AGRICULTURAL BORROWING BY RURAL HOUSEHOLDS: EVIDENCES FROM HILLS AND TERAI REGIONS OF NEPAL

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1. ABSTRACT OF THE STUDY

In the present study, a borrowing function has been estimated in order to identify the relevant factors affecting the borrowings of the farm families living under different topographical conditions. The major determinants of the agricultural borrowing are found to be capital expenditure, family expenditure and value of assets. The study, as discussed later, revealed that the total variation in the magnitude of borrowed amount due to unit change in capital expenditure and family expenditure is remarkably different between Khopasi (Hills) and Anandaban (Terai).

2. AGRICULTURE AND ACCESS TO AGRICULTURAL CREDIT IN NEPAL

Agricultural development forms the core of economic development in Nepal. Agriculture as the dominant sector of the economy provides employment to more than 90 percent of the total labour force, contributes about two-thirds to Gross Domestic Product (GDP) and accounts for 80 percent of the export earnings[1]. In 1977, 41 percent of rural households were living below the poverty line, the highest incidence being observed in the mountain areas (71.5 percent)[2]. In addition, with the present rate of population growth (i.e. 2.66 percent per annum), the modernization of the agricultural sector is regarded as a prerequisite to meet the growing demand for food-grains. However, scarcity of capital among farmers has been a major constraint in the adoption of modern technology and the development of the agricultural sector. Also, there has been an overall decline in agricultural productivity due to the increased cultivation of marginal lands particularly in the Hills and inadequate replenishment of soil nutrients through the application of manure and fertilizer, ultimately resulting in low soil fertility (Table 1).

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[1]World Bank,"Nepal: Development Performance and Prospects" (Country Study), p.12, (Dec. 1979).

[2]Asian Development Bank/HMG, Nepal, "Nepal:Agricultural Sector Strategy Study", Vol.II (1982).

Table 1. Average Yield of Major Crops

(In M. tons/hectare)

Crops	1961/62 to 1970/71	1971/72 to 1980/81
Paddy	1.92	1.88
Wheat	1.20	1.14
Maize	1.89	1.69

Source: Department of Food and Agricultural Marketing Services,
Handbook of Agricultural Statistics of Nepal, Nepal (1981).

Nepalese agriculture is characterized by a predominantly small farm structure where about 64 percent of total households own, on an average, less than one hectare of land[3], and the average holding of the marginal size farm is less than 0.5 hectare This not only makes it difficult to generate a marketable farm surplus but also forces farms to remain at subsistence level. The resultant low purchasing power limits the effective use of agricultural inputs especially by marginal farms unless institutional credit is provided to them.

Over the past decade, many low-income countries (LICs) have concentrated efforts aimed at channelizing a significant part of agricultural credit to the small farmers and, in addition, many of their programmes which aimed at facilitating credit flow to the small farmers have been strongly supported by international institutions, such as the World Bank and the Food and Agricultural Organization[5].

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[3]Nepal Rastra Bank, "Agricultural Credit Review Survey,1976/77",Kathmandu,Nepal(1980

[4]"Nepal: Agricultural Sector Strategy Study", op.cit., p.2.

[5]Adams, Dale W., "Small Farmers Credit Programs and Interest Rate Policies in Low Income Countries", Economics and Sociology Occasional Paper No.496, Agri-Finance Program, Department of Agricultural Economics & Rural Sociology: Ohio State University (1978).

In Nepal, the rural credit market still remains largely unorganized - that is,
the credit needs of a large portion of rural families are met by indigenous money-
lenders, landlords and agricultural traders. However, borrowing from the institu-
tional sources, such as the Agricultural Development Bank, the Sajhas (Co-operative
Societies) and the commercial banks is observed to have increased rapidly during
the past decade. According to the Agricultural Credit Review Survey conducted by
the Nepal Rastra Bank (1980), 24.02 percent of the borrowing farm families borrowed
from institutional sources in 1976/77 (see Table 2) as against 18.08 percent in
1969/70.

**Table 2. Proportion of Farm Families Reporting
Borrowing from Different Credit Agencies[a]**

(Percent)

Credit Agency	Total	Large	Medium	Small	Marginal
Institutional	24.02	8.08	5.07	7.86	3.01
Co-operatives & Sajha Institution	14.89	3.96	3.15	5.80	1.98
Ward/Village Committees	-	-	-	-	-
Agri. Development Bank	4.97	2.71	1.24	0.66	0.36
Commercial Banks	4.16	1.41	0.68	1.40	0.67
Private	75.98	10.80	11.60	26.15	27.43
Village Money-lenders	33.85	4.62	5.43	11.68	12.12
Professional Money-lenders	2.49	0.88	0.22	0.66	0.73
Landlords	3.73	0.80	0.66	1.32	0.95
Agricultural Traders	11.16	1.32	1.18	3.96	4.70
Friends & Relatives	24.29	3.08	4.11	8.43	8.67
Others	0.46	0.10	-	0.10	0.26
Total	100.00	18.18	16.67	34.01	30.44

a=Farm Families are divided into four categories on the basis of their land

holdings as follows:

	Large	Medium	Small	Marginal
Hills above	1.02 ha.	0.51-1.02 ha.	0.20-0.5 ha.	below 0.20 ha.
Terai above	5.42 ha.	2.71-5.42 ha.	1.02-2.70 ha.	below 1.02 ha.

Source: Nepal Rastra Bank, "Agricultural Credit Review Survey, 1976/77",
         Kathmandu, Nepal (1980).

In general, a substantial portion of the institutional agricultural credit has
gone to the medium and large farmers. Table 2 shows the proportion of farm familie
reporting borrowing from different credit agencies. It interestingly indicates tha
despite the government's efforts to institutionalize the agricultural credit systen
the non-institutional agricultural credit has continued to play a dominant role in
the Nepalese agricultural credit market. A higher proportion of credit from the
non-institutional sector is accounted for by the small farmers (Table 3). This
realization has led to the introduction of various programmes oriented towards smal
farm credit; such as the small farmers development programme, the priority sector
credit programe, and the total credit concept, etc. The common underlying
objective of these programmes is to enable small farmers to gain increased and
facilitated access to credit, and thereby assist them in improving their economic
status. However, a careful evaluation of such small farmer credit programmes
reveals the existence of certain serious problems. These include: loan defaults,
bottlenecks in institutional credit administration and dearth of voluntary private
savings. Between 1969/70 and 1976/77, the share of small-sized farm families in
total borrowings from the institutinal sector rose from 3 percent in 1969/70 to only
8 percent in 1976/77[6]. In constrast, out of total borrowings from non-institutiona
sector, the share of credit received by small-sized farm families rose from 19
percent to 33 percent over the same period[7].

Table 3. Proportion of Borrowings from the Institutional Credit Market

	1969/70	1976/77
Large	14.1	33.6
Medium	21.7	21.1
Small	64.2	45.3
Total	100.0	100.0

Source: Nepal Rastra Bank, "Agricultural Credit Review Survey" (1980)
[6]Agricultural Credit Review Survey (1980), op.cit., p.3
[7]Ibid.

3. DEMAND FOR AGRICULTURAL CREDIT

The question of demand for agricultural credit by the farmers also depends on their respective attitudes towards such borrowings. It is to be noted that the attitudes of large and small farmers towards borrowing activities are quite different from each other. Although the proportionate number of marginal farmers is higher than that of the large farmers, the amount of credit requirement per farmer is definitely higher for large farmers than small farmers. In addition,the large farmers seem to have relatively higher access to institutional credit than the small farmers. It is realized that access to agricultural credit is an important factor affecting productivity of farm resources. To improve access to agricultural credit by these both groups of farmers and also to improve agricultural productivity, some efforts should be made to identify the socio-economic factors which affect the agricultural credit borrowings by the farmers. Over the past decade most of the analytical discussions have concentrated more on the supply of agricultural credit than on the demand for agricultural credit[8]. The estimates of the demand for agricultural credit worked out by the agricultural financing institutions are based mostly on the annual programmes of these institutions prepared according to their loan capacity and physical facility[9]. There is a strong case for arguing that in Nepal the demand for agricultural credit is inelastic with respect to the interest rate because a major part of credit is spent on subsistence expenditure. This is, however, an empirical matter which is yet to be tested. Interest rate of the agricultural credit is, in general, recommended by the Nepal Rastra Bank (Central Bank) and it ranges between 15 to 18 percent depending upon the purpose of the loans and the type of the borrower. The large farmers who have sufficient collateral to pledge for agricultural loan are in a comfortable position to utilize the loan facility from the institutional credit sector. The small farmers with insufficient collateral,however,mostly seek loan from non-institutional sector irrespective of the prevalence of very high interest rate.

Thus, various economic and social factors other than the interest rate play an important role in determining the amount of agricultural borrowing. Factors such as farm size, farm expenditure, family expenditure, outstanding debt position,

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[8]Lipton Michael, "Agricultural Finance and Rural Credit in Poor Countries", World Development, Vol.4,No.7, pp.543-553 (1976).

[9]Agricultural Credit Review Survey (1980), op.cit., p.3.

family size, cost of borrowing, farm income, non-farm income, etc., determine the degree and amount of agricultural credit demanded. Moreover, the degree to which these factors affect the amount of borrowing might vary among different classes of farmers residing in different topographical conditions. This study has,therefor been undertaken to develop and test a borrowing function for farm credit and thereb provide additional insight into the factors affecting farmer's agricultural borrowi

4. THE CONCEPT OF CREDIT

The first general concern of the farmers is to meet their family requirements. Farme normally meet these family expenditures out of their past savings. Only after the family requirements have been met, the farmers look forward to meet the production expenditure (farm expenditure and/or capital expenditure).   Majority of the Nepale farmers are small farmers. Basically, they are subsistence farmers who employ domestically supplied rather than purchased inputs for most of the production. However, they do require to purchase some resources from the market. To acquire these resources,such as seed, chemical fertilizers,and tools and implements,they nee liquid asset like cash. And whenever cash is unavailable, i.e., their past savings fall short of requirements, they need credit.

Any transaction in which resources are provided and the payment deferred, whether the resource be labour, land, household needs or money, is credit[10]. Agricultural credit transactions can be divided roughly into three categories - (1) Credit in cash, (2) Credit in kind, and (3) Credit in cash and kind. A farmer needs credit whenever he lacks liquid assets required to purchase the commodities he desires.

Basically, three different situations for agricultural credit borrowing can be identified:

(a) Short term seasonal requirement for working capital,
(b) Short and/or long term loans demanded for consumption goods and social expenditures,
(c) Medium and long term financing needed for major farm improvements.

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[10]Thisyamondol P., Arromdee V., and Long, Millard F., "Agricultural Credit in Thailand: Theory, Data, Policy", Kasetsart University, Bangkok (1966).

4.1 Production and Non-productive Loan

It has been found that the farmers generally borrow two types of loan:
(a) Productive loan, and
(b) Non-productive loan

If the resources purchased with the borrowed money are used to increase income, the loan is productive. If the borrowed fund is used for social activities like wedding, festival, funeral, etc., the loan is non-productive. Productive loans are self-liquidating. That is, they enable the borrower to earn the additional funds needed to repay the loan. Non-productive loans produce no income and their repayment leaves the borrower in a poorer financial position. Therefore, if the farmer borrows heavily but spends the borrowed fund in family expenditure, his liquid asset position will decline further even if his crop harvest is unaffected. The farmer will have less funds to finance his own farm operation. In contrast, the borrowed funds used in production expenditure reproduce additional liquid assets to the farmer. Thus the purpose of expenditure is a very significant aspect in the borrowing behaviour of the farmer.

4.2 Conceptual Role of Credit in Farm Production

The theoretical framework for most credit impact studies assumes a neoclassical production function, which is continuous and twice differentiable.

$$Q = f(x_1, x_2, \ldots \ldots \ldots \ldots, x_k/x_{k+1}, \ldots \ldots \ldots \ldots x_n)$$

Where,

Q = quantity of output

x_i = variable input i for i = 1, 2, ... k

x_i = fixed input i for i = k+1, k+2, ... n

A credit project, which provides loans at an effective cost of borrowing, is expected to increase optimum input use and the corresponding level of output. The magnitude of these increases depends on the difference between the marginal time preference for present over future consumption and the concessionary cost of borrowing. The higher the difference, the higher the increase in the optimal use of inputs, in output and in net farm income, given, of course, that the product and input markets are accordingly competitive. The profit maximising farmer would then want to employ credit up to the point where the marginal value product of capital equals the cost of capital.

This situation will not be true if credit rationing exists in the market. Credit rationing may be internal and/or external. Internal rationing is self-imposed by the farmer due to the existence of risk and uncertainty resulting from the possibility of loss. As a result, the farmer would want to discount marginal value product of credit on the basis of his subjective judgement. External rationi on the other hand, is imposed by the lending insitution. It can be imposed in two ways:

(a) Price mechanism: The lending institution increases the interest rate charge to the farmer when it views lending additional credit more risky.

(b) Non-price mechanism: The lending institution can set a definite limit to the amount of loan to be granted. Due to the limit imposed, the farmer would be able to borrow only lesser amount, thereby preventing him from obtaining an optimal allocation of his resources.

4.3 Agricultural Credit and Outstanding Debt

When the farmer's annual income is not sufficient to cover his farm and family expenditures, he has to borrow in order to cover the deficiency of liquid assets. Since farm income is irregular, the insufficient income to cover the expenses will lead to an accumulation of outstanding debts. The magnitude of outstanding debt may differ significantly between different strata of farmers rather than within the same strata of farmers. As the volume of outstanding debt increases, a major portion of the farmers' income will go towards the repayment of those debts. The dearth of cash to meet the production expenses will result in increased demand for agricultural credit.

4.4 Agricultural Credit and Asset Size

The creditworthiness of a farmer is indicated by the size of his asset holding In other words, asset size can be looked upon as the measure of farmer's ability to repay the loan. Therefore, a borrower's asset affects the size of the loan that will be granted to him because lenders ration loans according to borrower's ability to repay. The size of total assets also affects the type of credit arrangement and the type of contract adopted as it affects the level of default risk perceived by the lenders and it determines the availability of collateral. The value of assets, in turn, affects the level of interest rates charged. This is so because it has its effects on loan size and the type of contract adopted.

5. A FRAMEWORK FOR DEMAND VERSUS BORROWING FUNCTION

The notion that demand equals supply at equilibrium point is rather ambiguous when viewed in the background of agricultural credit market. As explained earlier, agricultural credit markets are characterized by credit rationing. In the presence of credit rationing, there is incomplete price adjustment due to the stickiness of loan rates and it results in disequilibrium in the agricultural credit market[11]. The general problem in the absence of an equilibrium condition is that the ex ante demand and supply quantities cannot, in general, be equated to the observed quantities traded in the market. It implies that farmers may not be able to borrow even if they want or the amount obtained may be lower than demanded. If so, the observed amount of loan borrowed by a farmer in the credit market does not indicate his actual demand for credit.

There is an empirical difficulty in measuring the demand for credit[12] and, there-fore, in specifying a demand function. What we can estimate from the observed data, however, is a borrowing function that is, the determinants of the amount of credit borrowed as opposed to that demanded.

5.1 The Empirical Model

The determinants of the amount of credit borrowed include both demand and supply variables. Based on the conceptual framework explained, the following linear model of agricultural loan borrowing is specified:

$$BLI = \beta_0 + \beta_1 C_E + \beta_2 F_E + \beta_3 O_D + \beta_4 V_A + \varepsilon_i$$

Where, BLI = amount of agricultural loan borrowed

C_E = capital expenditure

F_E = family expenditure

O_D = outstanding debts

V_A = value of assets

[11]Stiglitz Joseph E. and Weiss A.,"Credit Rationing in Markets with Imperfect Information", American Economic Review, Vol.71, No.3, pp.393-410(1981).

[12]Scaley, Jr.,C. W., "Credit Rationing in the Commercial Loan Market: Estimates of a Structural Model Under Conditions of Disequilibrium", Journal of Finance, Vol.34, No.2, pp-689-702 (1979).

ε_i = disturbance term which is assumed to be normally distributed with zero mean and constant variance.

β_i's= parameters

The rationale for including the first three independent variables is to take into account the operational size of the farmers and their financial position during a reference year. The fifth variable-value of assets - is included to consider ability of the farmers to service debt.

5.1.1   Specification of the Variables

Dependent Variable

Amount of agricultural loan borrowed (BLI):

Amount of agricultural loan borrowed is defined as the total borrowings of a farm household during the reference year.

Independent Variables

(i) Capital Expenditure (C_E):

Capital expenditure is defined as the amount of rupees (Rs.) spent on the purchase of land, livestock, machinery, tools, transport equipment and investment in poultry, construction of farm houses, cattle shed, reclamation of land, development of new irrigation facilities, and so on.

(2) Family Expenditure (F_E):

Family expenditure is defined as the amount of Rs. spent on the consumptior food, drinks, clothing, social, religious expenditures, and others, such as expenses for donations, land taxes, house taxes, etc.

(3) Outstanding Debts (O_D):

The position of outstanding debt of a farm family is measured as the total amount of loan that the farmer is indebted to at the beginning of the reference year.

(4) Value of Assets (V_A):

Value of assets comprises the value of land and buildings, livestock, tools and machineries, transport equipment, household utensils, and gold & silver possessed at estimated current price during the reference year.

5.1.2 Hypothesis Setting

(1) The amount of agricultural borrowing is positively related with capital expenditure.

To finance any investment, farmers can use either their own saving or borrow money . Given that other things remain constant, when capital expenditure increases, the demand for agricutlural borrowing increases.

(2) The amount of agricultural borrowing is positively related with family expenditure.

As the use of available fund increases the family expenditure, there will be shortage of liquid assets. The farmer will have deficit fund to finance his own farm operation. It will, therefore, enhance the requirement of agricutlural borrowing.

(3) The relationship of amount of agricultural borrowing with the outstanding debts is ambiguous.

Larger the volume of outstanding debts, the more the farmer's income utilized to repay those debts. The deficiency of cash to meet the current farm expenses/investments will then require higher amount of agricultural borrowing. However, lenders will be reluctant to advance loans to those borrowers whose volume of outstanding debts appear large. Hence, the relationship is ambiguous in nature.

(4) The relationship between amount of agricultural borrowing and the value of assets is uncertain.

Higher the value of assets, wider becomes the collateral base resulting in higher creditworthiness. Therefore, lenders will be willing to advance more amount of loan to such borrowers. However, farmers with higher value of assets may not require to borrow higher amount of agricutlural loan. Hence the relationship is also ambiguous in nature.

5.2 Some Characteristics of the Model

A problem common to many studies is that they tend to define the demand for credit as the amount of agricultural credit borrowed by the farmers at a given interest rate. However, the borrowing function utilized here distinguishes actual agricultural credit borrowed by the farmer from his actual demand for agricultural credit. Given that the market interest rate is determined by supply side and demand side factors, there emerges an important problem of identification here. Accordingly, this study omits the interest rate as an independent variable in the estimation of borrowing function.

Secondly, it is likely that there is high multi-collinearity between expenditur and income variables in the borrowing function. In order to avoid this problem, it is felt that there is an advantage of choosing expenditure variable over income variable for estimation. The basic rationale in doing so is that it is always troublesome in finding out the best measuring proxy for an income variable. The past studies which included the measure of transitory income variable gave different results (Long 1968, Iqbal 1983). It is so because the processes adopted in the measurement of transitory income by these researchers were different. Long (1968) measured the transitory income as the ratio of gross output to the value of land and it turned out to be statistically insignificant. Iqbal (1983) measured transitor income as the difference between current income and permanent income and the result turned out to be negatively and significantly related to the demand for funds. For our borrowing equation, we have chosen capital expenditure and family expenditure instead of income simply because measuring the current income is difficult without sufficient information.

Thirdly, two separate regressions- one for Hills and the other for the Terai- have been tested to identify the relative influences of the independent variables on agricultural borrowing. The separate regressions are run on the assumption that borrowing behaviour of farmers from different topographical regions may vary. However, to test this possibility, a Chow's Test[13] is carried out to test the

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[13]Chow's Test is as follows:

If the parameters for the Hills model is B_i, and that for Terai model is r_i, then null hypothesis is $H_0 : B_i \ \gamma_i$. The appropriate F-statistic to test null hypothesis is given by

equality of the impact of the independent variables on amount of borrowing in the two regions, i.e., Hills and Terai.

Fourthly, agricultural credits are prone to the problem of fungibility since it is difficult to distinguish as to how a farmer utilized the farm loan for consumption expenditure. Accordingly, the concept of agricultural credit used in this study has covered the loans borrowed other than for production purposes, such as the consumption loans during the year.

5.3 Data Used in the Study

The data used in the study are cross-sectional primary data obtained from a field survey conducted in the Rupandehi and Kavre districts of Nepal. The stratified random sampling technique was adopted for data collection since it is regarded both efficient as well as convenient to administer than the simple random technique. The sampling technique was therefore designed in a way to choose one village panchayat (the lowest administrative and political unit) from each sample district. The major factors considered in the selection of village panchayats were:(a) the existence of a mixed population of small & large farmers; (b) the existence of institutional credit markets; and (c) the presence of farm households borrowing from different sources of agricultural credit markets. Using the above criteria, village panchayats (Anandaban and Khopasi) were selected from Rupandehi and Kavre districts,respectively. Of the farm households selected randomly from these village panchayats, the farm size up to 0.51 ha. in the Hills or up to 2.71 ha. in Terai was considered as small one whereas above 0.51 ha. in the Hills or above 2.71 ha. in Terai was considered as large. The reference period for the study is June 15, 1984 to June 14, 1985.

Contd...

$$F_{K,\ N + M - 2K} = \frac{(ESS_R - ESS_{UR})/K}{ESS_{UR}/\ (N + M - 2K)}$$

Where, N = no. of observations of restricted equation
M = no. of observations of unrestricted equation
K = no. of independent variables
ESS_R = restricted residual sum of squares of individual equation
ESS_{UR} = unrestricted residual sum of squares which is equivalent to sum of residual sum of squares of the individual equations.

If the F-statistic is larger than the critical value of the F-distribution with K and N+M-2K degrees of freedom, we can reject the null hypothesis.

5.4 Discussion on Empirical Results

The estimating technique used was the Ordinary Least Squares. The result of Chow's Test (Table 4) shows F-statistic (4.09) significant at 5 percent leve of probability implying that there is significant difference in variation of the amount of borrowing explained by explanatory variables for Terai and Hills.

The estimation results are presented in Table 5. The coefficient of multip determination (R^2) for the equation representing farm samples in Anandaban (Terai) is found to be 0.9717 which implies that 97.17 percent variation in amount of borrowing can be explained by all the independent variables. The t-statistics show significance of capital expenditure at 1 percent probability level while it shows significance of family expenditure at 5 percent probability level. The other two variables, namely, outstanding debt and value of assets, are found to be statistically insiginificant. The signs of all the variables are as expected. Calculated F-statistic in our result is found to be 386.6165 which is highly significant implying that all the explanatory variables help significantly toward explaining the variation in amount of borrowing.

Table 4. CHOW TEST [a]

a) Regression for Anandaban (Terai), Sample Size = 50

$$BLI = -2974.48 + 0.92\ C_E + 0.50\ F_E + 0.03\ O_D + 0.0003\ V_A$$
$$(-1.14)\quad (30.39)\quad (2.32)\quad (1.24)\quad (0.05)$$

$$R^2 = 0.97 \qquad ESS_1 = 3.31 \times 10^9$$

b) Regression for Khopasi (Hills), Sample Size = 50

$$BLI = -4344.89 + 0.60\ C_E + 1.11\ F_E + 0.20\ O_D - 0.009\ V_A$$
$$(-3.27)\quad (5.79)\quad (7.74)\quad (1.27)\quad (-1.92)$$

$$R^2 = 0.84 \qquad ESS_2 = 1.18 \times 10^9$$

c) Regression for Pooled (Restricted), Sample Size = 100

$$BLI = -5599.47 + 0.88\ C_E + 1.00\ F_E + 0.03\ O_D - 0.004\ V_A$$
$$(-4.33)\quad (38.43)\quad (8.97)\quad (1.23)\quad (-1.12)$$

$$R^2 = 0.95 \qquad ESS_R = 5.29 \times 10^9$$

d) $F\text{-statistic}_{4,92} = 4.09$ **

a= Figures in the parentheses are t-statistics
** Significant at 5% probability level.

The positive and significant coefficient of capital expenditure implies that the farmers with high capital expenditure require higher amount of credit.

The positive and significant coefficient of family expenditure confirms our theoretical expectation that, as there is an increase in family expenditure, the deficit in liquid assets induces a higher amount of borrowing.

The positive and statistically insignificant coefficient of outstanding debts implies that the observation obtained in our sample can not establish a meaningful impact of this variable on the amount of borrowing. This is also true in the case of the value of asset variable.

In Khopasi (Hills), the R^2 indicates that the independent variables can explain the variation in amount of borrowing by 84.77 percent. The 't' statistics for capital expenditure and family expenditure are significant at 1 percent probability level while for value of assets at 10 percent probability level. Only the coefficient of outstanding debts is statistically insignificant.

The significance and expected sign of the coefficients of capital expenditure and family expenditure may be attributed to the same theoretical reasons as explained in case of Anandaban. Also the positive and statistically insignificant coefficient of outstanding debts may be explained by the same reasons as in Anandaban.

The significant and negative sign of the coefficient of value of assets implies that farmers with higher value of assets borrow less. This is true only if the farmers with higher value of assets are rich farmers.

Although half of the independent variables show significant relationship with the amount of borrowing both in Anandaban (Tereai) and Khopasi (Hills), the differences in the coefficients of some of these variables between Anandaban and Khopasi is notable. For example, the coefficient of capital expenditure in Anandaban is almost 0.5 times greater than that in Khopasi. That is, one unit increase in capital expenditure brings about 0.60 unit increase in amount of borrowing in Khopasi while the same brings about 0.90 unit increase in amount of borrowing in Anandaban. The relatively low coefficient of capital expenditure in Khopasi may be attributed to the fact that the effective cost of borrowing in Khopasi may be higher Also, it is mentioned elsewhere that the proportion of farm families borrowing from non-institutional sector is relatively high in Khopasi and, therefore, most of the borrowers have to pay high nominal interest rate on loan. All these evidences thus reflect the higher cost of borrowing in Khopasi (Hills).

Also, it is found that the coefficient of family expenditure in Khopasi is almost 2 times greater than the one found in the case of Anandaban. It means or unit increase in family expenditure induces 1.11 unit increase in amount of borr in Khopasi while it induces 0.50 unit increase in amount of borrowing in Anandal This greater impact may be explained by the fact that these households are relat poorer than the Terai households and hence a larger proportion of income is spen on food and housing in Khopasi. However, the magnitude of the family expenditur coefficient of Khopasi suggests that one unit increase in family expenditure ind more than one unit (1.11) increase in borrowing. This seems to be impossible wh may be attributed to the fungibility of credit. Credit use for production and/o consumption purposes could not be easily distinguished. If the coefficients of both capital and family expenditure are aggregated, an average of 0.71 and 0.86 units borrowing will be made in response to a unit increase in total expenditure in Anandab; and Khopasi, respectively. The difference between these averages may be the res of the fact that households in Khopasi are poorer relative to those in Anandaban. Thus, when expenditures increase, Khopasi farmers depend more on borrowed money than do the Anandaban farmers.

Table 5. Regression Results of Agricultural Borrowing in the Terai and Hills[a]

Dependent Variable : BLI = Amount of Loan Borrowed

Independent Variables		Anandaban (Terai)	Khopasi (Hills)
Intercept	C	-2974.4875 (-1.1494)	-4344.8947 (-3.2756)
Capital Expenditure	C_E	0.9252 (30.3911)***	0.6080 (5.7954)***
Family Expenditure	F_E	0.5090 (2.3218)**	1.1170 (7.7439)***
Outstanding Debt	O_D	0.0355 (1.2456)	0.2056 (1.2717)
Value of Assets	V_A	0.0003 (0.0571)	-0.0098 (-1.9285)
R^2		0.9717	0.8477
F - statistic		386.6165	62.6318
Sample Size		50	50

a= Figures in the parentheses are t-statistics
*** and ** indicate significant at 1% and 5% probability levels, respectively.

6. SUMMARY AND CONCLUSION

A glance over the agricultural credit situation in Nepal showed that only 24.02 percent borrowing farm families borrowed from the institutional sources in 1976/77. Also, there is evidence that the largest percentage of the farm loans still continues to go for consumption purposes (42.40 percent). And almost all of the consumption loans are still provided by the non-institutional sources. It indicates that, if the above trend continues, the efforts made towards increasing agricultural productivity through the provision of institutional credit will go in vain. If adequate amount of credit could be met through the institutional sector, this could go a long way in diminishing the existing influence of non-institutional source. It is, therefore, important for policy matters to review the weights given to the factors which are considered to have had strong bearing on the borrowing behaviours of the farmers.

In our study, borrowing functions were estimated on a set of variables based on the theoretical consideration of how amount of borrowing would be affected by borrower's and lender's decision variables. The major findings of this study are related to the following special features appropriately considered while formulating the model to be estimated: (i) Differentiating demand function from the borrowing function, (ii) an attempt being made to avoid high multi-collinearity effect by separating income variable from expenditure variable, (iii) Differentiating borrowing function for Terai & Hills region separately, and (iv) consideration of the fungibility concept of the agricultural credit.

Our study suggests that important determinants of agricultural borrowing are capital expenditure, family expenditure and value of assets. The empirical results highlight that there is a significant difference between the borrowing behaviour of the farmers in Anandaban and Khopasi. For example, it was found that the magnitude of variation in the borrowed amount due to unit increase in capital expenditure in Anandaban is almost 0.5 times greater than that in Khopasi. On the contrary, the magnitude of variation in the amount of borrowing due to unit change in family expenditure in Khopasi is found to be 2 times greater than that in Anandaban.

The insignificant and positive coefficient of outstanding debt in both the panchayats leads us to conclude that this variable does not play any significant role in the amount of borrowing for both the regions. Possibly, the lesser number of observations showing outstanding debt might be the reason for its statistically insignificant role on the borrowing behaviour. However, the positive sign of the coefficient of outstanding debts indicates that demand side seems to be overpowering the supply side of credit. Nevertheless, the insignificant result does not allow us to confirm our statement. It may be possible that the

farmers with high outstanding debts do visit the lenders for borrowing, but becaus of the limit imposed on amount of borrowing by institutional sector and also owing to the reluctance on the part of non-institutional sources to provide sufficient amount of loan, farmers with high outstanding debts are able to get only a little amount of credit.

The insignificant coefficient of the asset variable for Anandaban shows that this variable does not have any effect on amount of borrowing because the amount of agricultural loan advanced by both institutional and non-institutional lenders is very small as compared to the value of assets of borrowers. As it is the case that land is the main component of asset holding, the higher usefulness of land (bec. of its high productivity and other uses)makes the value of assets remarkably high in Terai areas. Surprisingly, the significant and negative sign of the coefficient of asset in Khopasi implies that farmers with higher value of asset borrow less amount of loan in Khopasi. This is so despite the fact that lenders will be willin to lend higher amount of loan to borrowers with higher value of assets. However, our result shows that farmers with higher value of assets have not borrowed higher amount of loan. This situation may be explained by the fact that, in Khopasi, either there is lack of enough incentives to motivate the rich farmers to invest in large agricultural projects or simply these farmers are not interested at all in large agricultural investments. Most probably, poor market of the agricultural produce or the non-existence of agro-based industries in the region are some of the likely explanations for this kind of situation.

The empirical results also highlight that there is significant difference between the borrowing behaviours of farmers in Anandaban and Khopasi. The relative higher impact on the borrowing due to increase in total expenditure in Khopasi indicates that the farmers in Khopasi (Hills) are poorer than the farmers in Anandaban (Terai). This suggests that the institutional lenders should be directed to advance higher proportion of agricultural loan and the concerned agencies should make efforts to provide adequate infrastructure including marketing management units in order to increase the income and standard of living of poor farmers in the Hills.

7. POLICY IMPLICATION

Some policy implications can be drawn from the results we obtained in our study.

1. As there is an indication that agricultural loans are utilized for consumption purposes also, it is reasonable for the credit institutions to start thinking about incorporating the consumption loan along with the production loan. Or, as in ongoing total credit programme, the institutional lenders could be advised to advance loan for the whole year's production programme of the farmers. The fungibility tendency of agricultural credit is more prominent in Hills (Khopasi). Therefore, the proportion of the loan requirement for subsistence expenditure which is, in general, intuitively included in farm loan by institutional lenders has to be kept relatively higher in Hill areas so that chances of misutilization of production loan could be greatly reduced.

2. There are various reasons responsible for the existence of highly indebted farmers. One of the basic reasons for the prevalence of highly indebted farmers in Nepal is the failure of their agricultural projects as a result of natural calamities/causes. Such indebted farmers would face adverse situations if the institutional lenders impose limit on the amount of their borrowings. This is so because such a practice will further consolidate the farmers' traditional habit of borrowing from the non-institutional lenders. Since these lenders do not provide sufficient amount of loan to such borrowers, the credit received will not suffice to run their projects which are already in a poor state. As a result, the economic conditions of indebted farmers will deteriorate further. It is, therefore, suggested that the practice of imposing limit on agricultural loan to indebted borrowers should be reviewed if they are deemed to be skilled and experienced entrepreneurs.

3. It is seen that increase in capital expenditure induces increase in agricultural borrowing both in Anandaban and Khopasi. The results also reveal that there is more scope for capital expenditure in Terai than in Hills. A policy of advancing higher share of agricultural loan in capital expenditure specially in the Terai is more desirable because of its eventual positive impact on production and income.

4. As the farmers with higher value of assets in Khopasi (Hills) do not seem to have invested in large agricultural projects, it is necessary to launch appropriate programmes for building up necessary infrastructure so as to promote agro-based industries. The launching of integrated development programme followed side by side by lead bank scheme might be an appropriate solution to the type of problem encountered by the Khopasi farmers. The provision of such an arrangement would encourage the farmers to fully utilize their creditworthiness by borrowing loan for large investment in agricultural sector.

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