The present chapter is divided into two sections:

Section One aims at :

Studying the impact of credit on the labour use, income from the asset financed and consumption pattern of beneficiary households.

Section Two aims at :

Examining the relationship of labour and working expences with output based on production function analysis.

6.1   Section I

Economists primarily assume that a household acts rationally and tries to allocate its scarce resources efficiently in order to maximize 'utility' (Cloud, 1989). Rural credit is disbursed under the programme with the expectation of generating employment and income for the beneficiary households (BHs). The concept is to provide an opportunity for the rural households to utilize its surplus labour and subsequently maximize benefits for the family's welfare.

This chapter intends to examine the effect of programme intervention on the various categories of BHs and one and two loan cases.

The impact of credit is measured by computing the following indicators:

- Aggregate and average employment from the asset financed [Employment Input]

- Aggregate and average income from the asset financed [Income Impact]

- Increased consumption for the beneficiary households [Consumption Pattern]

6.1.1 EMPLOYMENT IMPACT

Impact of credit on employment generation is measured in terms of labour hours generated per annum for:

1. Sample BHs [Benificiary Households]
2. FBHs [Female Benificiary Households]
3. MBHs [Male Benificiary Households]
4. FHHs [Female Headed Households]

In each category of beneficiaries we have worked out seperate labour hours for one and two loan cases.

Table 6.1 depicts the aggregate incremental employment in terms of labour hours from the asset financed. The Table 6.1 indicates that FBHs accounted for around 75 per cent of beneficiaries and loan disbursed. Whereas the share of MBHs was around 25 per cent. FHHs accounted for nearly 6 per cent of beneficiaries and loans. These shares are in tune with the sample distribution pattern, except that the FHHs shares are smaller.

74

Table 6.1

Distribution of Beneficiary Households: Aggregate   Employment from   Asset Financed

BHs	I Loan			II Loan			I & II Loan		
	No.of Beni.	Lab Hrs p.a.	%	No.of Beni.	Lab Hrs p.a.	%	No.of Beni.	Lab Hrs p.a.	%
FBHs	44 (63.7)	48928 (59)	43	46 (90.1)	64124 (89)	57	90 (75)	113052 (73)	100
MBHs	25 (36.2)	34050 (41)	82	5 (9.8)	7680 (11)	18	30 (25)	41730 (27)	100
FHHs	7 (10.1)	6601 (7.9)	69	2 (3.9)	3000 (4.2)	31	9 (7.5)	9601 (6.2)	100
Total	69 (100)	82978 (100)	54	51 (100)	71804 (100)	846	120 (100)	154782 (100)	100

(Figures   in parentheses are percentages to the totals of   respective columns).

Note : No. of Beni. refers to no. of beneficiaries.
       Lab Hrs p.a. refers to labour hours per annum.

Table 6.1 illustrates employment generation patterns category wise (FBHs,MBHs,FHHs) and loanwise (I loan, II loan). For the sample as a whole, employment generated worked out to 154782 labour hours, out of which, 73 per cent was generated by the FBHs and 27 per cent by the MBHs. The FHHs accounted for 6.2 per cent of labour hours generated.

The   BHs with two loans generated employment of 71804 lab.hrs p.a. in which the FBHs' contribution was 89 per   cent and MBHs' 11 per cent. The shares of FHHs in   one   and   two loan cases was 3.9 and 4.2 per cent respectively.

BHs with one loan generated employment of 82978 lab. hrs., out of which, 59 per cent was contributed by the FBHs and 41 per cent by the MBHs.

Out of the total employment generated by FBHs, benificiaries with one loan generated 43 per cent and that with two loans generated 57 per cent. One and two loaned MBHs were contributing 82 and 18 per cent of the total employment generated by the MBHs, respectively. FHHs' employment generation pattern indicated that 68.7 per cent of the labour hours were generated by one loan and 31.2 per cent by two loans.

Given the sample gender distribution, the aggregate employment generation does not reveal any gender differential. Hence, for capturing the differences between the gender categories of the BHs, we have computed the averages of labour generated per household by deviding the total labour hours by number of benificiaries in the each catagory of sample from Table 6.1. The relevant data is presented in Table 6.2.

On an average, the employment generated for the sample BHs worked out to 1289 lab hours and for FBHs 1256 lab hrs; a little below the sample average (2.56 per cent). For the MBHs, it was 1391 lab hrs, which was above the sample average by 7.91 per cent and for the FHHs it was 1067 lab. hrs. p.a. which was lower than the sample average by 17.2 per cent.

A look at the labour hours generated by BHs with two loans revealed that, BHs with two loans created incremental employment of 1408 lab hrs, from the asset financed. For the FBHs it was 1394 lab hrs; 9.23 per cent lower than the sample average. For the FHHs, it was 1500 lab. hrs., surprisingly 6.5 per cent higher than the sample average and for the MBHs it was 1536 lab hrs which was 9.1 per cent higher than the sample average.

In conclusion, a study of the employment generation from the asset financed indicated a positive change in employment for all the catagories of BHs. Among the various categories, employment generation was consistently higher for MBHs than FBHs.

Further, amongst the one and two loan categories, the benificiary households with two loans were efficiently utilising the labour than BHs with one loan.

6.1.2   INCOME IMPACT

Having examined the employment generated from the use of credit, we now analyse the income impact. Income is a very comprehensive indicator as it blends both the technical and price effects of credit through production.

The following table depicts aggregate income of the BHs categorywise and loan wise.

Table 6.3

Distribution of Beneficiary Households: Aggregate Income from Asset Financed

BHs	I Loan			II Loan			I & II Loan		
	No.of Ben.	Rs. p.a.	%	No.of Ben.	Rs. p.a.	%	No.of Ben.	Rs. p.a.	%
FBHs	44 (63.7)	90288 (60.5)	37.1	46 (90.1)	152444 (87.26)	62.7	90 (75)	242730 (74.95)	100
MBHs	25 (36.2)	58875 (39.5)	72.6	5 (9.8)	22250 (12.8)	27.4	30 (25)	81120 (25.05)	100
FHHs	7 (10.1)	13132 (11.3)	66.9	2 (3.9)	6500 (3.7)	33.1	9 (7.5)	19632 (5.97)	100
Total	69 (100)	149143 (100)	46.0	51 (100)	174694 (100)	53.9	120 (100)	323850 (100)	100

(Figures in parentheses are percentages to the totals of respective columns.)

Note : No. of Ben. refers to number of beneficiaries
       Rs. p.a. refers to Rupees per annum.

The above table shows that FBHs' distribution amongst first and second loan was almost equal. Incremental income derived at the aggregate level had been Rs. 323857 for the whole sample and for each category it was found to be Rs. 242732, Rs. 19632 and 81125 for the FBHs, FHHs and MBHs respectively. Amongst the FBHs , 37.1 per cent of the aggregate incremental income was generated by one loan and 62.7 per cent of the aggregate incremental income was generated by the FBHs with two loans. The FHHs with one and two loans were contributing 66.9 and 33.1 per cent of the aggre-

gate incremental income generated by them. While the MBHs with one and two loans were contributing 72.6 and 27.4 per cent of the aggregate incremental income generated by them.

After analysing the aggregate income generated by the beneficiary households categorywise, it becomes imperative to examine the extent to which the BHs have maximised the benefits individually. Table 6.4 not only fulfills the above objective, but also provides a segregated picture of the incremental income categorywise which facilitates gender comparisions.

Table 6. 4 portrays the incomes derived by the BHs on an average per annum in the post loan period (1987-88 to 1990-91), category and loanwise.

Table 6.4

Distribution of Beneficiary Households: Average Income from Asset Financed (per annum)

Beneficiary Households	Average Income From Asset Financed in Rs.		
	I Loan	II Loan	I & II Loan
FBHs	2052 (-5.0)	3314 (-3.2)	2697 (-0.03)
MBHs	2355 (8.97)	4450 (29.9)	2704 (0.22)
FHHs	1876 (-13.18)	3250 (-5.1)	2181 (-19.16)
Total	2161	3425	2698

(Figures in parentheses are percentage variance from the loan category average)

80

The table clearly indicates a positive increase in income of the household. The average incremental income of BHs was Rs 2698. For the FBHs and FHHs it was Rs. 2697 and Rs.2181 respectively, short of the sample average by 0.03 and 19 per cent respectively. The highest incremental income per household was reported by the MBHs (Rs 2704) which was higher than the samples average by 0.2 per cent.

Amongst the BHs with one loan, income generation by the MBHs was Rs 2355, higher than the average incremental income generated by the other categories of BHs and also by the sample households (Rs.2161). The average incremental income of FBHs was Rs. 2052 which was lower than the sample average by 5 per cent. The average incremental income generated by the FHHs was lowest amongst all the category of BHs and in comparison to the average incremental income of the sample households also, it fell short by 13 per cent.

For BHs with two loans, maximum incremental income was generated by the MBHs (Rs. 4450) higher than the sample average incremental income of Rs. 3425 by 23 per cent. The FBHs average incremental income was Rs. 3314; a little below the sample average by 3.2 per cent. FHHs average incremental income worked out to Rs 3250, 5.1 per cent lower than the sample's incremental average income. However, this difference between average incremental income of the whole sample and FHHs was lesser than the difference between sample's average incremental income and FHHs' average incremental

income with one loan, which meant that the FHHs with two loans were able to make better use of the credit disbursed.

The lower average incremental incomes of the FBHs and more so of the FHHs can be attributed to the poor quality of asset acquired by the FHs, smaller family size, singular capacity of the FHHs coupled with illiteracy, lack of access to modern technology and exposure to outer domain.

In conclusion, the income generation pattern indicated a rise in the income from the asset financed for all the categories of BHs. The increase was more pronounced for the MBHs. Further, the income generation was also higher for the two loan beneficiary households.

6.1.3   CONSUMPTION PATTERN

Incremental incomes lead to a change in the living conditions of the BHs and changes in the consumption pattern, rightly reflect the extent of emancipation in real terms. A detailed study of the consumption pattern requires specialized surveys to measure the exact food consumption and nutritional status of a family and other consumption items, which is beyond the scope of this study.

However, an effort was made to compute the changes brought about in the consumption pattern by the incremental income, by studying the changes in consumption items ranging from milk, cereals, vegetables, clothing and housing.

82

Changes in consumption of basic necessities by the family does not merely depend on the incremental income, but also on who earns it and who controls the income and decides to spend it. (Rusdan Rehman, Grameen Bank, 1986). Research studies in India (Kumar, 1977), point out the greater importance of mothers' income in determining the nutritional value of the household and children. Improvements of men's income does not linearly benefit and lead to family's welfare, since men's and women's income are used differently with regard to food for the family and loss of women's income accentuates their dependent status with potentially serious demographic consequences (Safilios and Rothchild, 1985).

Intricacies of the income earning behavior of BHs by gender showed women as the major contributors, decison makers and controllers of the incremental income. (Refer Chapter Eight). In view of the above findings and available literature, changes in the consumption pattern can be attributed as a part of women's endeavour in all the categories of BHs.

Table 6.5 depicts the changes in the consumption pattern of BHs. It was found that none of the households had experienced any decrease in the intake of commodities. They either felt that there was no difference in their consumption pattern or they were better off with the additional income.

Table 6.5

Beneficiary Households : Consumption

BHs	Consumption of :					
	Milk		Cereals		Vegetables	
	Incrs.	No Diff.	Incrs.	No Diff.	Incrs.	No Diff.
FBHs	90 (100)	–	15 (16.7)	75 (83.3)	5 (5.6)	85 (94.4)
MBHs	30 (100)	–	6 (20)	24 (80)	4 (13.3)	26 (86.7)
FHHs	9 (100)	–	2 (22.2)	7 (77.7)	–	9 (100)
Total (FBH+MBH)	120 (100)	–	21 (17.5)	99 (82.5)	9 (7.5)	111 (92.5)

(Figures in parentheses are percentages to the totals of respective categories.)

Note :   Incrs. refers to increase.
         No Diff. refers to no difference.

A study of the milk consumption pattern indicated that all the category of BHs recognized the increase in their milk consumption. However, this increase did not extend to the women and this assumes significance in view of the extensive working hours pursued by them.

In case of cereals intake, only 17.5 per cent of the sample BHs felt a positive change and within the FBHs, 16.7 per cent felt an increase, while 83.3 per cent did not experience any increase in their cereal intake. Thirty three and 20 per cent of the FHHs and MBHs found a positive change in the intake of cereals while the rest of the BHs did not find any change.

For the whole sample, only 7.5 per cent of the total BHs, while only 5.6 per cent of the FBHs, 13.3 per cent of the MBHs and none of the FHHs felt that their intake of vegetables had increased. The impact of credit had failed to filter on the consumption of clothing and housing of BHs as no change in their consumption was reported. The data and the changes in the consumption pattern clearly indicate that the households gave preference to their basic need of food over clothing and housing. Thus, better food was attached greater importance by the households.

The above analysis reveals that granting loans for milch cattle does increase the milk intake of the BHs. However, this increase in the milk intake does not extend to the females of the household. Further, a marginal increase in the intake of cereals and vegetables of BHs was noticed. Category wise more number of MBHs found that their intake of both cereal and vegetables had increased. These changes had filtered only to the level of vegetables and that too for limited number of beneficiary households which suggests that BHs were attaching greater importance to improving the quality of food consumed.

6.1.4 CONCLUSION

The above analysis has revealed sharp gender differences in the employment and income impacts of credit at the household level. The comparision of the labour hours and the incremental incomes of all the categories of beneficiary

households [BHs] manifests :

- Higher employment and income generation by MBHs and all two loaned BHs.

- Lower employment and income generation by FHHs with one loan.

- Failure of the FHHs with two loans to render a higher incremental income than FBHs despite putting more effort in terms of labour hours.

Differences in the incremental incomes cannot be attributed to the gender of the beneficiaries as we have proved it otherwise (refer chapter eight).

However, out of the other numerous reasons leading to lower incremental income incase of FHHs with one loan, the reasons that surfaced were: inability to maximise benefits by putting in more efforts in terms of labour hours, lower family size, lower socio-economic status and poor quality of asset financed.

In wake of the above findings it becomes pertinent to note that 77 per cent of the FHHs were not granted additional dose of assistance inspite of their lower incremental income. Further, the policy makers not only need to acknowledge the deprived status of FHHs and grant credit through the main-stream program but it also becomes imperative for them to :

- Treat them as a special category;

- Impart professional training and necessary skill and information ;

- Supply them with modern inputs and marketing facilities; and

- Even frame an innovative credit scheme for them.

The incremental income from the asset financed is bound to be reflected in the changing consumption pattern of beneficiary households. A study of the consumption pattern of BHs indicated a positive change in the milk intake of BHs. However, in case of cereals, vegetables and clothing only a marginal increase was noticed for all the categories of beneficiaries.

6.2 Section II

6.2.1 THEORETICAL BACKGROUND

In the earlier section we have undertaken an analysis of the impact of credit on employment participation and income generation of beneficiary households [BHs]. The results indicated that labour participation and income generation had definitely and positively increased for women and all the category of BHs.

The results also showed that the women within each category were combining working on milch cattle with agricultural wage labour activity. This meant increased and arduous working hours for them. Further, as the BHs were surviving below the poverty line threshold they were also short of capital resources. Thus, in view of the scarce capital resources and the long working hours pursued by these women, it becomes pertinent to answer a few questions. Does increased labour participation lead to higher yields? Do the increase in expenses on the buffaloes lead to higher returns?

These are the questions that this section proposes to answer. In order to answer these questions it becomes necessary to find out the relationship between these aforesaid variables.

In view of this, the present section aims to explain the relationship between labour, capital and output by developing and estimating a production function.

6.2.2   PRODUCTION FUNCTION

The production function explains the technical relationship between the various inputs and output. Traditionally, social scientists have used the production function analysis to a wide range of areas from agriculture, horiculture, household industries to large scale industries.

Conventionally, the various inputs used in the production process are classified into four viz., land, labour, capital and organization. Both, the quantity and quality of these inputs have a bearing on the output.

The quality of inputs is accounted for by introducing a variable called, technology.

Thus, a production function can be written as:

$$Q = f(Ld, L, C, M, T)$$

where,

    Q = Output
    Ld = Land
    L = Labour
    C = Capital
    M = Management
    T = Technology

The measurement of each factor of production poses specific peculiarities and problems. In our analysis of milk production some of these factors of production either become irrelevant or are constant across the sample.

As the land utilized for the buffaloes is merely restricted to a small shed and as most of the sample beneficiaries are landless agricultural laborers, land as a factor of production becomes irrelevant. The technology employed also loses significance as BHs are merely using traditional ways of production due to their illiteracy, poverty and lack of technical training provided for maintaining the buffaloes under the Integrated Rural Development Programme.

The measurement of capital poses numerous problems. Capital is heterogeneous in nature and depreciates over time and therefore, adjustments are to be made while measuring it. In case of milch cattle, what is the nature of the capital? Is it the price at which it is bought? In case the price of two animals is the same, is the output from the two animals the same?

This leads us to consider another factor ie., maintenance. Better maintenance leads to an increase in the output. Therefore, the capital has to be a combination of the price of the animal and the maintenance expenses on it. The maintenance expenses can be called "working capital". It

includes expenses on dry fodder, green fodder, veterinary and other expenses.

Further, the data indicates that the purchase price of all the milch animals under consideration is almost the same. This stems from the fact that a beneficiary is required to purchase the cattle through an official agencies by full utilization of the fixed loan amount. Thus there is practically no variation in the price of the animal and hence the variable "fixed capital" can be dropped out from our production function analysis. However, there are variations in the working capital and hence we have included this variable in our analysis.

Being labour surplus households, labour assumes importance as a factor of production in milch cattle activity. As the labour employed is unskilled it is considered homogenous and is measured in terms of labour hours put in the process of milching.

In view of the above analysis, we have the following production function developed for our analysis:

$$Q = f(W,L)$$

where,

Q = Output
W = Working expenses
L = Labour

The above function assumes that output is an increasing

function of all the inputs i.e., there is a positive relationship between all the inputs and output.

Output (Q) is the monetary value of milk production. It has been calculated by multiplying the price of milk per litre by the total amount of milk produced. This method of monetizing the output brings homogeneity in the output as price of milk is determined by the fat content in the milk. Working Expenses (W) account for the total expenses incurred in managing the cattle during the time period of the study and is measured in terms of Rs.

Labour (L) refers to the labour hours put in by the beneficiary and spouse in tending to milch cattle.

Using the ordinary least square method, we have estimated the above function for the whole sample, and the two loan categories of it i.e., gender and loanwise.

These are:
1. Whole Sample (all beneficiaries)
2. Female Beneficiaries (FBHs)
3. Male Beneficiaries (MBHs)
4. Beneficiaries with One Loan (I Loan)
5. Beneficiaries with Two Loans (II Loans)

The estimated equations have the following functional form.

$$Q = B_0 + B_1 W + B_2 L + e$$

Here, B_0 is the intercept and B_1 and B_2 are the coefficients of W and L respectively. e is the error term.

REGRESSION RESULTS

In all, we have estimated five equations for each category of BHs presented in Table 6.6. The co-efficients of the variables are found to be significant.

Table 6.6

Regression Results

Estimated Equations	Intercept (B0)	Coefficient of K (B1)	Coefficient of L (B2)	R^2	N
1. Whole Sample	1057.35 [2.92]	0.768** [7.48]	1.441** [4.75]	0.46	118
2. FBHs	-347.38 [0.507]	1.036** [8.42]	2.337** [4.83]	0.56	89
3. MBHs	55.584 [0.33]	0.681** [3.48]	2.654* [2.54]	0.39	29
4. I Loan	903.62 [1.32]	0.775** [5.90]	1.500** 3.27]	0.41	66
5. II Loan	-534.09 [0.60]	0.748** [3.51]	3.854** [3.08]	0.38	52

[Figures in parentheses are the t-values]
** significant at 1% level
* significant at 5% level

FINDINGS

1. The estimated equations indicate that a Re. 1 increase' in the working expenses (W) would increase the output in the following manner :

In case of	Increase by (B1)
Whole Sample	Re. 0.76
FBHs	Re. 1.04
MBHs	Re. 0.68
I Loan	Re. 0.77
II Loan	Re. 0.75

The above findings suggest that it is not profitable to increase the expenses on maintenance as it results into less than proportionate change in the output except in the case of FBHs. In case of FBHs the maintenance expenses and output just break even indicating more efficient management by FBs of working capital expenses. It is primarily because of the fact that once the nominal food supply and health care to cattle is maintained, any further rise would increase the milk production rather marginally.

2. Unlike the values of the coefficients of working expenses (B_1) there are wide variations in the coefficients of labour input variable (B_2) across all the five categories of the sample. According to the results we find that by increasing the labour input by one hour the resulting increase in the output would be as follows:

In case of	Increase by (B1)
Whole Sample	Re. 1.44
FBHs	Re. 2.34
MBHs	Re. 2.65
I Loan	Re. 1.50
II Loan	Re. 3.84

The results suggest that increase in labour hours employed does increase the output. A comparison between FBHs and MBHs results point out that labour is more productive in case of MBHs than FBHs as an increase in labour input by one hour increases the milk output worth Rs.2.65 in the case of MBHs compared to Rs.2.34 in case of FBHs. The better output results of MBHs could be due to greater support of their spouses in labour contribution compared to the position in case of FBHs. As milch cattle is a female dominant activity, this higher participation in case of spouses of MBHs is easily accounted.

A look at the results of one and two loan category reflects the presence of increasing returns to scale in milk production. The increase in output in case of two loan is more than double the increase in output of one loan category. It means that when two cattle are kept than that results into more or increasing labour productivity. In other words, we can say that there are economies of scale in labour cost in case of two loans.

6.2.3 CONCLUSION

It is not profitable to increase the expenses on maintenance as it results into less than proportionate change in the output. Amongst the gender categories, the FBHs were

95

found to be making efficient use of working expenses while the MBHs were able to make efficient use of the labour input.

The results of one and two loan categories reflect a presence of increasing returns, while there are economies of scale in labour cost in case of two cases.

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