,429,000
	- Medium term	764,000
	- Long term	1,761,000
	Total	3,954,000

	Item	Amount (K.£. Million
EA:	Commercial bank credit outstanding to private agricultural sector at December 31, 1971:	13
FA:	Percentage comparisons Short term credit issued by parastatal corporations (item DE DO plus bank credit outstanding to agriculture EA) as a percentage of:	
FC:	Private sector monetary agricultural GDP AD)	19%
FD:	Gross marketed marketed agricultural production (BD)	16%
FE:	Short-term parastatal credit to small farmers (DB) plus short-term bank credit outstanding to agriculture (EA) as a percentage of small farm gross marketed production (BD)	3%
FF:	Medium term bank credit outstanding to private agriculture (EA) plus parastatal total medium term credit as a percentage of gross monetary capital formation by the private agricultural sector (CD)	37%

Source: A Critical Survey of Approaches to the Role of Credit in Smallholder Development by J.D. Van Pischke (in "Financing Rural Development") edited by Frank A. Wilson and Victor F. Amann, pp. 2-3.

Yet small farmers contribute more to Kenya's gross marketed agricultural production than large farmers (see items "BB" and "BC" in the above table and the 1974-1978 Kenya's Development Plan, pp. 197-9).

The above table also shows that the contribution of small farm credit to Kenya's gross marketed agricultural production is small relative to that of credit to large farms (items "FE" and "FF" above).

Thus the present position of small farm credit in Kenya is that its institutional base is limited and its contribution to the marketed agricultural production is small.

5. Credit Studies Elsewhere

The debate on the role of agricultural credit in the economies of Less Developed Countries has been, and still continues to be loud and unabating. In particular, its popular role in smallholder agriculture is far from being understood both by policy-makers and economists alike.

In Uganda, a study by Diana Hunt,[31] noted that:

> "throughout Uganda the greater part of agricultural development had taken place without the use of institutional credit". (31)

Furthermore, just as in Kenya, the sources of institutional credit were found to be limited. Cooperative societies were the main source of institutional credit to small farmers. Profitable opportunities for using that credit were however found wanting.

> ".....until alternative uses of short term credit other than the present use, value of providing short term credit through cooperatives is highly questionable".

The problem of limited institutional credit and limited investment opportunities where funds are available, was identified in Ethiopia, Malawi and Zambia[32] and it extends to other less developed countries as well.

It was perhaps in recognition of the global nature of small farm finance that motivated the United States Agency for International Development (USAID) to conduct a massive survey of farm credit programmes in June, 1973, in less developed countries.

It includes studies from more than 30 countries and also contains a number of country and analytical papers about small farm credit.

The findings of this survey are summarised by F.B. Rice in his "Summary of Spring Review of Small Farmer Credit":[33]

> "With respect to the role of credit, the conclusions are that credit is necessary in the long term process of capital formation on small farms, but that an infusion of new public credit is not always needed and the conditions under which these funds can successfully affect small farmer productivity are more restrictive than commonly supposed. If technologies and markets are not set to reward small farm adopters for taking risks and investing borrowed funds, credit from whatever source will be wasted.....Small farmers are seen to respond to suitable incentives, and to invest in new technologies. Here the source of funds is not only institutional programmes, but also on-farm savings and informal money lenders.....In fact these other sources are often adequate to finance the initial period of technological change. If small farmers are not adopting an allegedly improved technology for basic food crops, the explanation usually does not involve the lack of credit". (34)

Thus the AID Spring Review of Small Farmer Credit cast doubt on the necessity for credit.

CHAPTER FIVE

RESULTS OF THE FIELD WORK

Basic Data Collected

In this chapter, we present data that review the extent of farm development in Nkondi. On the basis of this information, we hope to be able to assess the scope for further development on the sample farms and to suggest possible improvement on what is already happening on these farms.

The format of our data presentation is as outlined below:

(A) Characteristics of Sample Farms

(B) Farm Investments (a selected inventory)

(C) Household Assets

(D) Farm Projects intended for the Next Season

(E) Non-Credit Funds

(F) Credit Funds

(G) Use of In-kind Credit on Sample Farms

(H) Other Data Related to Cooperative Credit

(I) Obstacles to Development of Farms Studied

A. SOME CHARACTERISTICS OF SAMPLE FARMS

Table 5.2: Years for Which Sample Farms Have Been Under Cultivation

(1) Number of Years Farm has been Under Cultivation	(2) Number of Farmers	(3) Percentage of the Total
1 - 4	8	15
5 - 7	18	36
8 - 10	16	32
11 - 14	10	20
Total	52	100

The above table tells that over 50% of the farms have been under cultivation for eight years or more. Only 16% of the sample farms have been cultivated for four or fewer years.

It further reveals that settlement in Nkondi scheme was not spontaneous. When the scheme started in 1962/63, only a small number of farmers (about 20% of the present farmer population in Nkondi) moved in. The majority of farmers moved to the settlement scheme between 1966 and 1970.

Table 5.2.1: Sample Farmers' School Education

(1) Standard or Form	(2) Number of Farmers	(3) Percentage of Sample Size
None	16	31
Std. I - IV	24	46
Std. V - VII	10	20
Form I - IV	2	4
Above Form IV	-	-
Total	52	100

Post-School Training Institutions Attended by Sample Farmers

(1) Name of Training School or Institution	(2) Number of Farmers	(3) Percentage of Sample
None	20	40
Rural Training Centre (RTC)	25	49
Teacher Training College (TTC)	1	2
Bible School, RTC	4	8
Market Place (tailoring school)	1	2
Kenya Institute of Administration (KIA)	1	2
Total	52	100

The first table above shows that the illiteracy level among the sample farmers is high. About 31% of

sample cannot read or write. The majority of farmers who have been to school, have had only four years or less of schooling. Given that the first two years (and often times three) in rural schools are spent learning how to write and read, it is obvious that the "educated" sample farmers left school with very little useful knowledge.

The second table above shows that only a very slow progress has been made in giving farmers some kind of after school education. Only about 50% of the sample farmers have attended the predominantly government sponsored rural training centres. 40% of the sample farmers have never had any post school education and most likely the majority of them have never had any formal education at all.

Table 5.3: Size of Sample Farms

(1) Size of Farm Owned	(2) Farmers	(3) As a Percent of Sample Size	(4) Total Acreage of All Sample Farms	(5) Total Cultivated Acreage of Sample Farms	(6) Cultivated Acreage as a Percentage of Total Acreage
1 - 10	6	11			
11 - 15	5	9			
16 - 20	35	70			
21 - 40	4	7			
Over 40	2	4			
Total	52	100	1022	417	41%

Mean acreage for sample farms 19

From the above tabulation, about 80% of Nkondi farmers own more than 10 acres. We further notice that the variation in farm sizes is not great.

Under the Agricultural Finance Corporation (AFC) definition of small farms, most of these farms would qualify as large farms. But as argued earlier, other factors, mainly the scale of operation and the proportion of marketed surplus of farms should be taken into account in deciding the "size" of the farm.

The most important thing to notice about these farms is that only about 40% of the total acreage that is available for cultivation is actually being utilized for that purpose.

Table 5.4: Acreage Under Cultivation in Sample Farms

(1) Cultivated Acreage	(2) Number of Farmers	(3) As a Percent of Sample
1 - 5	11	21
6 - 10	26	50
11 - 15	10	20
16 - 20	4	7
Over 20	1	2
Total	52	100

Average Acreage under Cultivation 8

Most sample farmers have opened only upto six to ten acres of their land. With a mean holding size of 19 acres for the sample farms, and the mean cultivated portion of 8 acres, this leaves each sample farmer with approximately 60% of land that he either uses as pastureland or leaves it completely idle.

Table 5.5: Portions of Arable Land Reserved for Livestock Pasture in Sample Farms

(1) Pasture Acreage	(2) Number of Farmers	(3) As Percent of Sample Size
None	35	69
1 - 10	13	25
11 - 20	3	6
Over 20	1	2
Total	52	100
	Total Pastureland Acreage	155
	Mean Pasturage in Acres	3

The small number of sample farmers who have pastureland in their holdings suggests that either most farmers in Nkondi do not own livestock or they own livestock but it is kept or grazed in other farms. This will be clear in the table that follows.

What the pastureland table reveals is that most uncultivated land in Nkondi is lying idle.

Table 5.6: Livestock Capital in Sample Farms

(1) Number of Local Cattle or Goats and Sheep	(2) No. of Farmers		(3) Sample per Capita Livestock	
	Local Cattle	Goats and Sheep	Local Cattle	Goats & Sheep
None	10	11		
1 - 5	12	10		
6 - 10	10	13		
11 - 20	18	10		
21 - 30	1	3		
Over 30	1	5		
	52	52	9	10
Total Number of Cattle			453	
Total Number of Goats & Sheep			514	

The above table is limited by the fact that most farmers could not remember and/or did not know the actual sizes of their sheep and goat flocks. The goat and sheep figures are therefore only crude estimates of the actual goats and sheep owned by the sample farmer. The cattle figures are fairly accurate. Most farmers knew the size of their cattle herds well and they were not, contrary to the author's expectations before field work, afraid to disclose them.

The first thing about the table is that most farmers in Nkondi own livestock. The second thing about it is that most of this livestock does not

graze permanently (or graze at all) in Nkondi farms. This must be so, since from the pastureland and livestock table, about 80% of the farmers own livestock but only about 30% of these have pastureland for livestock in their Nkondi farms. The explanation for this is that most farmers in Nkondi keep and graze their livestock in the unsurveyed Eastern and Southern dry areas of Nkondi and in other unsurveyed areas of Tharaka where pasture is available. It seems that keeping livestock at Nkondi adds to the management problems on sample farms and farmers seem to avoid it by keeping livestock on separate pieces of land. Keeping livestock in Nkondi would force farmers to practice some kind of destocking because pasturage in Nkondi is scarce relative to the numbers of livestock owned by the sample farmers.

Destocking however may be a hard thing for the Nkondi farmers because livestock to them is a form of capital. Thus separation of livestock and crop activities on different pieces of land is the feasible and the preferred alternative to destocking as far as the sample farmers are concerned.

Table 5.7: Cash Crops Grown on Sample Farms

(1) Cash Crop	(2) Acreage	(3) Percentage of Sample Farmers Growing the Crop(s)	(4) Percentage of Land Under Cash Crop to Total Cultivated Land
Cotton	141	100	33
Sunflower	38	70	9
Totals	179	85*	42

* Percentage of total farmers who grow both Cotton and Sunflower

This table is self-explanatory. It says that Cotton and Sunflower take about 2/5 of the total land under cultivation in Nkondi and about 85% of the farmers in this area grow both Cotton and Sunflower as cash crops.

Table 5.8: Food Crops Grown on Sample Farms

(1) Food Crop	(2) Acreage	(3) Percentage of Sample Farmers Growing Each Crop	(4) Percentage of Land Under Food Crop to Total Land Under Cultivation
Maize	106	100	21
Green Grams	41	56	9
Cowpeas/ P.Peas	14	26	3
Millet/ Sorghum	99	90	21
Beans	32	61	7
Totals*	471	60	61

* Figures in columns (2) and (4) are a bit inflated due to double-counting of interplanted acreages. The error is however small.

Although most farmers planted the above food crops in single stands, a few of them interplanted some of these crops - especially beans with maize or with peas.

The table points out that about 3/5 of the cultivated land is under food crops and that 60% of the farmers grow one of the above food crops while the rest grow only one or some of these crops.

Table 5.9: Crops Grown Last Season for the First Time

I.	(1) New Crops	(2) Number of Farmers	(3) As a Percent of Sample Size
	None	13	25
	Cotton	5	10
	Sunflower	29	55
	Beans	4	8
	Maize	1	2
	Total	52	100

II.	Source of Information for How to Grow these Crops	Number of Farmers	As a Percentage of Total Farmers who Grew New Crops
	Agriculture Staff (Ministry of)	17	44
	Neighbours	15	40
	Mass Media	1	3
	Other	6	15
	Total	39	100

The data assembled in this table indicate that the adoption of new crops in Nkondi is skewed towards high value crops, particularly the cash crops. It also shows that agricultural extension and demonstration effects of neighbour farmers are the critical factors in the adoption process of new crops in Nkondi.

This seems to support Wyeth's[35] hypothesis that good extension is the key to an increasing rural output and rising rural incomes.

B. A SELECTED INVENTORY OF INVESTMENTS IN SAMPLE FARMS

Introductory Remarks

By investment it is meant the production or acquisition of real capital assets e.g. the machinery, new materials, finished and unfinished goods, etc. for use in a production process. More broadly, investment also refers to the purchase of any asset or an undertaking of any commitment, which involves an initial sacrifice followed by subsequent benefits. But in any case, investment involves the practice of capital budgeting i.e. the selection of viable projects and their timing, "the determination of the amount to be invested within any given time period, and the

arrangement of financial means necessary for the completion of projects".[36]

Investment in the context of small farms is taken to mean both the production or acquisition of capital assets and the commitments of funds for which benefits are realised in the future. Small farm investments include expenditures on: farm fences, farm equipment, livestock sheds, land purchases and improvements, major farm equipment repairs, etc. We now look at some of these investments from the study area.

Table 5.10: Sisal Fences

(1) Year Farm Fenced	(2) Acreages Fenced	(3) Cost K. shs.
1962-1965	80	60.00
1966-1969	100	300.00
1970-1973	144	1,195.00
1974-1976	678	1,568.00
Total	1002	3,123.00

The table shows that there has been an upward trend in both the acreages of farm fenced and the amount spent on fencing since 1962 - the year

when Nkondi Settlement Scheme was started.

Table 5.11: Livestock Sheds

(1) Year Built	(2) Cost K.Shs.	(3) Number of Farmers
1960-1964	n.a.*	1
1965-1969	200.00	4
1970-1974	1,555.00	18
1975-1976	120.00	6
Total	1,875.00	28**

* Farmer built the shed himself

** This is merely a cumulative frequency figure. It does not necessarily represent different individuals.

The trend in cattle sheds investment is not clear from the above table mainly because of a small livestock sheds expenditure during 1975/76 period. A closer examination of the table suggests the following about the investment in livestock constructions in Nkondi. The investment in cattle sheds per farmer were rising steadily between 1969 and 1974 but during the 1975/1976 season, a decline in these investments began to set in.

Table 5.12: Farm Equipment Expenditure

(1) Year Bought	(2) Total Expenditure for the Period K.Shs.	(3) Average Annual Expenditure	(4) Annual Percentage Rise
n.a.*	1,271.00	-	-
1966-1970	1,286.00	322.00	-
1971-1973	4,135.00	1,345.00	340
1974-1976	19,427.00	6,476.00	390
Total	26,119.00	2,714.00**	

* Investments for all those years not recalled by sample farmers

** Average annual expenditure for the ten year period

The above table shows a spectacular rate of increase in farm equipment in sample farms. Between 1966/1970 and 1971/1973, farm equipment expenditure in Nkondi rose by 340% and between the period 1971/1973 and 1974/1976, it rose by 390%.

Table 5.13: Farm Equipment Sets Owned by Farmers

(1) Farm Equipment Set	(2) Number of Farmers	(3) As a Percentage of Sample Size
Farm Tools only (forks, hoes, jembes, pangas, etc.)	12	24
Cotton pump, wheel barrow, farm tools	14	27
Cotton pump, ox-cart, cattle pump, farm tools	2	4
Cotton pump, farm tools	16	31
Cotton pump, ox-plough wheel barrow, farm tools	8	15
Total	52	100

All of the sample farmers own some sort of farm equipment. Actually this is not surprising because there is a minimum set of farm tools that must be had before farming can begin. The most popular equipment set is a cotton spray pump and farm tools. The cotton spray pump is owned by 86% of the sample farmers. Again this is not surprising because all the sample farmers are cotton growers. None of the farmers owns a tractor.

Table 5.14: Farm Equipment used to Break New Land Last Year

(1) Type of Equipment Used	(2) Number of Farmers	(3) As a Percentage of Total Number of Farmers who used the Equipment
Tractor	19	66
Hand tools	8	27
Ox-plough	2	7
Total	29	100

From the table we learn that 56% of the sample farmers opened new land in the year previous to the crop season during which this study was carried out.

The most common method of opening new land during that year was tractor ploughing. In fact 66% of the farmers who opened new land used a tractor. This should be surprising at first sight because none of the sample farmers owns a tractor. It is made possible by tractor entrepreneurs who travel as many as forty miles and more from the upper parts of Meru to go and look for clients in Nkondi during the land preparation period.

The trouble with the tractor entrepreneurs is that they are very expensive to hire and their ploughing is very poor. This is evident from the remarks by some of the farmers studied:

> "These tractor owners are purely out for money but not to help farmers. They always arrive in the evening and we pay them before they begin ploughing. They plough at night and leave before we are able to check their work - only to find out the following morning, that they just scratched the soil but did not plough; and we have no alternative but to call them again the next time because we have no tractors."

These tractor contractors do not charge the same price for acre of new land ploughed. Their charges ranged from 120/- to 150/- per acre of new land as of the period when the field work for this study was in progress. The ox-plough contractors charged between 80/- and 100/- for breaking an acre of land.

The reason for low utilization of ox-ploughs is probably that the ox-plough expertise in this area is also low.

C. HOUSEHOLD ASSETS

Table 5.15: Household Items Owned by Sample Farmers

Sets of Items Owned	Number of Farmers	As a Percent of Sample
None	3	6
Chairs, tables, paraffin lamp	13	26
Chairs, tables, mutungis, paraffin lamp, spring bed, mattress, thermos	10	20
Chairs, paraffin lamp, bicycle	5	10
Chairs, table, paraffin lamp, radio, watch, mattress	2	4
Chairs, table, spring bed, mabati roof	6	11
Chairs, table, paraffin lamp, mutungis, mattress, water tank	3	6
Set number 3 (above) plus radio, bicycle, mabati roof	4	8
All items listed above	6	11
Total	52	100

This table shows that the basic set of household items of Nkondi farmers consists of chairs, tables and paraffin lamp. A large number of sample farmers however, (about 26%) have in addition to the basic set, one or more sophisticated household items

such as the radio, spring bed, sponge mattress, bicycle, water tank and "mabati" roofs.

Table 5.16: Value of Household Assets (at Cost) with 1962 as a Base Year

(1) Value of Household Durables Possessed by Sample Farmers (K.Shs.)	(2) Number of Farmers	(3) As a Percent of Sample Farmers
0 - 500	19	37
501 - 1000	11	21
1001 - 2000	9	17
2001 - 4000	10	20
n.a.*	3	6
Total	52	100

* Farmers did not know the value of their household possessions

The importance of this table is that it shows some relative inequality in the wealth of household possessions among the farmers studied. On one hand, 58% of the sample farmers have household assets whose historical value (cost) ranges from shs. 500/- to 1,000/- with a mid-point value of shs. 750/-. On the other, about 37% of the sample farmers have household assets with the historical value of between 1,000/- and 4,000/- and a mid-point of shs. 2,500/-.

Thus the top 37% of the sample farmers have household assets worth more than three times those of the bottom 58% of the sample farmers.

Table 5.17: Main Source of Funds for Purchasing Household Assets

(1) Main Source of Funds	(2) Number of Farmers	(3) As a Percent of the Sample
Cotton and food crop sales	14	27
Food crop sales only	10	20
Salary and food crop sales	6	12
Salary only	5	10
Salary, food crop and cotton sales	5	10
Cotton sales only	3	6
Shop proceeds only	3	6
Salary, cotton and livestock sales	3	6
Other	3	6
Total	52	100

The most popular source of financing household assets is farm income. This suggests that non-farm income (wages, shop proceeds, remittances, etc.) is small relative to income generated by farm activities or that non-farm income is channelled to other uses. In fact, the tables that show the sources of

non-credit finance, (tables 5.19 to 5.25) indicate that non-farm income is actually much smaller relative to farm income.

Thus it seems that the key to achieving minimum inequality in size distribution of household assets in Nkondi is a distribution of farm inputs and extension services that favours the already worse off farmers in this area. Such agricultural inputs as the in-kind credit and such extension services as the farmer education about what cash crops can be grown and where they are obtainable, are crucially linked with the level of farm income and the way these are distributed is bound to affect size distributions of household assets.

D. FARM PROJECTS INTENDED FOR THE NEXT SEASON

Table 5.18: Farm Projects Intended for the Next Season or Few Years

(1) Intended Projects (i.e. farmer intends to:)	(2) Number of Farmers	(3) Percentage of Sample
Open up more land	24	47
Purchase farm equipment (ox-plough)	8	15
Buy grade cattle, plant grass, build cattle sheds	5	10
Keep hybrid poultry	3	6
Build food stores	3	6
Dig water furrow into the farm, purchase fertilizers	2	4
Plant new crops	2	4
No plans	6	11
	52	100

From the table we see that most farmers in the sample, have plans of what developments they want to effect in their farms over the next few years. Whether or not the above projects will be implemented will depend on a number of factors, some of which are: the profitability or rate of return of individual projects, the availability of suitable technology for each project, farmer managerial capabilities, financial resources available, etc.

E. NON-CREDIT FUNDS IN SAMPLE FARMS

The data in the previous two sections, reviewed the characteristics and structure of farm assets in the study farms and also gave an indication of the tempo of farm investments in Nkondi.

We now present data on incomes that the sample farms generate by utilizing the resources that they possess.

Table 5.19: Income from Cotton for a 12-Month Agricultural Year Ended October 1975

(1) Cotton Proceeds (K.Shs.)	(2) Number of Farmers	(3) As a Percent of Sample Size
Under 500	6	12
500 - 1000	14	28
1001 - 3000	22	44
3001 - 9000	7	14
Over 10,000	3	6
Total	52	100
	Total proceeds for the period :	Shs. 96,908.00
	Mean	Shs. 1,864.00

The table shows that Nkondi farmers get a substantial income from cotton, given the low per capita income in the rural areas in Kenya. It also shows that distribution of this income is very inequitable.

Table 5.20: Income from Food Crops for a 6-Month Agricultural Season Ended March 1976

(1) Food Crops Proceeds (K.Shs.)	(2) Number of Farmers	(3) As a Percent of Total Sample Farmers
Under 200	11	21
200 - 400	12	23
401 - 800	14	25
801 - 1000	4	8
1001 - 2000	8	15
Over 2000	3	6
	52	100
	Total food crop income	Shs.32,604.00
	Mean	627.00

Table 5.21: Income from Sunflower for a 6-Month Agricultural Season Ended March 1976

(1) Sunflower Proceeds (K.shs.)	(2) Number of Farmers	(3) As a Percentage of Sample Size
0 - 100	36	70
101 - 200	9	19
201 - 400	4	5
401 - 800	2	4
Over 800	1	2
Total	52	100
Total proceeds K.shs.	5,139.00	
Mean	99.00	

This table does not accurately show the income generating potential of sunflower in Nkondi. The majority of farmers have only a meagre or no income from this cash crop because the crop was introduced only a year ago and its marketing is not yet organised. Farmers sell their crop mainly to one local trader who has been appointed by the Maize and Produce Marketing Board (Meru) to purchase sunflower seeds on its behalf from Nkondi farmers. An organised market for this crop would raise farm incomes substantially in this area.

Table 5.22: Income from Wage Employment

Income per Month (K.shs.)	Number of Farmers
None	41
1 - 199	4
200 - 499	2
500 - 999	4
Over 1,000	1
	52

As expected, the majority of sample farmers do not have a wage income. Wage employment thus contributes very little to total income of farmers in Nkondi.

Table 5.23: Income from Self-Employment

Annual Income	Frequencies by Source of Income			Total No.	% of Sample
	Shop-keeping	Ox-ploughing	Informal trade in Livestock Farm Products		
50 - 100	1	0	2	3	6
101 - 200	1	0	0	1	2
201 - 400	0	1	2	3	6
401 - 1000	1	1	4	6	12
Cumulative Frequency	3	2	8	13	26

The analysis in the above table shows that there are only a few farmers with substantial income - generating self-employment. The category of self-employment that generates the most income to farmers is that which involves informal and unlicenced trade in livestock, farm produce and homecrafts.

Table 5.24: Remittances by Employed Relatives/ Friends

Frequency of Remittances	Frequency of Farmer Recipients
Every month	1
Every three months	1
Two times a year	1
Once a year	3
Subtotal	6
None	46
Total	52

Although the actual amounts of funds remitted are not shown, it is obvious from the above table that the remittances by relatives are infrequent and they accrue to only a limited number of farmers.

Table 5.25: Personal Savings

(1) Institution in which Farmer Saves Money	(2) Number of Farmers	(3) As Percent of Sample Size
None	32	62
Shop	6	11
Cooperative Society	3	6
Commercial Bank	11	21
Total	52	100

About two-fifths of the sample farmers have "savings accounts". According to this table, the most popular saving institutions with the farmers are the Commercial banks followed by the local shops. At least this is some evidence that there exists a demand for saving institutions among the small farmers in Nkondi and their personal savings could increase greatly by providing them with convenient saving institutions.

F. CREDIT FUNDS

> "The demand for funds by businesses (and also by small farms) is a derived demand, just as the demand for labour is a derived demand". (20)

Farms will not demand funds for their own sake. They will demand them because of the worth of the purposes for which they will be spent. If loanable funds are not a free good to the farmers, and the farmers are borrowing them, then it is reasonable to assume that there exists profitable uses for funds among such farmers which cannot be financed by their own funds alone. This assumption being true, the next thing one ought to investigate, is how profitable those uses are in order to see whether they can compete for the available loanable funds with other profitable uses elsewhere.

As the data below show, profitable uses of credit exist in Nkondi. But how profitable these uses are, and their competitive position with others elsewhere in Kenya, we cannot tell. A further analysis is necessary.

Table 5.26: Cash Credit from Any Source

(1) Source of Credit	(2) Number of Farmers	(3) As a % of Sample	(4) Amount Borrowed (K.Shs.)	(5) Purpose for which credit was used
Shop	3	6	1,670.00	Paid farm labour Bought/hired farm equipment
Friend/ Relative	10	20	3,801.00	Paid school fees Bought cattle Paid farm labour Bought beer Paid for transport of farm produce
Other (Trade Board)	1	2	3,000.00	Bought shop stocks
Totals	14	28	8,471.00	

Only one of the sampled Nkondi farmers had access to cash credit from a credit institution during the season that preceded the one which coincided with the field work of this study. Most farmers obtained cash credit from shops and friends and/or relatives.

Table 5.27: Cash Credit Expenditures by Purpose

(1) Purpose	(2) Amount K.Shs.	(3) As a Percentage of Total Credit
Farm expenditure	2,320.00	26
School fees	150.00	2
Livestock & Retail Trade	3,000.00	36
Other	1.00	-
Total	8,471.00	100

From the table one may conclude that most cash credit in Nkondi does not go into farming, but rather it finds its way into livestock and retail trade where returns are probably higher than in agriculture.

Table 5.28: In-Kind Credit from the Cooperative Society

(1) Item Borrowed	(2) Quantity Borrowed	(3) Cost per unit	(4) Value (K.Shs.)
Cotton Insecticides	115 (cartons)	130/-	14,950
Cotton Pumps	3 (pumps)	520/-	1,560
		Total	16,510

G. USE OF IN-KIND CREDIT FROM THE COOPERATIVE SOCIETY

Table 5.29: Use of In-Kind Credit by Purpose

(1) Purpose for which In-kind credit was used	(2) Number of Farmers	(3) As Percentage of Sample
Given free to others	-	-
Sold for cash	-	-
Lent to friends/ Relatives	1	2
All used for spraying cotton or other crops	10	19
Kept for use in the following season	41	79
Total	52	100

Table 5.30: Other Crops Sprayed with Cotton Insecticides loaned by the Cooperative Society

(1) Crop sprayed	(2) Number of Farmers	(3) As a percent of Total Sample Farmers
Pigeon peas alone	1	2
Green grams alone	5	10
Pigeon peas and Green grams	4	8
Total	10	20

The above two tables show that credit is being used largely for the purpose for which it is granted. However, the large percentage of people who keep it for use in the following season suggests that it is not being used in an efficient manner.

H. OTHER DATA RELATED TO COOPERATIVE CREDIT

Table 5.31: Farmer Reaction to Stoppage of Loans by Cooperative Society

(1) Type of Response	(2) Number of Farmers	(3) As a Percent of Sample Size
Would stop growing cotton	14	27
Would grow cotton and also spray it	38	73
Total	52	100

Attitudes of Farmers towards Cooperative Society and its In-kind Credit

To assess what farmers thought about the role of cooperative society in the distribution of in-kind credit and the effects of that credit on their welfare, they were asked to say how cotton (the crop, whose production is credit-supported) had affected their welfare statuses.

Table 5.32: Cotton Production and Perceived Farmer Welfare

(1) State of Farmer Welfare as a Result of Growing Cotton	(2) Number of Farmers	(3) As a Percent of Sample
Better-off	44	85
Worse-off	6	11
Not known	2	4
Total	52	100

Thus the sample farmers think that cotton production is beneficial to them.

Reasons why Farmer Says Cotton Production has Made Him Better Off

Table 5.33:

(1) Reason why Cotton has made Farmer Better off	(2) Number of Farmers	(3) As a Percent of Sample
Has generated for him funds for weeding, cultivating and for general farm development	13	26
Has helped him pay school fees	5	10
Has given him more profits than production of any other crop	18	35
Has enabled him to obtain funds for buying farm equipment	5	10
Has enabled him to start business	3	6
No reason given	8	16
Total	52	100

Thus farmers feel that cotton has made them better off because it gives them a cash income.

Reasons why Farmer Feels Cotton Growing has made him Worse Off

Table 5.34:

(1) Reason why Cotton Growing has made Farmer Worse Off	(2) Number of Farmers	(3) As a Percent of Sample
Sees no difference between him and those who do not grow cotton	3	6
Deductions by Coop. Society for credit repayments do not leave farmer with profit	2	1
Cotton is always destroyed by insects	1	4
Total	6	11

I. OBSTACLES TO FARM DEVELOPMENT IN THE STUDY AREA

In order to assess what obstacles constrained farm development in Nkondi, farmers were asked to mention their three greatest problems in order of their importance. The following results were obtained:

Table 5.35:

(1) Problem Mentioned	(2) Farmer Frequencies by Problem Rankings			(3) Frequency Scores for each problem for all ranks
	Problem No. 1	Problem No. 2	Problem No. 3	
Lack of tractors	19	15	2	36
Lack of water	17	7	4	28
Shortages or delays in farm supplies	6	12	8	26
Lack of money	3	11	7	21
Lack of transport	5	1	9	15
Lateness in cotton payment	2	3	1	6
Lack of pasture	-	1	-	1
Total	52	50	31	133

Thus the main constraints on farm development in Nkondi may be ranked in order of their importance as: (1) Lack of tractors, (2) Lack of water, (3) Shortages in farm inputs and supplies, and (4) Lack of money (finance).

CHAPTER SIX

MATCHING HYPOTHESES WITH EMPIRICAL EVIDENCE

In this chapter, we present computer solutions for the regression models formulated in chapter two, and use them together with the data presented in chapter five, to test the hypotheses for this study.

1. SOLUTIONS OF THE REGRESSION MODELS

The Farm Investment Function

$FI = K + dC_p i = d_1 Coi + d_2 Foi + Ei$

(see next page for table 6.1-solution for above equation)

The table below shows that the explanatory variables in the farm investment model, account for about 41% of the variations in farm investments of Nkondi sample farms.

Thus a very high proportion of farm investments in Nkondi is not accounted for by this model. This is consistent with a large positive constant. The constant term is about half of the average investment in sample farms and this suggests that there are other important factors that affect farm investments in the

Table 6.1:

(1) Dependent Variable (Regressand)	(2) Independent Variable (Regressor)	(3) Constant Term	(4) Regression Coefficient (β)	(5) Standard Error of Estimate (S.E.)	(6) Computed T Statistic (T.Stat)	(7) Correlation Coefficients of Regressors with the Regressand (r)
Farm Investment (Fi)	Cooperative in-kind credit (Cp)		82.42	33.88	2.43**	0.37
	Other credit (Co)		0.06	0.13	0.44	0.13
	Farmer's own funds (Fo)		0.10	0.08	1.22	0.25
	Constant	+ 264.19		129.88	2.03	
	R^2 = .41 Degrees of Freedom = 48					
	Mean Farm Investment in Sample Farms: K.Shs. 590.00					

** Significant at 95% level of confidence.

study area. But the performance of the explanatory variables of this model in explaining changes in farm investments is not very bad, given that the analysis is cross-sectional. This is because the determinants of farm investments are not uniformly the same in all sample farms.

Among the explanatory variables of the above model, cooperative in kind credit has the greatest influence on Nkondi farm investments. There is no evidence in this model that other credit has a significant influence on the level of farm investment.

The Farm Income Function (1)

$$Fy = A + aCpi + a_1Fli + a_2Fe + Ei$$

(see next page for table 6.2 - solution for above equation).

The independent variables in this model explain about 77% of the variations in farm income in the sample farms.

Except for farmer's education, whose effects on income are insignificant, the other variables, the cooperative in-kind credit and farm investment, are important determinants of incomes in the sample farms. This finding is well supported by the fact

Table 6.2:

(1) Dependent Variable (Regressand)	(2) Independent Variable (Regressor)	(3) Constant Term	(4) Regression Coefficients (β)	(5) Standard Error or Estimate (S.E.E.)	(6) Computed Student's T Statistic (T.Stat.)	(7) Correlation Coefficients of the Regressors with the Regressand (r)
	Cooperative in-kind credit (Cp)		876.92	130.74	6.71*	0.75
	Farm Investment (Fi)		1.07	0.52	2.06**	0.44
	Farmer's school education (Fe)		280.02	348.35	0.80	0.13
	Constant	-625.62		541.09	1.16	
	R^2 = .77 Degrees of Freedom = 48					
	Mean Farm Income in Sample Farms: K.Shs. 2,535.00					

* Significant at 99% level of confidence

** Significant at 95% level of confidence

that when the explanatory variables are zero, the farm incomes are negative. This is evident from the negative constant term in this model.

Farm Income Function (2)

$$Fy = Q + bCi + b_1Zi + b_2Gi + b_3Si + b_4Ai + b_5Mi + Ei$$

(see next page for table 6.3 - solution for above equation).

In the above model, cotton acreage has the greatest leverage and significance on farm income, followed by maize acreage. The rest of crop acreages do not have significant effects on farm income.

The negative regression coefficients of greengrams and sunflower with respect to farm income should be disregarded. Although these coefficients are relatively large, they have no statistical significance. The same thing may be said about the management variable.

Table 6.3:

(1) Dependent Variable (Regressand)	(2) Independent Variable (Regressor)	(3) Constant Term	(4) Regression Coefficients (β)	(5) Standard Error of Estimate (S.E.E.)	(6) Computed T Statistic (T.Stat.)	(7) Correlation Coefficients of Regressors with the Regressand (r)
Farm Income (Fy)	Cotton Acreage (C)		948.23	204.78	4.63*	0.68
	Maize Acreage (Z)		386.83	253.63	1.53***	0.43
	Green Grams Acreage (G)		-216.08	372.17	0.58	0.01
	Sorghum/ Millet Acreage (S)		120.77	211.29	0.57	0.12
	Sunflower Acreage (A)		-612.59	632.83	0.97	0.02
	Farm Management (M)		605.93	288.15	0.77	0.13
	Constant	-1541.07		1614.91	0.95	
	R^2 = .71					
	Degrees of Freedom = 45					

* Significant at 99% level of confidence

*** Significant at 80% level of confidence

Cotton Acreage Function

$$CAi = \alpha + hCpi + h_1 Foi + Ei$$

(see next page for table 6.4 - solution for above equation).

The regression results of the above equation, show that cooperative in kind credit is the major determinant of the sizes of cotton plots in the study area. An interesting thing about the farmer's own funds in this model is that although their leverage effects on cotton production are small, they could nevertheless be significant. This is indicated by a fairly high T statistic of own funds with respect to cotton acreage.

2. THE HYPOTHESES TESTING

We will now use the data assembled in chapter five and the foregoing solutions of the regression equations to test the validity of the hypotheses of this research.

Hypothesis 1:

The bottleneck in small farm development is lack of finance which credit can fulfil.

Table 6.4:

(1) Dependent Variable (Regressand)	(2) Independent Variable (Regressor)	(3) Constant Term	(4) Regression Coefficients (β)	(5) Standard Error of Estimate (S.E.E.)	(6) Computed T Statistic (T.Stat.)	(7) Correlation Coefficients of Regressors with the Regressand (r)
	Cooperative in-kind credit (Cp)		0.62	0.07	9.19*	0.80
	Farmer's own Funds (Fo)		0.0003	0.0001	1.59	0.29
	Constant	+0.85		0.26	3.26*	
	R^2 = .81 Degrees of Freedom = 49					
	Mean Cotton Acreage on Sample Farms: 2.75 acres					

* Significant at 99% level of confidence

To test this hypothesis, we need first to have some indicators of "farm development".

Farm development means more than just a sustained rise in farm output and incomes. It includes in addition, the use of appropriate farm technology, to ensure efficiency in farm resource allocation, diversification of cultivated crops, an improvement in farmer skills and many other factors.

In testing this hypothesis, we take farm incomes and farm investments (proxy for technology) as the major indicators of farm development. The reason for this choice is that both of these factors, more than any other(s), determine a farmer's ability to sustain a rising farm output and also the rate of rise in that output.

We will have two stages in our test procedure. First, we will find out whether lack of finance is a constraint on growth of output (incomes) and investment in Nkondi smallholdings. Second, we will investigate whether credit alleviates that constraint. (If finance is found not to be a constraint in stage

one, stage two will of course not be necessary).

Lack of finance has not been critical to the development of sample farms but it is certainly one of the constraints within which these farms operate. As table 5.35 chapter five shows, lack of money ranks as the fourth greatest problem of the sample farms.

Thus, one would expect upward changes in some of the indicators of farm development in sample smallholdings if more money is injected into them in form of credit.

What is surprising however is that financial constraint in these farms is not alleviated by cash credit. Availability of cash credit to sample farmers will not increase the stock of their farm investment. This is clear from the regression solutions of the Farm Investment Function and the accompanying correlation matrix (Table 6.1).

From those solutions we see that there is no statistically significant effect of additional cash credit on either investment or incomes of the farms studied.

Hypothesis 2:

Farm investments cannot compete with the recurring farm projects for small farmer self-financing

Farm investments are the capital expenditures of the farmer, e.g. expenditures on ploughs and pumps.

Recurring farm projects are farm activities that recur every season or year and for which funds are sometimes needed, e.g. weeding, harvesting, land preparation, etc.

To test the above hypothesis, we need to compare proportionate expenditures of sample farms' own funds on recurrent farm activities and the farm investment projects over some period of time.

Unfortunately, the data we have for these expenditures are not good enough to be used for a rigorous test of this hypothesis.

As a rough approximation, we will take labour costs of sample farms as a proxy for recurrent expenditures (because farm labour is used for a variety

of recurring farm operations) and compare its annual average per sample farmer with the annual investment expenditure (also per sample farmer over the period 1974 to March 1976.

From the investment and labour cost tables in chapter five, we construct the following table:

Period Expenditure made	Average Annual Capital Expenditure (CE) per Farmer*	Average Recurrent Expenditure (RE) per Farmer
1974 to March 1976	Shs. 200.00	Shs. 400.00

From this table we see that in the farms studied, the average capital expenditures during the period 1974 to March 1976, were much less than the average recurrent expenditures over the same period. This observation however does not necessarily lead to the conclusion that small farmers will always

* The component of borrowed funds in these expenditures is about 20% for capital expenditures and 10% for recurring expenditures: chapter five, tables:

spend more of their own funds on recurrent farm activities than on farm development projects. There are at least two reasons why this may not be the case. First, the observation is based on a very short period (about two years) and for this reason it could easily be biased in favour of recurrent expenditures. Second, it is possible that the only reason why the farmers' own funds are important in recurrent expenditures of the sample farms, is that cash credit is not available for these expenditures. If cash credit were available for them, it is possible that farmers would release more of their "own funds" than they are able to release at present for farm development projects. Thus we need more information about cash borrowings by the sample farmers and data on utilization of such funds to be able to test this hypothesis adequately.

Hypothesis 3:

> Transactions demand for cash to hold, is the major constraint limiting the investment of small farmers' funds in farming

This hypothesis is disproved by the Nkondi data. The solution of the Farm Investment Equation

presented in the previous section (Table 6.1), shows very clearly that 'own funds' are not significant to investments in the sample farms. What this means is that an increase in small farmers' own funds will not lead to a significant increase in farm investment and the vice versa.

Thus the fact that small farmers could be holding (hoarding) cash rather than spending it is not crucial to the growth of the investments of the farms studied.

The main reason for this seems to be that a decrease in cash held by sample farmers leads to an increase in expenditures other than those of the farm. This is probably due to the fact that returns to funds spent in farming are lower than those that accrue to funds spent on non-farm activities.

Hypothesis 4:

Cooperative credit in kind encourages misallocation of smallholders' resources because it lowers production costs in favour of some crops and not others

This hypothesis says that credit in kind distorts relative costs of producing crops in a small farm because the production of crop(s) for which credit is given, appears cheap relative to that of the other crops for which credit is not given.

The result of this is that the production of credit supported crop is intensified, with more farm resources being devoted to it, relative to other crops although it may not be the most profitable to produce. In this way, farm resources are said to be misallocated because they are not used where their marginal contribution to the total farm output is the greatest.

The null hypothesis is that credit does not cause a distortion in relative costs of producing farm crops and therefore farm resources are not misallocated. Or that, even if credit in kind distorts relative costs of producing different crops, this does

not lead to resource misallocation on the farm.

The difficulty with this hypothesis is that it requires us to specify an objective function that is common to all the sample farmers so that we may be able to tell whether credit works against, or in favour, of what the farmers want to maximise.

In the discussion that follows, we make an initial assumption (which is relaxed later) that the sample farmers want to maximise their net farm incomes.

The insecticides that are provided on credit to Nkondi farmers to grow cotton, have certainly distorted relative costs of growing crops in Nkondi.

In 1975 when a packet (carton) of insecticides was provided on credit at Shs. 115.00 by the Meru Cotton Society, it cost around Shs. 125.00 in local shops. In March, 1976, when it was provided on credit at Shs. 130.00, it cost around Shs. 147.00 in the local shops.

Thus credit lowers the costs of producing cotton relative to other crops in the sample farms.

As has been shown by the solution of the Cotton Acreage Equation presented in the first section of this chapter, the in-kind credit in Nkondi motivates farmers to open more land to grow cotton. This encourages them to switch some of their scarce resources like weeding time, hired tractor or plough services from the production of other crops to that of cotton.

The issue now is whether, by so doing, they misallocate their farm resources.

The farmers will be misallocating their resources (will not be using them efficiently) if the farm activities from which resources are withdrawn are more profitable than cotton production. A look at marginal contributions of various crop acreages in Nkondi farms to total farm income shows that resources may not be misallocated when they are shifted from the production of food crops to cotton production. This is evident from the regression results of the Farm Income Function presented in

table 6.3 at the beginning of this chapter. From that table we see that an additional acreage of cotton would contribute more to total farm income than additional acreage of any other crop.

Thus to the extent that income maximisation is the objective of the sample farms, we reject hypothesis Four.

If however, we relax the income maximisation assunption of the sample farms, the above finding with respect to hypothesis Four may not hold. This is because producing more cotton for example, relative to other crops, in order to maximise farm income, may conflict with the real objective of the farms, e.g., maintaining a certain level of subsistence farm output.

Hypothesis 5:

> Farmers will respond to shortages and delays in credit inputs by borrowing more of these inputs than they need, whenever they become available.

This hypothesis means that if credit inputs are not supplied to farmers at the right time and in

correct quantities, farmers will tend to borrow more of them than they need in order to cover the risk of not having the inputs at the right time and in quantities they want, during the next season.

What needs to be shown to prove this hypothesis with Nkondi data is that the sample farmers borrowed more cotton insecticides than they needed during the six-month agricultural season ended March 1976 (the season for which credit data were obtained). It should also be shown that there were shortages and delays in credit inputs in Nkondi during the same season or in the previous seasons.

Table 5.29 chapter Five suggests that the sample farmers either had borrowed more insecticides than they needed during the season October 1975/ March 1976, or they had borrowed just the right amount but applied it at less than the recommended rates. This is clear from part of table 5.29 that is reproduced below.

Purpose for which credit was used	Number of Farmers	As a Percent of Sample Size
Kept for use in the following season	41	79
All used during the previous season	10	19
Lent to friends	1	2
Total	52	100

The following table however shows that the sample farmers did not borrow more credit insecticides than they needed. Rather, they applied the insecticides that they were able to borrow at less than the recommended rates and thereby saved some of it for use in the following season.

Source of Additional Insecticides	Number of Farmers	As a Percent of Sample Size
Shops (purchases	15	29
Cooperative Society (loans)	17	33
Total	32	62

The above two tables show respectively that a large number of sample farmers had extra stock of insecticides in their stores during the October 1975/March 1976 season and yet many of them acquired additional insecticides during the same period.

A plausible explanation for this behaviour is that farmers were building up contingency reserves of insecticides in provision for a risk of cotton insecticides not being available in the next season.

The stock of cotton insecticides that is kept by the farmers as a contingency for a risky future can be reduced drastically (or elimitated) by providing the farmers with insecticides in time.

There is thus a strong support for hypothesis Five from Nkondi data. Delays or shortages in the credit financed inputs will not only make farmers want to borrow more credit inputs than they need, but that they will also induce them to apply the borrowed inputs at less than the recommended rates. Such a practice may work against the achievement of the purpose for which credit inputs are given.

Hypothesis 6:

Poorly managed cooperative societies will not fulfil credit needs of small farmers.

We have already shown in tables 6.1 through 6.4 at the beginning of this chapter, that cooperative in-kind credit has positive influences on farm investment and incomes. And thus, it fills the credit needs of small farmers. What now remains to be shown with respect to hypothesis Six is that this success is due to the efficient management of the Meru Cotton Growers Cooperative Society Limited (the Society) - the agency that administers this credit.

Efficiency in management, basically involves organizing, controlling and utilizing available resources in a way that makes it possible to achieve specified objectives.

One aspect of efficient management that was noted about the Society is its highly decentralised organizational structure that goes right down to the cotton growers.

The Society has its headquarters at Gaitu - one of the leading cotton areas in Meru. It also has branches (loan offices) in virtually all cotton growing areas in Meru.

Each loan office is managed by a loan clerk who lends cotton insecticides and pumps to farmers. He lends out credit inputs only to those farmers whose application forms have been reviewed by a Loan Committee. Cotton growers sell their cotton to the Society and in this way, the society ensures that the loanee farmers do not default.

Despite its sound organizational structure, the Society has several weaknesses. First, it does not pay the farmers promptly after they have delivered their cotton crop. Farmers wait two to three months before they are paid and this makes most of them less responsive to the insecticide credit as an incentive to grow cotton. Second, the Society does not have an educational program to instruct farmers on the use of the credit inputs and the benefits to be derived by belonging to the Society or participating in its affairs. Thus virtually all farmers are apathetic about the Society and regard it as a foreign agency.

In general, it seems that a very high standard of management of a cooperative society is not crucial to the effectiveness of its credit to small farms that are at the beginning stages of their development.

In conclusion, it should be noted that the spectacular success of in-kind credit in Nkondi is not due to a high standard of management efficiency in the Cotton Society.

CHAPTER SEVEN

CONCLUSIONS AND IMPLICATIONS

We conclude this study in three sections. In the first section, we review the extent to which the objectives of this study have been achieved. In the second, proposals for accelerating farm development in Nkondi, and Tharaka in general are put forward. And in the third and final section, implications of this study for Kenya Agriculture are examined.

I. EXTENT TO WHICH RESEARCH OBJECTIVES HAVE BEEN ACHIEVED

The objectives of this study have been achieved. The first objective of this enquiry, was to find out whether there exists unsatisfied demand for viable farm investments in Nkondi, Tharaka Division, Eastern Kenya.

The study has in fact shown that there does exist unsatisfied demand for viable farm investments in that area. Virtually all Nkondi sample farmers have concrete farm investment plans for the next season or few years. Quite a number of these intended farm investments require large cash expenditures

relative to the internal funds of Nkondi farmers. This means that the farmers will have to ration their internal funds to investment projects according to their priorities or profitabilities.

The rates of return of the intended farm investments could not be ascertained and further work is needed to determine what these rates are.

The second objective was to identify the non-institutional sources of financing farm expenditures in the study area and the importance of these sources in relation to external finance in farm expenditure.

The non-institutional sources of funds for farm expenditures in Nkondi (in order of their importance) have been found to be the following:

1. Cotton and food crop sales
2. Self-employment in non-farm activities
3. Personal savings
4. Cash credit from friends and relatives
5. Wage employment
6. Credit from shops
7. Cash remittances from relatives

These non-institutional sources of small farmer funds when taken together were found to generate a volume of funds (cash) far greater than that generated by such institutional sources of liquid funds as the banks and Government Credit Agencies. The funds they provided also exceeded the total monetary value of in-kind credit provided by the Cooperative Society. Thus in quantitative terms, funds from the non-institutional sources are at present more important than those from institutional sources.

A major finding, however, with respect to the sources of small farm finance is that institutional in-kind credit has a far greater leverage effects on farm investments and incomes than any other form of small farm finance. According to this finding, in-kind credit should be emphasised as crucial in the financing of small farm development.

The third objective of this research was to consider the main constraints which limit the extent to which small farmer funds can be invested in farming.

These constraints did not come out clearly in this research study. It was expected that farmers would be holding money for such expense items as the school fees, hospital fees and for other household contingencies, and that this would prevent them from investing the money they had in farming.

School fees was found to be a relatively small expense item of the sample farmers and hospital fees almost a negligible expenditure. But there was evidence of a relatively strong demand for money to hold by the farmers studied. About two-fifths of the sample farmers have "savings accounts" with the commercial banks, cooperatives and the local shops. It was not possible to establish the extent to which money is being hoarded in "savings places" in farmers' homes or gardens.

Thus specific hindrances to investment of farmer funds in farming could not be identified. However, some real problems that hinder development of small farms in the study were clearly identified. In order of their importance, the problems that constrain farm development in Nkondi are the following:

1. Lack of farm machinery (mainly tractor)
2. Lack of water
3. Shortages and delays in farm inputs
4. Lack of money
5. Lack of transport
6. Lateness in payments for cotton delivered to the Cooperative Society
7. Lack of pasture

The fourth objective was to examine alternatives to cotton spraying in the use of in-kind credit given by the Cooperative Society.

The finding with respect to this objective is that in its present form, the in-kind credit given to Nkondi farmers can only be used for spraying cotton. This credit consists of two main items: cotton insecticides and cotton pumps. Because cotton + insecticide is meant exclusively and specifically to be used for cotton spraying, it seems that it would not even be desirable, to try it for other alternative uses. It should however be mentioned that cotton pumps are not so specific to cotton spraying as are the cotton insecticides. Farmers use cotton pumps for a variety of purposes in addition to their use in cotton spraying. They are used for spraying

cattle ticks and also as money earning assets: "Money earning" because farmers who have pumps rent them out to those without, at a fee of between one shilling and fifteen shillings per day.

The in-kind credit however could be diversified to include inputs for other crops notably fertilizers and fence wires with cotton still being the security for the credit given.

The fifth objective was to find out whether cooperative credit is being used by the Nkondi farmers exclusively for the purpose for which it is given.

The conclusion of the study with respect to this objective is that the cooperative in-kind credit in Nkondi is being used largely but not exclusively, for the purposes for which it is given.

About 20% of the sample farmers used cotton insecticides to spray pigeon peas and/or green grams during the crop season ended March 1976. About 2% of the sample lent the insecticides to friends or relatives during the same period.

As observed in objective Four above, cotton pumps were also used for other purposes other than cotton spraying. Some 28% of the sample farmers rent out pumps for commercial purposes.

The Sixth obejctive of this research was to ascertain the attitudes of farmers towards cooperative credit in kind in Nkondi and also to establish the basis for such attitudes.

About 85% of the sample farmers think that the cooperative credit they get to grow cotton is beneficial to them. Only 11% of the farmers studied indicated that the in-kind credit to grow cotton is harmful. The other four percent of the farmers could not tell for sure whether the in-kind credit they get is harmful or beneficial.

The common reason given for the in-kind credit being beneficial was that it enables production of cotton which is more profitable relative to other crops and which generate funds for farm development and other uses. For this reason most farmers indicated that credit to grow cotton had made them better off.

The few farmers who indicated that credit to grow cotton had made them worse-off gave as their reasons that after deductions for the payment of in-kind credit a farmer is not left with any profit, that cotton is susceptible to attacks by insects and that growing cotton does not improve ones income.

The majority of sample farmers however regard the in-kind credit to grow cotton as essential and would not like it to be discontinued.

The seventh and last objective, was to investigate whether cooperative credit in-kind has had a positive impact on the welfare of Nkondi smallholders.

The finding of this research with respect to objective seven is that the cooperative in-kind credit has had very positive influences on the welfare of the farmers studied.

There is evidence from the study area that credit cooperative societies can accelerate growth of small farm investments and incomes through their extension of credit to small farmers. There is also evidence that a very high level of management in the cooperative society is not essential for the success

of a cooperative credit program among small-scale rural farmers.

In contrast with in-kind credit, cash credit has been found to be of limited use in increasing farm income and investment. The insignificance of cash credit in sampled smallholdings is probably due to the fact that it is available in very small quantities. It seems that its role in small farm sector, needs to be examined more closely.

II. PROPOSALS FOR ACCELERATING AGRICULTURAL DEVELOPMENT IN THARAKA

On the basis of the findings of this study, we recommend that the following proposals be implemented to raise productivities in Tharaka farms.

1. Provision of in-kind credit in Tharaka should be intensified and diversified. This means an increase in the volume of in-kind credit and an expansion in its variety so that it can include inputs for growing other crops in addition to those provided for growing cotton.

The Ministry of Agriculture staff in Tharaka should work in liaison with the Meru Cotton Growers' Society (the Society) to ensure that farmers are loaned the right type of farm inputs.

For the above arrangement to work properly, the Ministry of Agriculture Headquarters in Nairobi should support and coordinate the joint efforts of its staff and the Society in extending credit to farmers. In particular, the Ministry should ensure that the Society gets sufficient inputs to lend to farmers at the right time. It must also ensure that its field staff is competent to advice the Society on the credit needs of the farmers.

2. Land adjudication in Nkondi Settlement Scheme should be completed without further delay and land title deeds issued to farmers.

Title deeds will enable farmers to offer their land as security for loans and thereby be able to borrow funds from the A.F.C. and the Commercial banks. Such loans will

enable them to purchase farm inputs and equipment that the Society cannot provide, or provide in insufficient quantities. As this study has shown, an increase in farm capital stock will lead to a rise in farm productivities.

3. Farm demonstrations by agricultural staff should be used as a major strategy of inducing farmers to adopt new crops and improved farm practices. The experience of Nkondi farmers with the field staff of the Ministry of Agriculture supports the adoption of the above strategy. Most Nkondi farmers who planted new crops during the agricultural season ended March 1976, did so as a result of their contacts with the agricultural extension staff.

4. Cash crop production should be diversified. At present, cotton is the only major cash crop in Tharaka. The present intensification of cotton production suggests that farm incomes in Tharaka will in future be dependent largely on cotton crop. This in fact will be the case because no serious efforts are

being made to introduce other cash crops in this area. The danger here is that if the world price of cotton falls, Tharaka farmers will experience drastic reductions in their farm incomes. To insure against this risk, additional cash crops should be introduced in Tharaka.

Sunflower has already been introduced on a very small scale, but enthusiasm to grow it is lacking among farmers because its marketing system is very poorly organised.

The Ministry of Agriculture should therefore authorise the office of Maize Produce and Marketing Board at Meru to provide an organised marketing system for Tharaka sunflower. Production of groundnuts and castor seeds should also be encouraged by a similar arrangement.

5. Convenient saving institutions, notably the mobile banks and the Post Office, should be introduced in Tharaka to acquaint farmers with financial dealings and also to mobilize their cash hoardings. Such institutions are

likely to induce increases in farmers' personal savings and thereby reduce their need for credit.

III. IMPLICATIONS OF STUDY FINDINGS TO KENYA AGRICULTURE

The findings of this study are, applicable to many agricultural areas in Kenya for a number of reasons.

First, the bulk of Kenya's arable land is of low productivity on account of its unfavourable climate. This study was carried out in such an area.

Second, the bulk of Kenya's agriculture is small-scale. The farmers that provided data for this study were all small farmers. Third, credit is one of the strategies being used to speed up agricultural development in Kenya. This study was concerned with the role of credit in farm development. With these few remarks, we conclude that this study is relevant to Kenya agriculture and it implies the following:

(1) That in-kind credit can be used to raise the overall productivity of Kenya agriculture.

(2) That Cooperative Societies are the most appropriate institutions of channelling this credit to the rural smallholders.

Quite a good piece of work Mr. Mwabu (BA, B Com, MA)

NB. Very good But incomes accruing from and on which farmers based their preference for credit did not take Costs into account. They were Total Revenues However, farmers may well have benefited although perhaps not as much.

Footnotes:

1. The National per capita GDP for Kenya is at present £68 - Government Printer, "Development Plan 1974-1978, Kenya", pg. 17. The rural per capita GDP is around £24, ILO Report on Employment, Incomes and Equality: A Strategy for Increasing Productive Employ,ent in Kenya, International Labour Office, Geneva, 1972, p. 333.

2. Government Printer,"Kenya Population Census, 1969 , Volume I"

3. Survey of Kenya, "Chuka Administrative Boundaries, Sheet SA-37-2".

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5. Judith Heyer, "Some Problems in Valuation of Subsistence Output", 1965, IDS Discussion Paper No. 14, University of Nairobi.

6. United States Agency for International Development (USAID), "Spring Review of Small Farmer Credit," June 1973, Volume XIX, No. SR 119.

7. G. Bannock, R.E. Baxter and R. Rees, "The Penguin Dictionary of Economics", Penguin Books Ltd., 1972, p. 163.

8. J.C. Van Horne, "Financial Management and Policy", Prentice-Hall International Editions, London 1972, p.6.

9. Ibid., p. 9.

10. Ibid., pp. 6-7.

11. Ibid, p. 4.

12. Government Printer, "Development Plan, 1974-1978, Kenya", Part I, pp. 202-213.

13. Ibid., p. 213.

14. Ibid.,pp. 197-9.

15. G.F. Donaldson and J.D. Von Pischke, "Survey of Farm Credit in Kenya".

16. Ibid., p. 6.

17. Ibid., p. 6.

18. Ibid,,pp. 1-2.

19. Ibid., p. 3.

20. Ibid., p. 3.

21. J. Vasthoff, "Small Farm Credit and Development: Some Experiences in East Africa with Special Reference to Kenya", Afrika-Studien 53, JFO-Institut fur Wirtsckaftsforschung, Munich, Weltforum Verlag, p. 112.

22. Ibid., p. 113.

23. Judith Heyer,"Agricultural Development and Peasant Farming in Kenya", Ph.D.,/London / Thesis 1966 (Microfilm).

24. Ibid., p. 81.

25. Op.cit., p. 81.

26. Judith Heyer, "Smallholder Credit in Kenya Agriculture", IDS Working Paper No. 85, University of Nairobi, p. 23.

27. Peter Wyeth, Reastus Mbugua and S. Schonher, "Crop Production in Vihiga/Hamisi", Chapter 7 IDS Occasional Paper No. 12, University of Nairobi.

28. Ibid., p. 21.

29. Op.cit., p. 34.

30.

31. Diana Hunt, "Agricultural Credit in Uganda", Ph.D. Thesis, University of East Africa, 1967, p. 279.

32. Uma Lele, "The Design of Rural Development," Lessons from Africa, World Bank Research Publication, Chapter 5, pp. 81-99.

33. J.D. Von Pischke, "A Critical Survey of Approaches to the Role of Credit in Smallholder Development" Article in the "Financing Rural Development", edited by Frank A. Wilson and Victor F. Amann; Proceedings of the East Africa Agricultural Economics Society Conference University of Zambia, Lusaka, Zambia, May 22-25, 1974, pp. 2-3.

34. Ibid., pp. 18-19.

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SMALL-FARM FINANCE QUESTIONNAIRE

rea Code: .....

CTION I: HOUSEHOLD INFORMATION

. How long have you lived on this farm? .....

. Did you ever go to school? Yes..... No.....
If yes, what standard or form did you reach?
Standard: 1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐
Form: 1☐ 2☐ 3☐ 4☐ 5☐ 6☐

. Have you ever attended other courses or training of any sort?
Yes..... No.....
If yes,
Where did you go and what courses did you take?

Institution Attended	Courses taken	From	To
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

a. Are you married? Yes..... No.....
If yes,
How many wives do you have? Number.....

b. Do they all live in this home? .....
If no, how many do not stay here? Number.....

Now I am going to ask you about the ages of your children who live within this home.

a. How many are:
Under 7 years? Number.....
Between 7 and 15 years? Number.....
Over 15 years? Number.....

b. Do you have children who do not live with you? Yes..... No.....
If yes, how many? Number .....

. Do you have relatives living with you? Yes..... No.....
If yes, how many do live with you? Number.....
Do they depend on you or they support themselves?
Depend on me..... Support themselves.....

.e. Are any of your children in school? Yes..... No.....

If yes, tell me the type of school they attend and the fees you paid last year?

School	Number	Fees paid last year
Primary school	.....	.....
Secondary school	.....	.....
Other (specify)	.....	.....

ECTION II: FARM OPERATIONS, ASSETS, PROJECTS AND INVESTMENTS

.a. How big is your farm? Acres.....

b. How many acres do you have under crop cultivation? acres.....

.a. Do you grow crops for sale only? (cash crops)

If yes,

What crops	Acreage
.....	.....
.....	.....
.....	.....
.....	.....

b. What foodcrops do you grow?

Foodcrop	Acreage
.....	.....
.....	.....
.....	.....
.....	.....

a. Are there crops that you grew last season for the first time? Yes....No....

If yes,

Which crops? .....

.....

b. How did you know about them? .....

).a. Do you keep livestock on this farm?
If so, how many of the following do you have?

Type of Livestock		Number Owned
Grade:	bulls or cows	.....
Local:	bulls	.....
	oxen	.....
	milk cows	.....
	calves	.....
	sheep	.....
	goats	.....
	donkeys	.....

Total number of your cattle .....
Total number of your goats and sheep .....

b. Do your animals graze in the farm or away from the farm?
in the farm..... away from the farm.....

If in the farm,

c. How big is the area on which they graze? acres.....

d. Is that enough for them? .....
If no , which of the following did you do last year to get more pasture for your cattle:

(1) bought more land.....
(2) hired pastureland away from the farm.....
(3) bought fodder.....
(4) shifted cattle to another place.....
(5) sold some animals .....
(6) other (specify).....

.a. Do you have plans to make improvements on this farm over the coming season or the next few years? (probe) Yes..... No.....

b. If yes, what plans do you have? .....
.....
.....
.....

c. If no, do you feel your farm is as good as you would like it to be?
Yes..... No.....

d. If no, what do you think should be done to make it better?

.....

.....

.....

2.a. Is your farm fenced? Yes..... No.....

If no, go to question 12(f)

If yes,

b. How much of it is fenced? acres.....

c. With what material? .....

d. When did you fence it? Year.....

e. How much did the fencing cost you? shs. .....

f. Do you think it would be useful to fence your farm? Yes..... No.....

If yes, how would it be useful?

.....

.....

3.a. Do you have sheds for cattle on your farm? Yes..... No.....

If no, go to question 13(b)

If yes, when did you build them? Year.....

At what cost? shs. .....

b. Do you think it would be useful to have cattle sheds? .....

If so, in what ways would it be useful? .....

.....

.....

c. How many storehouses do you have on this farm? number.....

d. Are their roofs made of thatch or iron sheets? thatch.....iron sheets.....

e. Are you planning to build any crop storage next season? Yes.....No.....

f. What other constructions or buildings do you have on this farm?

.....

.....

.....

4.a. Which of the following farm equipment do you have? Also tell me their cost and whether they are in a good or bad working condition.

Equipment	Number owned	Cost (shs)	Working Condition Good	Bad
Wheelbarrow				
Ox-cart				
Tractor				
Ox-plough				
Cotton pump				
Cattle spray pump				
Other, specify				
.....				
.....				
.....				

b. Is it easy to find somebody to repair farm implements around here when they break down? Yes..... No.....

c. Did you open up new land last year? Yes..... No.....
If yes, what equipment did you use?
(1) tractor ☐ (2) ox-plough ☐ (3) handhoe ☐ (4) other, specify ☐

d. Since last year, what steps have you taken to conserve water in your farm? Probe. (dug a water furrow, began terracing, etc.)
.....
.....
.....
.....

e. In some areas farmers complain that good soil on their farms is carried away by water or wind. Do you have the same problem here? .....
If so, what have you done since last year to stop good soil from being carried away from your farm? .....
.....
.....
.....

ECTION III: SOURCES OF NON-CREDIT FINANCE

6.a. How much cotton did you sell last year? bags/kg. .....

b. How much did the sales fetch? K. shs. .....

7. Apart from cotton, did you sell other crops last season?.....

If so, what crops?

Crops sold	Receipts (K. shs.)
.....	.....
.....	.....
.....	.....
.....	.....

8.a. Are you currently employed for a wage? Yes..... No.....

If yes, go to question 19.

b. If no, have you ever had a salaried job? yes..... No.....

If yes, what type of a job did you have? probe: clerk, teacher, carpenter, etc. .....

c. What was your salary when you left the job? K. shs.....

9.a. What is your employer? .....

b. What would you say your monthly salary ranges from?

(1) K.shs. 0 - 49 (2) 50 - 99

(3) " 100 - 199 (4) 200 - 499

(5) " 500 - 1000 (6) Over 1,000

0.a. Do you have children or relatives working away from home?

Yes..... No.....

If yes, do they send you money? .....

If so, how often?

(1) Every month ☐

(2) Every three months ☐

(3) Two times a year ☐

(4) Once a year ☐

b. Do you have other sources of income apart from the ones mentioned above (probe: shopkeeping, building, chair-making, livestock trading, etc.) If so, what are they?

.....

.....

.....

1. What would you say your income is from these other sources:

Between. (1) 50 and 100/-.....

(2) 101 and 200/- .....

(3) 201 and 400/- .....

(4) 401 and 800/- .....

(5) Over 1,000/- .....

2. Do you have an account with any of the following?

(1) Post office .....

(2) Cooperative society .....

(3) Commercial bank .....

(4) Insurance company .....

(5) Other, specify .....

ECTION IV: OBSTACLES TO FARM INVESTMENTS

3. Do you hire labour? ..... If yes, how much did you spend on it last season? ..... K. shs.

4.a. How far do you travel to sell your farm produce? miles.....

b. What do you use to transport your crops there?

(1) bus/lorry ..... (2) landrover.....

(3) ox-cart ..... (4) bicycle .....

(5) human labour ..... (6) other, specify ....

c. How much did it cost you to transport cotton to its buying centre last year? K. shs. .....

d. Have you ever been unable to sell your cotton for lack of transport? Yes..... No.....

If yes, what did you do with the cotton for which you missed transport?

(1) Sold it later .....

(2) Threw it away .....

(3) Kept it in store .....

(4) other,(specify) .....

5. Did any of your crops (in the fields or in store) get spoilt or destroyed last season? Yes..... No.....
If yes, what crop was destroyed and by what?

Crop	Destroyed by what?
.....	.....
.....	.....
.....	.....
.....	.....

SECTION V: SOURCES OF CREDIT FINANCE

6.a. Since last year, did you borrow any money? (not insecticides) Yes..... No..... If yes, from where (probe: from shops, banks, relatives, cooperatives, AFC, KFA, etc.) and for what purposes?

Source of loan	Amount K. shs,	Used for what?
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

b. What interest rates were you charged on loan principal(s) .....

c. Have you begun repaying the loans?.....
If so, has money been available to meet repayments as they fell due?
Yes..... No.....
If no, have you been unable to meet repayment at any one time? Yes....No.....
If no, how did you get the extra money to meet repayment?.....
.....
.....

7. a. Since last year, have you also lent money to people? Yes..... No.....
If yes, what did the borrowers say they were going to do with the money?
.....
.....

b. Have all the people to whom you have lent money paid you back? .....
If not, how much has not yet been paid? K. shs.....

c. Now I am going to ask you questions about the in-kind credit that you get from the Meru Cotton Growers Cooperative Society. .....
.....
.....

28.a. How many cartons/packets of insecticide did you borrow last season?
Number .....

b. What was their value? K. shs. .....

c. What interest rate were you charged? .....

29.a. Have you ever had a pump loan from the cooperative? Yes.... No.....
If yes, what year did you get your first pump loan? Year.....

b. How much was it? K. shs.....

c. Have you completed repaying the loan? Yes..... No.....

d. At what interest rate did you get this loan? .....

30.a. Since last season, have you borrowed anything else from the cooperative society apart from the insecticides and pump? .....
If so, what have you borrowed, what is its value and what have you used it for?

Item borrowed	Value K.shs.	Used it for what?
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

SECTION VI: USE OF COOPERATIVE IN-KIND CREDIT

31.a. How many times did you spray your cotton last season? Number.....

b. Did you use all the insecticides you had borrowed? Yes.... No.....

If no, what did you do with the remainder
(1) Sold it for cash .....
(2) Gave it free to other farmers .....
(3) Used it to hire cotton pump .....
(4) Kept it for use in the following season .....
(5) Other, specify .....

c. Do you use cotton insecticide to spray other crops?
Yes/No
If yes, which crops? .....
.....

52.a. Was the insecticide that you borrowed enough to spray all your cotton?
Yes..... No.....

b. If no, did you do anything to get additional insecticide to spray all your cotton? Yes..... If yes, how much additional insecticide did you get?
.....

c. Where did you get it from?

(1) Bought it from a shop.....
(2) Bought it from my friend or another farmer .....
(3) Got another loan .....
(4) Other, specify .....

d. Had you sprayed your cotton before you received last season's insecticide loan? Yes..... No.....
If from questions 11 and 29, A FARMER HAS A COTTON PUMP, ask,

54.a. Did you rent your cotton pump last season to other farmers who do not have pumps? Yes..... No.....
If yes, how much did you charge them for using your pump?
Shs. ..... per acre sprayed.

If from questions 11 and 29, A FARMER DOES NOT HAVE A COTTON PUMP, ask,

b. Did you rent a cotton pump last season from other farmers who have pumps?
Yes..... No.....
If yes, how much did they charge you for using their pumps?
Shs. ..... per acre sprayed.

SECTION VII: ATTITUDES TOWARDS COOPERATIVE SOCIETY AND ITS IN-KIND CREDIT

55.a. After you had delivered (sold) your cotton to the cooperative society last year, how long did you wait before you got paid? .....

b. What farm operations were you performing while waiting to be paid?
(a) cultivating..... (b) planting..... (3) weeding.....
(4) other, specify.....

c. Has the cooperative paid you in full for the cotton you delivered last year? If not, how much does it still owe you? Shs. .....

d. What reasons were you given for this amount not being paid?

.....

.....

.....

36. Did you receive last season's insecticide loan on time? Yes.... No.....
If not, did the loan clerk tell you why the insecticides were late?
Yes..... No..... If yes, what did he tell you?

.....

.....

.....

37. If the cooperative were to stop giving loans for cotton spraying would you still grow cotton? Yes..... No.....
If yes, would you be able to find money to buy insecticides?
Yes..... No.....

38.a. Last year, the price of insecticides was high, This year it is even higher. Would you still accept a loan from the cooperative if the price of insecticides rises by:

(1) 10% Yes..... No.....
(2) 50% Yes.... No.....
(3) 100% Yes..... No.....

INTERVIEWER: In asking this question, convert percentage rises into shilling rises

b. If the cooperative were to give a discount of 20% for those farmers who bought insecticides for cash, what would you prefer; to buy from them for cash or to get them on credit from the cooperative
(1) cash purchase ..... (2) credit-purchase.....

SECTION VIII: CREDIT AND RURAL WELFARE

39.a. Since you began getting credit to grow cotton, do you feel you have become better-off or worse-off? (1) better-off..... (2) worse-off.....
Why do you say so?.....

.....

.....

40.a. Now tell me whether you have the following items and when you bought them?

Those which you have:

	Item	Year bought	Main source of finance
a.	Chair(s)		
b.	Mutungi(s) Bucket(s) Parafin lamp		
c.	Table(s)		
d.	Spring bed(s)		
e.	Radio(s)/ watch(es)		
f.	Bicycle(s)		
g.	Mabati roof(s)		
h.	Sponge mattress(es) Thermos flask(s)		
i.	Water tank(s)		

b. Do you think it is wise for farmers to continue borrowing insecticides and other farm inputs from the cooperative society?.....

Why do you say so?

.....

.....

.....

41. Now I have come to the end of the interview. But before I leave, tell me the greatest problems that farmers face in this area:

(1) .....

(2) .....

(3) .....

Thank you very much for your cooperation

COMMENTS: