
CHAPTER – 1

INTRODUCTION

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1.1 Statement of the Problem

Capital is generally very limited in developing countries. Schultz (1964) argues that in order to transform agriculture from a traditional state to a commercial one, more investment is required. Eckaus (1965) also shows how limited capital magnifies tendency to use inputs inefficiently. Baker (1965) maintains that capital constraints seriously affect agricultural production and that credit is strategic in attracting capital into agriculture. A change in technology, which is required in the transformation of agriculture, has much effect on credit needs in agriculture. All of these needs cannot be fully met by the farmer's own savings since his farm income is very low. Unless he gets some financial help from outside, he cannot make full use of technological development. Agricultural credit, therefore, is a crucial factor in agricultural growth.

Agriculture occupies a vital position in Nepal. It provides employment to about 80 percent of the total economically active population. The problem of low productivity is generally recognized in Nepalese agriculture. Most farmers are still using traditional practices.

Nepal is among the low economies of the world with per capita income of US\$ 240 (CBS: 2003). Agriculture is the mainstay of the economy, which accounts for 39 percent of the GDP (Ibid) and about 81 percent of the population depend on it for their livelihood. About 85.6 percent of the population lives in the rural areas and half of them below poverty level (Ibid). Thus the economy is overwhelmingly rural and agrarian. Agriculture, which accounts for more than 80 percent employment still remains underdeveloped. It has remained more or less stagnant for a long time. It is characterized by heavy dependence on weather and very low productivity.

Increase in agricultural production has to come mainly through improvement in productivity, as the scope for area expansion is limited. The development of agriculture is possible through the shift from existing tradition based subsistence system of farming to the profit oriented improved system of farming. Apart from some

inefficiency in the allocation of inputs for maximum profit, present inability of the Nepalese farmers to switch to the improved methods of farming stems from the lack of additional capital to finance such a shift. In this situation agricultural credit becomes critically important.

Agriculture is dependent upon outside finance for its development. It is a fact proved by history and evidenced by the appalling indebtedness of almost every person everywhere engaged in the industry of agriculture. In fact, the lesson of universal agrarian history is that an essential need of agriculture is credit. Neither the nature of land-tenure nor the position of agriculture affects the great phenomenon that the agriculturist must borrow due to the fact that an agriculturist's capital is locked up in his lands and stock. Hence, credit is not only essential but also inevitable and as such, it is not necessarily objectionable, nor a sign of weakness.

A huge investment of capital has become a distinct necessity on the part of Nepalese farmers to switch to the improved methods of farming. If new technology is adopted without adequate investment of capital, it may lead to far consequences than in traditional agriculture. Therefore, the new technology in the absence of necessary capital input would be like a high cost dam without field channels for irrigation.

The phenomenon has enhanced the demand for investible funds in Nepalese agriculture. The big farmers can meet this challenge of new technology more effectively. They have wider land and capital base and their dependence on outside finance is meagre. Unfortunately, however, they constitute only a microscopic minority in the farming sector. A majority of the Nepalese farmers who are to sustain the tempo of change in agriculture are small and marginal farmers. They are deficient not only in land but also in capital resources.

The small and marginal farmers have not benefited from rural development programmes. Their low land base and subsistence nature of farming yield pathetically a low income that is not sufficient even to meet their barest necessities of their life. In fact, their economy is characterized by chronic low income, malnutrition and vicious circle of poverty. Hence the question of saving and investment is practically inconceivable with these farmers. Consequently, they are compelled to depend upon outside finance to supplement their scanty resources to carry on their

farming and family operations. Thus, the borrowing from external sources becomes inevitable and in fact has become the way of life for many of the Nepalese farmers.

The factor described above, namely, the introduction of new technology to reduce poverty of the peasantry and salutary impact of credit on production has combined to produce a phenomenal growth of credit needs to Nepalese farmers. It is now widely recognized that for small holders who are at very low levels of living, provision of consumption credit is not only essential but also obligatory.

The need for consumption credit springs from two reasons. First, it enhances and sustains the efficiency of labour. Second, it ensures effective utilization of credit meant for production purpose. In the absence of adequate provision for consumption credit from the financing institutions most of the small and marginal farmers have to depend upon the moneylenders.

A further credit need arises from the risky nature of farm business. Risks of weather and natural hazards like drought, floods etc affect crop yields and income in a particular year. For farmers who are close to the margin of subsistence, it will be difficult to provide for such risks. They have necessarily to borrow from external sources for their operations and existence in bad years. In particular this trend imposes heavy responsibility on the financial institutions, which are expected to provide drought loans as well as consumption credit.

Besides the general shifters of demand function for farm credit there are other factors that influence it. Mention in this regard may be made of interest rate and price of the inputs. These emerging factors that go to increase the demand for farm credit and estimation of demand as the function of these forces offer new vistas for fruitful empirical research.

Estimation of demand for farm credit and meeting it through liberal supply of credit tells only a part of the story. What is however of supreme importance is that of the credit received should be productive and self-liquidating. The current farm business should be raised to such a level of efficiency and profitability that the farmer after paying interest and amortizing debts should have increased his assets and his capacity to produce as well as to maintain a reasonable level of consumption for himself and his family. The productivity of credit depends on how efficiently it is utilized in farm business. If the farmers make rational use of credit it would undoubtedly have a salutary impact on the economy of farmers.

With the introduction of improved techniques of production, cultivation is becoming more and more expensive. Farmers' own funds have been insufficient to meet the input needs of farms. Farmers, therefore, have to depend on borrowed funds to a larger extent. These funds are usually invested in various activities without knowing their marginal value productivity (MVP). This type of random investment usually prevents the farmers to reach at the maximum profit point. It is to be noted here that the magnitude of MVP measures the degree of adequacy/inadequacy of capital. Thus, higher the MVP, the higher will be the inadequacy of capital indicating thereby a better scope for investment. Credit extended on this would certainly increase the repaying capacity of the farmers and accordingly, the risk and uncertainty of repayment would be minimized. In the new cropping pattern, in addition to input, there will be more demand for credit. Therefore, the productivity of credit also becomes a researchable problem.

Agricultural credit in general and institutional credit in particular is becoming more important today than ever before, due to accelerated agricultural development activities. If increased production and higher productivity are the fundamental goals of agricultural development modern inputs such as improved varieties of seeds, fertilizers must be used. But these modern inputs must often be purchased with cash.

Normally demand for credit depends on the cost of credit on the one hand and marginal efficiency of capital on the other. But in agriculture like ours the constraints imposed by internal capital rationing cannot be assumed away. The latter is a consequence of a high degree of uncertainty faced by the farmers although certain social and cultural traits associated with the traditional societies also inhibit farmers from incurring debts. To the extent any of these constraints loosened, there is likely to be an increase in the demand for productive credit. The introduction of new technology will raise the marginal efficiency of capital. The prospects of high rates of return on capital may remove certain inhibitions restricting the use of credit. The entry of institutional agencies promises to reduce the cost of credit. All these developments will probably contribute to raising the effective demand for credit.

With stagnant agriculture where farmer's motivations are scuttled by low income prospects and risky situations demand for credit remains low. When agricultural development coupled with new techniques of production is initiated other determinants of demand become meaningful and the demand shifts. High fertility seeds, high level of fertilization, timely plant sanitation measures, new techniques of

processing and marketing are all cases in point. Farm assets enhance the scope for procuring credit and farm liquidity determines the quantum of credit required and offered. The actual demand is constrained by the cost of credit and the marginal efficiency of investment in farm activities. The entire gamut of factors of demand should ultimately depend upon managerial skills, ability and propensities toward risks in agriculture. Thus, the demand for agricultural credit varies by farm, by region and overtime. The determinants of demand for credit are liquidity, cropping pattern and cropping intensities, size of family and farm labour, cost of credit and mode of transactions, degree of risks and uncertainties involved in production and marketing inclusive of inventory control and managerial skills.

The supply of agricultural credit depends upon the level of saving and capital formation, degree of risks and uncertainties in lending and perspective of financial institutions. Where assets and liquidity are low, moneylenders seem to dominate of the credit market.

Providing appropriate finance for agricultural operations is like oiling agriculture to make its wheels move swiftly and smoothly. To foster progressive rural economy making available credit and ensuring its productive use should therefore form the basic planks of any credit policy.

Due to the lack of readily accessible natural resources in the country, the provision of agricultural credit is crucial to the survival and growth of the economy. It is widely accepted that credit facilities play a major role in improving quality of agricultural sector. Credit facilities to the small farmers ensure that they will get required inputs in time and the productivity will not be hampered unnecessarily.

After the adoption of economic liberalization policy mainly after the restoration of multiparty democracy in 1990, many financial institutions have come up in existence. But the access of credit through the formal financial institutional approaches is still quite low. The situation of rural credit is even more serious. There is a huge gap between demand and supply of rural credit. Despite having a wide network of different banks and financial institutions in the rural sector and implementation of many credit-linked poverty programmes, a large number of poor still remain outside the formal banking system. Similarly the perception of formal financial institutions regarding risk and cost implication in lending the rural poor is taken as a major

barrier. If we observe categorically we may find two major constraints, namely, outreach and sustainability.

Strengthening the provision of institutional credit for rural areas in an effective and efficient manner faces a number of issues now. Why, despite increasing efforts the coverage of institutional credit has not expanded in rural areas, especially to include the poorer segment of the population? Is it because of the inadequacy of rural branch network of banking institutions or because of their poor performance due to institutional, structural or policy problems? What are the major reasons for the continued dominance of the informal lending sources in rural areas despite relatively higher interest rates charged by them? How is credit linked with the supply being planned in the short-term and medium term to match the demand of rural sectors for rural development? Is there a need to restructure present rural credit institutions, policies and programs to make them efficient, effective and responsive to the needs of poverty alleviation?

Since there is large gap in literature providing answer to these very significant questions related to a vast section of the poor of the country, we find this point of time very appropriate to study the demand for credit and the productivity of credit at the farm level. However, given the time and resource constraints of an individual researcher, we have chosen Morang District for the purpose of an in-depth study. The proposed study is an in-depth analysis at micro level of requirements for credit and its use at the farm level and the factors, which affect the demand for credit and its productivity. However, we have also used some macro-level data wherever applicable.

We have enquired into the above-mentioned questions at two levels. First, we discussed at the level of the nation on the basis of the existing literature and the secondary data available to us. Second, by undertaking micro studies in nine Village Development Committees (VDCs) of Morang district of Nepal. As regards the choice of the study area for Morang District of Nepal, it has already been influenced by the fact that the researcher is an inhabitant of this district as well as due to the fact that the district happens to be primarily agricultural.

1.2 Conceptual Framework of the Study

The theory of economic development in agriculture is traced basically through three phases in the literature (Dhital: 1970). The concept follows essentially Rostow's

stages of development – emphasizing the traditional stage for take-off and the take-off stage. After take-off it appears that other sectors, not agriculture, will take the floor and 'drive' the economy to maturity and to the age of high mass consumption.

Mellor (1961) specify three distinct phases of agricultural development. In phase one, creating an environment suitable for change, making available knowledge of improved techniques and market outlets provides preconditions for agricultural development. In phase two, expansion of agricultural output takes place on labour intensive and capital-saving techniques supported by technological innovation. In phase three; agricultural production is increased through the use of capital intensive and labour-saving technology.

Wharton (1971), while synthesizing the 'staging models' brings them down to two stages—static and dynamic. He defines the static stage as one where motives for change is negative and agriculture is practiced for survival with bare necessities with the traditional techniques and decision making processes. The dynamic stage arrives when resources are fully used and technological change become dynamic and decision-making become rational, farming becomes commercialised and external economic forces begin to operate in agriculture.

The stage models and the concepts of development presented in the theories nevertheless help in examining the economy. They describe the characteristic of an economy rather than the policy means that would be required to affect a development process within the agricultural sector.

Thorbecke (1962) has presented a somewhat different analytical approach to agricultural development in so far as policy measures are concerned. In his framework of analysis, he has incorporated policy means that bring changes in agrarian structures in each phase of the development process and it can also indicate how changes in agrarian structure interact with other aims of economic policy. In the analysis of the agricultural sector, therefore, he has made an attempt to identify the defects in the agrarian sector that obstruct the process of development. He has applied Timmon's conceptual frame as an analytical tool in examining these structures.

According to Timmon the 'means—ends—continuum' is the framework of analysis that helps, identify, develop and test various structures in agriculture as variables in a development enquiry, which is policy oriented. The analysis proceeds with the

construction of a conceptual framework for identification and analysis of defects in agrarian structures. The analytical framework of the 'means -ends-continuum' concept proceeds in the following manner:

- a) Identifying the resources required for change in agriculture from traditional subsistence nature to modern commercialised one.
- b) Increase in agricultural productivity by efficient allocation of resources and
- c) Increase in per capita income of farm families.

Among the means are: agrarian return measures (fixation of rents, provision of permanent tenancy rights, a ceiling of holding, the saving of farm produces, providing employment opportunity out side of agriculture), agricultural reforms such as credit and marketing, research and dissemination of knowledge about improved agricultural practices.

T. W. Schultz (1965) has originated 'High Pay-off Inputs Model' and has popularised it through his work. According to Schultz, agricultural development must be based on the following foundations: First, new agricultural inputs that have a relatively high pay – off are required. Second, a supply of these inputs must be available to farmers. Third, as farmers accept them, they must learn them to use efficiently. The experience of the U.S.A. and Japan lends support to this approach. Empirical evidence indicates that the mainsprings of agricultural growth are shifts in production function resulting from the introduction of new inputs and production techniques.

The adoption of the high – payoff inputs model as the strategy for agricultural development involves among others, the fulfilment of certain conditions. Todaro (1977) has generalized them in the form of the following propositions:

Proposition I: Land Reform

Farm structures and land tenure pattern need to be adapted to the dual objectives of increasing food production and promoting a wider distribution of the benefits of agrarian progress. If the programmes of land reform can be legislated and effectively implemented then the basis for agricultural development will be established. But, the mere enactment and enforcement of an egalitarian land reform programme is no guarantee of agricultural and rural development if complementary government

programmes to transform the potentiality for improvement into actuality do not accompany it. This leads to the second proposition.

Proposition II: Supportive Policies

The full benefits of small scale agricultural development cannot be realized unless government support systems are created which provide the necessary incentives, economic opportunities and access to needed inputs to enable small cultivators to expand their output and raise their productivity. Land reform is most likely to be ineffective and perhaps even counterproductive unless there is a corresponding change in the rural institutions that control production (e.g., banks, moneylenders, seed and fertilizer distributors, etc.), supporting government services, (technical and educational extension services, public credit agencies, storage and marketing facilities, rural transport and feeder roads, etc.) and government pricing policies with regard to both inputs and outputs.

In a developing country like Nepal, the farmer constitutes the weakest agent of production as majority of them are still in practices at traditional agriculture. To switch to the improved methods of farming from subsistence nature of farming requires radical innovation in almost every aspect of farming practice.

As the present study forms part of the proposition II, it is necessary to examine the demand for, supply of and productivity of credit in the context of new technology.

The demand for farm credit differs widely depending upon the type of farming and the stage of its development. In a traditional agriculture capital plays a relatively less important role than land and labour. Finance in traditional agriculture is largely used for maintenance as distinct from expansion of agricultural activities. For example, here, problems of credit arise largely due to seasonal cycle of production, which is superimposed, on a steady pattern of consumption. The farmers have to spend on consumption and to some extent even on production inputs throughout the year, while returns from agriculture come normally at one or a few concentrated periods of harvest. This necessitates either a saving process from past income or borrowing (Lele: 1974).

Regarding savings, it is often argued that due to low incomes of farmers there is little saving in rural communities. The meagre savings are not commensurate with

the investment requirements of agriculture. Further, the paucity of intermediaries and the absence of institutional saving habits contribute to the low level of saving. Backward and stagnant technology of traditional agriculture tends to reduce the effectiveness of current investment and hence results in perpetuation of low incomes (Panikar: 1969)

Agricultural credit is only one of many factors playing a part in the complicated process of increasing agricultural production. Agricultural credit ceases to be an economic force facilitating agricultural development if it attempts to finance farmer that do not have a potentially adequate economic base. Agricultural credit, just being made available cannot promote development of and when connected with other aspect such as extension, technical assistance, efficient marketing and supply, it will become one of the most effective tools in bringing about progress in overall development of the country. Agricultural credit is also one of the most vital inputs in increasing agricultural production. Modernizing Nepalese agriculture requires a massive dose of financial assistance and the institutional credit

To meet the financial needs of agriculture and also to ensure that in a developing economy it serves as a dynamic factor, it is essential that a sound financial system be set up. Such a system will be one as would convert the present 'static credit' into a 'dynamic credit'. The static credit is defined as one under which at the end of the credit period, there is no increase in the output, income or in assets. The dynamic credit is one under which at the end of the credit period, there is an increase in output, income or in assets. In other words, the productivity of credit is increased. The issue here raised is that it is necessary not only to meet the growing credit requirement in a developing agricultural economy but also it is equally important to set up an institutional structure that will take an integrated view of the various requirements of the farmer and enable him to organize his farm business at a higher level of technical efficiency on sound economic basis.

1.3 Objectives of the Study

The fundamental objectives of this study are to identify variables determining the demand for farm credit and assess the productivity of credit utilized particularly

relating to the sample area and Morang District in general. In relation to this basic objectives other objectives are set as under.

- a. To derive the demand function for short-term farm credit based on the collected samples.
- b. To investigate the relationship between demand for short-term farm credit and the rate of interest.
- c. To evaluate the productivity of credit in the sampled area.
- d. To study the operational and financial performance of rural credit institutions.
- e. To pinpoint whether the economic status of beneficiaries has gone up or not on the basis of the collected data.
- f. To make an assessment of agricultural development during different plans of Nepal.
- g. To suggest the corrective measures to be taken further to evolve realistic credit policies

1.4 Importance of the Study

The findings of the study would shed light on the existing pattern of farm credit use and its impact on the economy. They would enable the financing institutions and policy makers to evolve more realistic credit policies. In this sense the study will have significant policy implications. Furthermore, the evaluation of productivity of farm credit in this study would enable the farmers of this region to utilize the credit optimally.

1.5 Scope of the Study

- i. This study includes only crop production as practiced on the holdings by the farmers but it does not include other allied activities such dairy, fishery, poultry, pisciculture, horticulture etc.
- ii. Farm credit is taken to mean only short-term credit for farm use and its supply by major formal lending institutions.
- iii. The reference period of this study is limited to two fiscal years from 2000/01 to 2001/02.

1.6 Hypotheses of the Study

The foregoing discussions suggest that the demand for short-term credit at the farm level is influenced by several factors. It is also believed that the credit employed tends to exert positive influence on farm output and income. More specifically, the following hypotheses are formulated to study the significance of different variables determining the demand for farm credit and productivity of credit utilized by the farmers in different areas depending upon the level of development and size of farmers.

- a) There has not been any significant improvement in the agriculture sector during the different plan periods.
- b) The performance of rural credit institutions is not satisfactory.
- c) The amount of short-term credit required at the farm level is dependent on the value of purchased inputs and amount of consumption expenditure incurred.
- d) Farm investment is largely dependent upon the availability of external finance.
- e) The rate of interest exerts marginal or no influence on the demand for short-term farm credit
- f) The use of credit in farm operations increases farm output.
- g) Credit is not optimally allocated in farm operations.

1.7 Research Questions

In order to study the stated problems we have framed the following research questions:

- i. What is the origin of institutional credit in Nepal?
- ii. What are the determinants of the demand for short-term farm credit?
- iii. Is demand for short-term farm credit influenced by the rate of interest?
- iv. Is it not possible to make investment by the small farmers themselves without external finance?
- v. Is it a fact that the use of credit increases farm production?
- vi. What kind of relationship is there between price of input and the demand for short-term credit?
- vii. Do the farmers allocate the credit optimally in the farm?

- viii. Is the performance of rural credit institutions satisfactory?
- ix. What are the major problems of marginal and small farmers?
- x. Why do the large farmers take loans from the formal credit institutions?
- xi. What is the asset holding position of marginal and small farmers?
- xii. Why, despite the relatively cheap rate of interest available, marginal and small farmers take loans from the moneylenders at a relatively higher rate of interest?
- xiii. Is there any significant improvement in the agriculture sector during the plans of Nepal?
- xiv. What major conclusions can be drawn from the whole study?

1.8 A Brief Overview of Literature

Here we provide a brief resume of concepts and earlier research efforts to the empirical estimation of demand for farm credit, productivity of credit, farm investment and other associated concepts of farm credit.

1.8.1 Demand for Farm Credit

Credit Defined

In general, credit signifies the temporary means of raising funds for meeting various obligations. Beckman and Bartals (1955) define credit as "the power and ability to secure goods or services in exchange for a promise to pay for them later". Mellor (1966) defines credit "as the device for facilitating the temporary transfer of purchasing power from one individual or organization to another". Rajagopalan (1968) defined agricultural credit as the investible funds made available for the purpose of development and sustenance of farm productivity. According to him, farm credit is different from farm liquidity. Liquidity means, according to him, the level of investible funds available with the farm households. In the opinion of Cummings (1971) credit is one that permits the cultivators to enjoy the production benefits of new technology now and defer payment until after the output is realized. Poudel (1986) defines agricultural credit as the amount of investible funds made available for the purpose of development and sustainability of farm productivity.

The viewpoints stated above indicate that credit entails a contract between the farmer and an outside source whereby purchasing power is transferred temporarily to the farmer. This transferred money enables the farmer to implement his farm plans

more effectively. In the present study the credit is defined as the amount of loanable funds made available for potential borrowing. These funds when borrowed are payable in future with an interest agreed to pay explicitly or implicitly. Further, this study classifies credit into short-term production credit, long-term investment credit and consumption credit.

Requirement and Demand

In the literature on farm finance, the terms credit requirement or need and credit demand are used synonymously. However, there is a subtle difference between the two.

Credit need represents only the innate desires of the farmers to borrow and this desire is based on the financial needs of the family and the farm. When this desire is backed by returns, repayment capacity and risk bearing ability of the farmer, it becomes demand for farm credit. According to Srivastava (1978), effective demand is said to exist when the creditor has the confidence in the future solvency of the borrower and his repayment capacity to return the loan as per the terms and conditions of the loan agreement. However, if this definition of demand for farm credit is adopted, the financial needs of most of the small farmers who have less returns and less risk bearing ability, would not constitute demand for farm credit. But investment of credit brings additional income and enhances repaying capacity and bearing ability of the farmers. Since credit policy of most of the institutions in Nepal is to base their assessment of repaying capacity of farmers on this prospective income, using the above definition of demand for credit does little violence to the concept.

Demand for a factor of production differs from the demand for final product in the sense that while the former is a derived demand, the latter is a direct demand. The demand for final products reflects directly the utility attached to them, but the demand for factors of production does so indirectly being derived from the demand for the final product. There is a strong link between the demand and price of the final product and those of the factors of production. For example, a rise in the price of the final product will be followed by a rise in the demand for factors (inputs), which help to produce that product.

Like any other input demand, the demand for farm credit is a derived demand. It is derived from the desire to undertake investment expenditures, which in turn is derived from the demand for the agricultural products of the farmer. In this sense

changes in the demand for farm credit may be explained by the shifts in agricultural production function directly. A rational farmer first derives demands for various inputs given the technology and product factor price ratio. If the required inputs can be purchased with investible funds available on farm, he requires no credit. Therefore, demand for credit depends on the value of inputs to be used and own finance available with the farmer. Roughly, it is the difference between planned expenditure on farm and non-farm-finance. Therefore, demand for credit is derived from derived demand for farm inputs. In other words, demand for credit is indirectly related to farm production (function).

Elasticity of Demand for Credit

It is assumed that farmers' decision to borrow to be influenced by the prevailing rate of interest. Therefore, the demand relationships can be summarized in terms of the interest elasticity of demand, which measures the responsiveness of demand for farm credit to changes in interest rates. The concept of interest elasticity of demand has significant policy implications. In the past, several authors have attempted to examine the nature of interest elasticity of credit demand in Indian agriculture.

Pani (1966), after an analysis of the data of all India credit survey of 1951-52, reported that the average cultivators' demand for farm credit is not wholly interest inelastic. His analysis revealed that for every point rise in interest rate the demand for credit declined by Rs 4 to Rs 6, other things remaining the same. He observed a curvilinear relation between demand and interest rate. The study of Roy and Magi (1978) based on a sample of 60 farms in Hoogly district of West Bengal revealed that the introduction of new technology in agriculture brought a more inelastic demand for farm credit implying that the necessity of credit has far surpassed interest considerations in recent years. They have used parametric linear programming technique to derive the step demand functions for borrowing.

Kumar et al (1978) estimated credit demand functions on the basis of unit output price (UOP) profit function approach for the marginal farmers of Moradabad district in Western Uttar Pradesh for three different seasons. The outcome of this study pointed out that prices of inputs and outputs alone influenced the demand for farm credit rather than interest rate.

It is evident from the results of the above studies that the demand for farm credit is interest inelastic. This study also assumes an interest inelastic demand for farm

credit in the short run because it usually takes time for demand to adjust fully to an interest rate change. Further, farmers' decision to borrow is not influenced by the interest rate considerations when the rate of return on additional credit employed in growing the new varieties tends to be considerably high. The study of Schluter and Parikh¹ (1974), among others, supports this contention. In view of the inelastic nature of credit demand, it is assumed that even the adoption of a dear credit policy may not harm agricultural operations. Ramadass and Sebastian (1979) argued for a dear credit policy on the following grounds (i) the demand for unproductive credit will contract (ii) available scarce credit will be put to best uses (iii) the scope for mobilization of deposits will increase (iv) with lesser demand and large supply of credit, the credit gap will disappear eventually and (v) additional income through interest rate to the institutions will provide enough protection against risks arising from bad debt.

Dantwala (1968), Ladman (1971), Food Agricultural organization (1971), Thingalaya (1978), had also argued either against the lower interest rate or subsidizing rate of interest for agricultural purposes. Their arguments are (i) liberal credit is helpful but cannot by itself make an intrinsically non-viable enterprise viable. What is wanted is the right quantity of credit at the right time, (ii) the high marginal value productivity of capital justifies higher rate of interest (iii) the low rate of interest will not be sufficient to meet the cost of obtaining the funds and (iv) if the farmers are to be helped, they should be helped by improving agricultural extension services, co-operatives and marketing facilities than by subsidizing rate of interest.

Factors Determining the Demand for Credit at the Farm Level

Macro level estimates of demand and the methods used in them are based necessarily on several restrictive assumptions and fail to take account of inter farm differences in resource endowment and decision behaviour of the farmers. Therefore, the micro level estimates are essential and an assessment as the factors determining demand become necessary. In the past some studies were conducted on this aspect and they are reviewed here briefly.

According to Rajagopalan (1968), the demand for farm credit at the micro level is determined by liquidity, cropping pattern, cropping intensities, size of family and farm labour, cost of credit and mode of transactions and degrees of risks and uncertainties. Use of high fertility seeds, high level of fertilization, timely plant

sanitation measures, new techniques of processing and marketing will shift the demand for farm credit. Farm assets will enhance the scope for procuring credit and farm liquidity will determine the quantum of credit required and offered. The actual demand is however constrained by the cost of credit and marginal efficiency of credit.

In an attempt to forecast the demand for short-term credit of farms in the selected districts of Andhra Pradesh, Sharma and Prasad (1978) identified two major sets of variables determining the demand for credit, namely, economic and technological. The economic variables included the size of operational holding, extent of irrigation, intensity of cropping, cropping pattern and the productivity per hectare. Technological variables included the use of oil engines and electric motors, tractors, fertilizers, pesticides and percentage of area under High Yielding Variety paddy to total paddy. The dependent variable was credit per hectare of gross cropped area.

In a study to assess the short term credit needs in respect of few primary inputs like seeds, fertilizers, pesticides and manual labour, Desai (1978), found the rise in prices of inputs and the change in the character of inputs as main determinants of demand for farm credit.

Various methods and models by different authors on the other hand have established the relationships subsisting between the determinants of demand for farm credit on the one hand and the credit demand.

The model of Singh and Gupta (1971) to estimate the demand for farm credit at micro level is

$$Y_i = R_{ij} \sum_{j=1}^M P_{ij} X_{ij}$$

Where P_{ij} and X_{ij} are capital inputs per acre and area under j th crop on i th farm situation respectively, and R_i is the proportion of credit to the capital inputs on i th farm situation. R_i is assumed to be 0.50, 0.45 and 0.40 for small, medium and large farmers respectively. This procedure was adopted for the estimation of short-term credit requirements in Barauliahir Block in Agra District.

Girija Shankar and Sri Vastava (1976) estimated the credit demand by multiplying the credit gap or need by the corresponding hectareage under the crop. The credit need or gap was estimated by the following formula

$$C_n = V_r - V_u$$

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Where C_n denotes credit need, V_r denotes the value of recommended level of input use and v_u represents the value of input used in rupees. The scale of finance was taken as the value of recommended inputs. Changes in market prices of inputs were taken care of in assessing the scale of finance. Value of the recommended inputs was valued at average retail prices prevailing in the locality. Using this approach they determined the credit needs of High Yielding Variety (HYV) paddy of sample farms of West Godavari district.

In a study Desai (1978) used the concept of elasticity of credit to assess the demand for farm credit. Accordingly, he worked out the price elasticity of credit demand, which is given by the following

$$C_p = P_{it}/C_{it} \times dC_{it4}/dP_{it4}$$

Where C_p is price elasticity of credit demand, P_{it} is the price of i th input in t th period and C_{it} is the need for i th input in t th period. He has estimated the quantum elasticity of credit demand by using the following formula

$$C_q = Q_{it}/C_{it} \times dC_{it4}/dQ_{it4}$$

Where C_q is quantum elasticity of credit demand, q_{it} is the quantity of i th input in t th period and 'd' is change over the period that is $t...t_4$. Applying this methodology to the farm level data of three villages of Coimbatore and Salem district of 1973-77 he indicated that changes in the prices of fertilizers and pesticides had a greater bearing on the credit requirements than the prices of seeds, manures and labour.

To analyse the significance of factors determining credit demand also commonly adopt multiple regression technique. In a study cited earlier, Sharma and Prasad (1978) used the regression approach for forecasting the demand for farm credit. To find out the impact of each variable and to explain the regional differences in determining the demand, two variable regression models were obtained. In this process, the more important variables were identified in each district. A multiple regression model was tried to obtain the demand estimates. However, due to the problem of multicollinearity, they couldn't use the multiple regression models and hence selected only a two variable regression model.

In a study of the structure of agricultural credit in Pondicherry region, Ramadass and Sebastian (1978) employed multiple regression models. Cost of cultivation, consumption expenditure and value of gross produce were included as explanatory

variables. Their results revealed that the cost of cultivation and consumption expenditure were the significant determinants of demand for farm credit. This study also adopted the multiple regression approach and attempted to explain the relationship between demand for farm credit on the one hand and other explanatory variables like operational area, irrigation, family expenditure, value of purchased inputs, cropping intensity and percentage of institutional credit.

In a study, Sidhu and Baanante (1979) used the restricted profit function to estimate jointly the profit and factor demand functions for fertilizer. Their study revealed that output price was a more powerful policy instrument than fertilizer price. They also concluded that profit function is a suitable technique for empirical analysis and interpretation.

There was only one study by Kumar, et al (1978) that employed UOP profit function approach to the derivation of demand for farm credit. This study related to a sample of 50 marginal farmers from Amroha Block of Moradabad district in western Uttar Pradesh. The production function estimated by them included four variables, namely, variable input, cultivated land, family human labour and family bullock labour. They derived the optimal input demand quantity from a UOP profit function in its Cobb-Douglas form. From the value of optimal input quantities the value of resources owned was subtracted. The residual yielded the credit demand. Their findings showed that the demand for credit by the marginal farmers was inelastic and highly elastic with respect to prices of both inputs and outputs.

Farm Investment

Concept of Investment

Kurian (1969) defined capital investment as expenditure of rural households on items like reclamation of land, bunding and other land improvements, irrigation, agricultural implements and machinery, farm houses and storage and water houses. According to Tewari (1970), the term capital investment includes the value of owned land which is under cultivation, non-residential buildings on the farm, live stock, farm implements and miscellaneous.

In the view of Chouhan and Agarwal (1970), capital investment consists of agricultural and non-agricultural investments. Agricultural investment consists of investment on land, of livestock, irrigation, implements and construction of farmhouses and cattle sheds.

Several factors determine the behaviour of investment. Desai (1969) in his cross section analysis of a progressive and backward area of central Gujarat identified and analysed the factors like the size of operational holding, family size, net household income, extent of commercialisation, extent of irrigated area and current borrowing as determinants of investment. He calculated the coefficients of simple correlation of total investment in durable capital and non-durable capital for farming with above-mentioned factors. The notable conclusions of his study were: land was complementary with capital in both progressive and backward regions. Family size exerted low, insignificant and negative influence on durable capital in both areas. Net income was found to be a significant variable, which explained the differences in the behaviour of farmers in the two regions.

Mishra and Mallick (1969) after analysing three studies conducted in different regions, two in Andhra Pradesh and one in Orissa, reported that irrigation, urbanization and size of holdings exerted positive effect on agricultural capital formation. They also found that higher the income, the greater the percentage of it is devoted to capital formation. They worked out simple correlation coefficients between investment and other factors mentioned above.

Prasad (1969) in his study of two districts of Andhra Pradesh analysed the problem of investment variation from another angle, the influencing factors being divided into two broad groups, namely, internal and external. Internal factors included cropping pattern, resource position and managerial capacity. External factors included those factors, which create necessary infrastructure for further investment like construction of irrigation dam, provision of cheap credit and such others.

Shah and Singh (1969), studied the investment behavior of farmers in Terai Region of Uttar Pradesh. The amount invested on capital assets was found to be dependent on the level of technology and the size of holding. The regression equation run to find the relationship between capital investment and disposable income showed a positive and significant relation between the variables for progressive and large and progressive medium farmers.

Chouhan and Agrawal (1970) analysed the relationship between net investment per family with factors like age of the head of the family, size of the family and size of operational holding with the help of a multiple regression model. They found that age

of the head of the family and number of members in the family exerted significant influence on investment.

Radha Krishna (1972) explained investment as a function of investible funds, which in turn was assumed to be determined by per capita family and farm expenditures. He applied regression approach. He found that 90% of variations in capital formation was explained by investible fund in the study area. This study was conducted in Deltaic area of Palayam Kottan Block of Tirunelveli district.

Kuralnathan (1975) estimated an investment function with net cash income of the single explanatory variable for Dindugal area. He found through regression approach that net cash income contributed to the level of investment significantly. However, the value of r^2 was too low being 0.17.

Bhupindar Singh, et al (1978) in a study of capital formation in Haryana agriculture employed multiple regression technique to analyse the investment behaviour. The base year capital, farm size, family size and lagged income were the explanatory variables. They found that the coefficient of base year capital was negative which meant that at the farm level, higher the base year capital, lower would be the additional capital investment in the current period. The coefficient of farm size and lagged income were all positive.

1.8.2 Productivity of Credit

There exists a positive relationship between farm credit and the productivity. The impact of credit on the productivity of farm is expressed through marginal productivity of credit derived usually through Cobb-Douglas production function. Marginal productivity of credit is defined as the measure of the increase in total product with addition of one unit of credit above its mean level, while other resources are held constant at their mean levels. The past research work in regard to productivity of credit is summed up here.

Desai and Tanbad (1970) made a case study of the impact of syndicate bank loan on agricultural productivity. After analysing the data of 312 participant and non-participant farmers, they fitted a Cobb-Douglas production function to the data of 21 participant farmers. They found that every rupee of credit invested in cash and kind expenditures resulted in Rs.1.75 of the value of farm production.

In a study of 10 villages of Kalyanpur, Garg, et al (1971) analysed the productivity of credit. The regression analysis between credit and output per hectare revealed that the increase in cash input in the form of credit by one rupee resulted in an additional output of Rs. 2.12.

Sharma and Prasad (1971) examined the impact of credit on income of different size of farms of Tannai, Nainital and Rampur districts of the north- western regions of Uttar Pradesh. Linear programming technique was used to analyse the data. The empirical findings of this study indicated that an adequate use of credit increased the income substantially even at the prevailing state of technology. A situation of adoption of improved technology with adequate credit facilities almost doubled the income of the farmers.

Singh and Jha (1971) from their study of three villages of the union territory of Delhi reported that additional credit produced better results in terms of net returns when used with the advanced technology. They used linear programming technique for the analysis.

Vankataram (1975) analysed the behaviour of 51 farmers in Mandya district of Karnataka reported that a 50 percent increase in loan funds availability over the existing loan limits facilitated favourable conditions for adoption of new technology and also provided about 52per cent increase in net returns.

Mishra (1975) applied Cobb-Douglas production function to work out the productivity of co-operative finance for paddy, wheat, barley and potato crops in Pratapgarh, district of Uttar Pradesh. His results showed that the elasticities of production for crop loan were significant at 5per cent level in the case of wheat. The marginal productivity of credit varied from 1.44 in case of paddy to 2.29 in case of potato. Every rupee borrowed from co-operative society yielded a surplus of 44% in the case of paddy, 63% in barley, 88% in wheat, and as high 128% in potato.

Shankar and Srivastava (1976) in West Godavari district found that the per hectare yield from high yielding variety of paddy was positively related to per hectare availability of credit. The coefficient of correlation was found to be significant at 5per cent level and 2 per cent level.

Lavania et al (1976) fitted a Cobb-Douglas production function to the farm data of 59 farmers of Rajgarh Community Development Block of Mirzapur district to assess the productivity of co-operative finance. Short-term credit obtained from primary co-

operative society was included explicitly as an explanatory variable. The result revealed that the influence of credit on output was statistically significant at 1% percent. The marginal value productivity of credit for paddy was 2.40 while it was 3.01 for wheat. Further, the MVP of co-operative production finance compared favourably with the prevailing rate of interest.

Jasbir et al (1978) reached almost the same conclusion in their study of small farmers of Patiala district of Punjab. Linear programming technique was used to study the impact of credit on production and farm income for the two categories of farmers at the existing and improved level of technology with and without capital constraints.

Mishra (1980) studied production response of crop loan in four villages of Gorakhpur district. He applied Cobb-Douglas production function with output as dependent variable and manures and fertilizers, seed and size of farm as independent variables. His results revealed high marginal value productivity of inputs used out of bank loans. He also reported that the borrowers were able to increase their output by 39% over the non-borrowers.

Koirala (1981) tried to evaluate the impact of agricultural credit on farms in Rupandehi District of Nepal. He concluded that credit had a positive coefficient in all cases, especially higher in the case of improved rice and wheat. He further concluded that total production and net profits were found increased with successive addition of credit. This showed that credit was used to levels below the optimum.

Agriculture Project Service Centre (1987) conducted a comprehensive study in December 1987 regarding impact of the credit found several positive changes with the help of credit availed to small farmers. The study concluded that farm income grew by 19.5 percent during the project period or by 5.1 percent annually at the constant price of 1981/82. During the same period, off farm income increased by 68 percent and as a result household income increased by 30 percent or an annual increase of 8 percent at 1981/82 prices.

Tripathi, et al (1994) expressed their view that the contribution made by credit to agricultural income would depend upon the adequacy and efficiency of infrastructure and the agro-economic situation of the area. They concluded that the impact of the short-term crop credit is encouraging and provision of short-term crop credit is an effective way to increase the farm return.

Singh R.B. et al (2002) studied the impact of credit advances on main crops and milk production enterprises in Soraon block of Allahabad district of Uttar Pradesh. The study found that the borrowings made by the farmers helped them in making higher investment on their farms for different purposes. The study concluded that in the post- borrowing conditions credit advances made for different purposes have directly/indirectly resulted in a significant increase in agricultural income.

1.8.3 Efficiency of Credit

Economic efficiency implies some sort of optimising on the part of producers. Economic efficiency comprises both technical and price efficiency. Technical efficiency refers to the proper choice of production function among all those actively in use by farm in agriculture. Price efficiency on the other hand, refers to proper choice of input combinations. In this study the concept of price efficiency as applied to farm credit, is used.

A farm is said to be price efficient when it maximizes profits or net income, that is, it equates the value of the marginal product of each variable input to its price. The optimality rules for price efficiency can be developed in terms of single output-multi-input production function, such as Cobb-Douglas. By comparing the marginal productivities of inputs, derived from the production function with the prevailing market prices of the inputs, the efficiency in the use of the factor can be evaluated. This approach has been followed by most of the studies conducted for evaluating economic efficiency in Indian agriculture. Regarding the efficiency of farm credit, some of the studies conducted in India have adopted the same optimality conditions.

Singh, et al (1971) assessed the economic rationale of credit use between different inputs on the progressive and less progressive farms in Varanasi district of Uttar Pradesh. They reported that the progressive farmers were using the credit in the right direction along with its nearly rational allocation between fertilizers and owned irrigation equipment as reflected through nearly equal marginal return per unit of cost of credit in these two resources. They applied Cobb Douglas production function in their study. A similar approach was adopted by

Satapathy and Tripathy (2001) conducted a study in Cuttack Sadarblock of Cuttack district of Orissa. A two stage random sampling technique was employed to select the sample farmers. A sample of 97 farm households was selected. Cobb-Douglas production function was worked out to examine the efficiency of credit

financed and self financed inputs. The study revealed that the borrowers had used higher amount of critical inputs, which enabled them to obtain higher per hectare rice yield as compared to the non- borrowers using self-finance. As regards optimisation of resources the credit recipients could get maximum profit from rice production through optimum use of credit-financed inputs.

1.8.4 Risk Aversion Attitude

Risks may be attributed to natural, social and economic factors. The natural factors are: lack of moisture and drought, surplus moisture and floods, frost, hail, storms, fire, pests and diseases. Some of the social hazards are: fire, theft, embezzlement, changes in social structure and technological changes. Economic risks include fluctuations in the prices of agricultural products resulting in loss of income to farmers. Several studies carried out on risk seem to support the proposition that farmers are risk averse.

According to Bhinswanger (1978) an individual is a risk averter, if in choosing among alternative investments he is willing to forgo some expected return in order to reduce the probabilities of adverse outcomes. Roumassat (1979), on the other hand, defined farmers as risk averse if their utility function of income is everywhere concaves that is characterized by diminishing marginal utility of income. In his view, risk aversion arises because the consequences of gain and the farmers wish to avoid the consequences of loss.

Risk aversion has been actually measured with the use of principles like liquidity, profit maximization, and quadratic programming. Rajamani and Balasubramaniam (1979) constructed a risk aversion index based on the farmers, response to a set of eight questions relating to farm production, marketing and finance. This index considers the utility maximizing criterion in assessing the risk behaviour of farmers.

Risk aversion tends to exert a dampening impact on the use of capital and credit in agriculture. While examining the impact of risk aversion, Gale Johnson (1947), theorized that risk aversion on the part of farmers results in both internal and external capital rationing in agriculture. In turn this capital rationing affects the smooth transfer of capital to agriculture, which in fact is required to reduce the adverse effects of capital rationing.

Schultz (1953), while considering the relation between price uncertainty in agriculture and capital rationing supported the program of forward prices in

agriculture. He argued that because of price uncertainty and the attendant capital rationing many farmers are either unable or unwilling to commit themselves to contractual payment though there is need for additional resources to improve the efficiency of their farms. Consequently, there is more of substitution of human resources than of non-human resource in farm operation. This tendency reduces the per capita farm earnings and raises the rate of return on capital over the cost of capital. The excess of MVP of capital over its cost implies loss of efficiency and waste, in agriculture. This waste can be removed by ensuring price certainty through a system of forward prices for agriculture.

Some studies conducted in Indian agriculture also revealed the impact of risk aversion on capital and credit use. Agrawal (1964), after analysing various implications of risks and uncertainties, opined that risks and uncertainties might result in internal and external rationing of capital. Risks also affect the cost of credit and the amount and nature of securities required. The lenders would also prefer low risk areas to high-risk areas and the low risk enterprise to high-risk enterprise.

Kohlon and Johl (1964) in their study of Ludhiana district found that risk aversion compelled farmers to keep usually large proportion of liquid capital, which could be profitably used otherwise. They reported that on an average a cultivator held 33.5 per cent of the total liquid capital available to him in the form of resource fund. This proportion increased with the increased use of improved technology to 42.1 per cent and 52.6 per cent.

Tripathi and Naidu (1964) analysed the effect of risk and risk aversion on the demand and supply of farm credit. The unwillingness of the farmers to take risk in agricultural production limited the use of credit on the supply side, because of risks inherent in investment financed by the lender, the lender either had a tendency to restrict the supply of credit or enhance the rate of interest. This in turn resulted in under investment though there was a greater scope for profitable application of capital in agriculture. Mishra (1964) after describing various sources of risk like price, income and land reform concluded that the farmers would not invest costly capital on highly uncertain projects.

Schluter and Parikh (op.cit) in their study of Mahsana district of Gujarat found that farmers were unwilling to adopt new varieties due to uncertainty. Further, under conditions of high uncertainties, they were not willing to borrow from the traditional

sources of finance and adopt uncertain technology. Under these circumstances if cooperative credit were made available to the farmers, they would adopt new technology. The regression model tested by them also showed that only those farmers who were able to avail co-operative credit were bear to uncertainties and adopted new varieties.

In another study of 120 farmers of Surat district, Schluter (1974) found that lack of working capital in irrigated farms and uncertainty in un-irrigated land were the main deterrents to this adoption of high yielding varieties. He concluded that the availability of credit in irrigated farms and greater flexibility of loan repayment on un-irrigated farms would lead to adoption of HYV.

Subha Rao (1980) analysed the nature of constraints on the demand for short-term co-operative production credit in Eastern Uttar Pradesh. He attributed the consequences of production uncertainty to the lower absorption of co-operative credit in the study region. In this study we have made an attempt to know whether farmers are risk averse or not.

1.8.5 Interest Rate

Several authors analysed the component of interest rate in the underdeveloped agricultural areas. Bottomley (1964) underlined the following major components of interest rates: (i) the unit opportunity cost of the loaned money (ii) the administration charge on each unit loaned (iii) the unit premium for risk and (iv) any unit monopoly profit. The opportunity cost or what is called the pure rate of interest is determined by the moneylender's desire for making safer investments, such as government bonds and his liquidity preferences. The cost of administering loans for the moneylender depends on his ability to utilize his capacity to administer loans he makes, size of each one of his loans and the average length of time for which he makes loans (Chandravarkar: 1971). Premium for risk depends on the collateral and its marketability (Giri et al 1971). The monopoly profit arises from lenders' knowledge of borrowers, borrowers' knowledge of lenders and lenders' hold over borrowers. The rate of interest is determined by the intersection of the sloping demand curve of the monopolist moneylender and his schedule of costs for lending.

Gopal Karkal (1967), Chandavarkar (1971), and Giri and Sen (1971) also expressed similar views on the components of interest rates prevailing in underdeveloped areas.

Bhaduri (1977) developed a model of interest rate determination in backward agriculture incorporating three characteristics of the agrarian credit market; its isolation from the organized money market, the lender's monopoly power and its pre capitalist personalized nature .He showed that collaterals against which loans are obtained are typically undervalued. This makes default risky for the borrower than the lender and encourages the lender to charge high interests to force default for accumulating undervalued collaterals.

There were two interesting Indian studies relating to the measurement of the components of interest rates. With the help of All India Rural Credit Survey data, Pani (1966) fitted a regression function with the rural rate of interest as the dependent variable and liquidity in the rural economy and the availability of institutional finance as independent variable. He reported that the rate of interest declined by 0.8 to 1.3% for a 10% rise in the share of institutional credit and by 1.9 to 2% for a 10% increase in monetization.

Subrata Gatak (1977) estimated Spearman's rank correlation between interest rate and risk in lending (0.44) and interest rate and the strength of organized sector (-0.5). He used inter state data for the period from 1951-52 to 1963.

1.9 Methodology

This research is designed in such a way that it can interpret the credit situation and effectiveness of credit in the farming sector on the basis of descriptive as well as analytical research work. In this course primary data based on field survey and secondary data from different institutions were collected for study. While using the secondary sources, special attention was given for their reliability.

1.9.1 Universe of Study

For the whole study the universe of study is Nepal and for the field survey part it is Morang district, which lies in the Eastern Development Region of Nepal.

1.9.2 Sources of Data

For macro level study, this research work relied on secondary sources of data. The secondary sources were the census Reports of Agriculture conducted by Central Bureau of Statistics (CBS), (2001/02), Statistical Year Books published by CBS, Annual and Quarterly Reports of Nepal Rastra Bank, Nepal Bank Limited (NBL), Rastriya Baniya Bank(RBB), Agricultural Development Bank of Nepal, Economic

Surveys of Ministry of Finance (MOF), Reports of District Agriculture Office Morang, District Development Committee Morang and unpublished records maintained in the offices of concerned institutions.

1.9.3 Sampling Procedures

To study the demand for farm credit and productivity of farm credit a micro level study consisting of field survey was conducted. The survey design of the study was based on three stages so as to elicit adequate and accurate information by the field enquiry. The three stages of sampling were (i) selection of a district (ii) selection of the Village Development Committees and (iii) selection of sample households with borrowing.

For the present study Morang district was purposively selected on the basis of the fact that the researcher belongs to the district and this district is primarily the agricultural one. In the National Sample Census of Agriculture 1991/92, Morang reported the highest number of holdings (74646) and largest total area of all holdings (3225.3 hectares). So we selected Morang district for conducting the primary survey. Nine Village Development Committees (14 % of the total VDCs) were selected from a total of 65 Village Development Committees.

In the second stage, for the selection of the Village Development Committees, the VDCs were grouped into three groups based on the level of development. The level of development has been ascertained on the basis of certain selected indicators, namely availability of roads, irrigation and marketing facilities etc. Then from each group we have selected three VDCs at random. Thus, a stratified random sampling was adopted to select nine VDCs. Morang district was stratified into three categories viz, Low Developed Area (LDA), Moderately Developed Area (MDA) and Developed Area (DA). The selected sample VDCs are presented in the following table 1.1 below.

Table 1.1: Selected Village Development Committees

Category	Village Development Committees		
Low developed area	Rangeli	Jhurkia	Mahadeva
Moderately developed area	Tanki Sinwari	Katahari	Sunderpur
Developed area	Belbai	Bahuni	Dangihat

Source: Field Survey, 2001

In table 1.1 we see that the VDCs Rangeli, Jhurkia and Mahadeva were randomly selected from the LDA (Low Developed Area), Tanki Sinwari, Katahari and

Sundarpur were selected from MDA (Moderately Developed Area). Similarly, Belbari, Bahuni and Dangihat were selected from DA (Developed Area).

After selecting the VDCs, in the final stage, the households in each VDC were selected again on a random basis. For this, we listed the households with borrowing both from formal and non-formal agencies. These items of information were collected from the records of the formal credit institutions of the respective places and also by making local enquiries about borrowers from informal agencies. The borrowers were classified as marginal, small and medium and large farmers. Only the farmers who borrowed for short-term production purpose were included in the sample. The borrowers who borrowed for other purposes were excluded from the list. A total of 225 borrowing farmers (75 in each area) were selected randomly. The list was collected from the local moneylenders and the Agricultural Development Bank, Nepal Bank Limited and Rastriya Banijya Bank which were at the nearest distance from the sampled VDCs. The size wise distribution of sample farms is presented in the table 1.2.

Table 1.2: Size Wise Distribution of Sample Farms

S.N.	Group	Size of Farm (ha)	No. of Farms	% Share to Total
1	Marginal	Under 0.5	54	24
2	Small	0.5 – 2.0	126	56
3	Medium and Large	Above 2.0	45	20

Source: Field Survey, 2001

Sampled farms have been grouped as in table 1.1 and 1.2 for two reasons namely,

- i) The demand for farm credit and the productivity of credit are likely to vary between different size groups and between different areas as per level of development and
- ii) Land is the basic unit and the use of other factors including credit is positively correlated with it.

1.9.4 Method of Data Collection

Sample farms were visited personally and required data were collected by direct enquiry of the farmers with the help of a pre tested comprehensive questionnaire (Appendix). The study information elicited included land and other assets owned, crops grown, area under different crops grown, farm expenditure, income, investment

made, food and other consumption articles, amount borrowed, amount of credit utilized, prices of purchased inputs and questions on risk aversion.

1.8.5 Data Processing

After collecting the data, they were processed for relevant statistical calculations using simple calculator and also through the computer. The statistical tools used for analysing data are simple frequency counts, tabulation, simple averages, simple correlation, geometric means, percentages. For the projections of credit supply we have used the time series analysis. To study the factors determining the demand for farm credit we have used the multiple regression models and to study the productivity of credit we have used the Cobb-Douglas production function. To study the impact of credit on output, before and after credit, we have used paired t-test and z-test. To test the significance of estimated parameters we have used z-test, t-test, F-test, R^2 and Chi-square test.. The **SPSS** computer software programme was used to obtain the statistical measures used in this study.

1.9.6 Reference period

The reference period for production of crops and borrowing was two years, 2000/01 and 2001/02. The data were collected during the months- October 2001 to December 2001.

1.9.7 Limitations of the Study

The study is explanatory as well as analytical. Data collected through various channels are mainly of primary and secondary types. Inadequacy of official data from relevant sources has made it difficult to arrive at generalizations. Moreover, lack of initiative from the bank officials in many cases has made the scope of investigation limited.

While collecting VDC level data from farmers difficulties of varying nature were faced. Since the borrowers did not keep records, particularly of borrowings from informal sources, they recollected and furnished the information from memory. Hence, recall bias is an unavoidable limitation in this study. Widespread illiteracy and ignorance as well as apprehensive and evasive nature of the farmers have also created problems in getting precise information.

Despite these limitations, we have tried our best to collect latest data from official sources. In the case of field survey, the response of respondents was satisfactory and the recall bias was minimized by several cross checks made while interviewing them.

1.10 The Schematic Arrangement

Keeping in view the objectives of the study, the schematic arrangements, chapter wise, are as follows:

Chapter – I The present chapter is chapter- I where we have first made a statement of the problem then delineated the conceptual framework, objectives, importance, scope, hypotheses of the study and a brief overview of literature. The methodology and limitations of the study have also been dealt in this chapter.

Chapter – II gives general economic overview of Nepal along with its salient features. Agricultural development under different plans, growth performance of agriculture sector and current land reform measure are discussed in this chapter.

Chapter – III starts with the agricultural characteristics of the country examines based on the available data and examines agro-economic characteristics of the sampled area based on the survey data collected by us for the purpose of this research work.

Chapter – IV starts with the development of banking system in Nepal followed by operational and financial performance of the rural credit institutions based on secondary data available to us.. The need for expansion of rural credit institutions is also presented. The problems faced by rural credit institutions in delivering credit to borrowers and problems encountered by farmer borrowers in securing loan from the credit agencies are discussed on the basis of the primary data collected by us.

Chapter – V presents the sources, nature and supply of agricultural credit in Nepal. The existing supply of credit and projected supply of credit are presented on the basis of past trend. The demand for credit at the national level is analysed in detail. Factors affecting demand for farm credit at the farm level, the relationship between demand for farm credit and interest rate, and the relationship between price of inputs and credit demand are analysed. The risk aversion behaviour of farmers based on field survey is discussed in brief in this chapter.

Chapter – VI makes an attempt to analyse the productivity of credit through the use of Cobb–Douglas production function.. marginal productivity measures, marginal returns to opportunity cost ratios and percentage of credit utilization by farmer borrowers are calculated. The impacts of credit on production used by farmer borrowers and optimal utilization of credit by them are examined in this chapter.

Chapter – VII presents summary and conclusions on the basis of the analysis and also gives some suggestions for proper implementation of agricultural credit policies in the country especially in the study area.