CHAPTER-VII

ECONOMIC RATIONALE OF CREDIT USE

1993
ECONOMIC RATIONALE OF CREDIT USE

In this chapter economic rationality of credit use in Bansdih block of Ballia district is analysed. It deals with the third objective of the present study and is based on cross-sectional examination of the data collected from the sample cultivators. The analysis in this part is confined the agricultural credit use by the cultivators in the area. This chapter consists of two parts, the first part examines the impact of changes in the level of selected agriculture investments on the volume of credit utilization in different size of holding groups and the second part examines the impact of resources on agricultural productivity as compared between beneficiary and non-beneficiary cultivators.

I

Credit Utilization : Influencing Factors.

As the result of the technological breakthrough in Indian agriculture, cultivators are tempted to use more of the capital to meet the cash requirements for different types of farm resources and inputs such as High Yielding Variety seeds, fertilizers, irrigation equipments and farm machinery etc. Inadequate and inefficient use of capital is presumed to be one of the most important causes of low productivity in agriculture. Credit has emerged as the most important input in agriculture in post-Green Revolution period. To fulfill the credit requirements of the cultivators for production of crop enterprises, the
co-operative credit institutions were restructured, commercial banks nationalised and expanded and RRBs were established. In this section functional formulation has been worked out taking utilization of agriculture credit as the function of some indirect influencing factors such as investment on own irrigation equipment, investment on draft cattle, expenditure on fertilizer and investment on farm machinery. This analysis has been undertaken in respect of the three operational size groups viz., marginal, small and medium and large, with the help of the Cobb-Douglas production function model described as below. This study is restricted to the agricultural credit beneficiaries only during the post-S.A.A. period.

The Model:

\[ C = a \cdot x_1^{b_1} \cdot x_2^{b_2} \cdot x_3^{b_3} \cdot x_4^{b_4} \]

Where,

- \( C \) = The Volume of credit (in Rs.).
- \( x_1 \) = Rupees invested on owned irrigations, equipments (Rs./farm).
- \( x_2 \) = Investment on draft cattle (Rs./farm).
- \( x_3 \) = Expenditure on fertilizers (Rs./farm).
- \( x_4 \) = Investment on farm machinery (Rs./farm).
- \( b_1 \) = Elasticities.
- \( a \) = Intercept.
The estimates of elasticity and statistical measures are presented in table 7.1.

The coefficients of multiple correlation (R) are 0.75, 0.68 and 0.69 for marginal, small and medium and large operational holding groups respectively. All these values are statistically significant indicating positive association between the selected variables and agricultural credit use. The coefficients of multiple determination (R)^2 are 0.5636 for marginal, 0.4713 for small and 0.4820 for medium and large operational holding groups respectively.

Table 7.1: Agricultural Credit Use.

<table>
<thead>
<tr>
<th>Operational Holding Groups</th>
<th>Number of beneficiaries</th>
<th>Elastici(\textsuperscript{ies})</th>
<th>(R^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Elasticity on investment owned irrigation equipment ((x_1))</td>
<td>Elasticity on draft cattle ((x_2))</td>
</tr>
<tr>
<td>Marginal</td>
<td>37</td>
<td>0.0738\textsuperscript{*}</td>
<td>0.0382\textsuperscript{@}</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0232)</td>
<td>(0.0279)</td>
</tr>
<tr>
<td>Small</td>
<td>27</td>
<td>0.0951\textsuperscript{**}</td>
<td>0.0317\textsuperscript{@}</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0326)</td>
<td>(0.0633)</td>
</tr>
<tr>
<td>Medium &amp; large</td>
<td>26</td>
<td>0.1006\textsuperscript{*}</td>
<td>0.0601\textsuperscript{*}</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0367)</td>
<td>(0.0228)</td>
</tr>
</tbody>
</table>

\textsuperscript{*} Significant at 0.05 level of significance.

\textsuperscript{**} Significant at 0.01 level of significance.

\textsuperscript{@} Non-significant.

(Figures under parenthesis are respective S.E. values).
operational holding groups. It indicates that the variations in agricultural credit used to the extent of 56.36 per cent in marginal, 47.13 per cent in small and 48.20 per cent in medium and large size groups is determined by the fitted equations. Comparatively lower \( R^2 \) values in small, medium and large operational groups are indicative of the possibility of other factors including non-productive use of agricultural credit by the cultivators.

It is evident from the elasticities (table 7.1) that investment on irrigation \((x_1)\) and fertilizer \((x_3)\) have positive and significant impact on the levels of agricultural credit irrespective of the scale of operation. On medium and large farms investment on draft cattle \((x_2)\) and on marginal farms investments on farm machinery and equipments \((x_4)\) significantly influences the level of agricultural credit use, besides, the investment on irrigation equipments \((x_1)\) and fertilizers\((x_3)\). The analysis further reveals that the impact of expenditure on fertilizers \((x_3)\) on the level of agricultural credit use is relatively higher on marginal and small farms, whereas the impact of the investment on owned irrigation equipments are relatively higher on medium and large farms.

II

Agricultural Productivity : Influencing Factors.

Agricultural economists treat agricultural productivity as the best suited parameter for the measurement of the status of agriculture between different regions and/ or groups of cultivators.
Recent researches in agricultural economics indicate that productivity has been most important factor influencing area allocation and priority accorded to different crop enterprises. Agricultural productivity in monetary terms is derivative of yield and price. The farm production decisions are influenced by agricultural productivity. Agricultural productivity is influenced by investments on different farm resources and inputs. Attempt was made under this study to examine the impact of farm resources and inputs on agricultural productivity in beneficiary and non-beneficiary cultivating households in the Bansdih block of Ballia district on the basis of primary data collected from a sample of 90 each with the help of the model presented below.

The model:

\[ Y = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + b_5 x_5 \]

Where,

- \( Y \) = Gross value of farm crop returns (Rs./ha.).
- \( x_1 \) = Rupees invested on owned irrigation equipment (in Rs./farm).
- \( x_2 \) = Investment on draft cattle (Rs./farm).
- \( x_3 \) = Expenditure on fertilizers (Rs./farm).
- \( x_4 \) = Investment on farm machinery (Rs./farm).
- \( x_5 \) = Operational area (in ha.).
- \( b_1, b_2, b_3, b_4, b_5 \) = Elasticities.
- \( a \) = Intercept.

This study revealed that the average productivity per hectare (Gross value of the crops produced per hectare) has been Rs. 6036.10 in the case of beneficiary cultivators and Rs. 5130.25
in case of non-beneficiary cultivators in the area under this study. The elasticities of the factors influencing agricultural productivity are presented in Table 7.2.

**Table 7.2: Factors Influencing Agricultural Productivity.**

<table>
<thead>
<tr>
<th>Resource</th>
<th>Type of cultivators</th>
<th>Regression coefficient</th>
<th>Mean level of resources</th>
<th>Marginal value of productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment owned irrigation equipment (Rs.) ($x_1$)</td>
<td>Beneficiaries</td>
<td>0.0802 *</td>
<td>1860.42</td>
<td>0.26</td>
</tr>
<tr>
<td></td>
<td>Non-beneficiaries</td>
<td>0.0284 (0.0125)</td>
<td>810.72</td>
<td>0.18</td>
</tr>
<tr>
<td>Investment on draft cattle (Rs.) ($x_2$)</td>
<td>Beneficiaries</td>
<td>0.0430 @</td>
<td>1525.00</td>
<td>0.17</td>
</tr>
<tr>
<td></td>
<td>Non-beneficiaries</td>
<td>0.0357 @ (0.1057)</td>
<td>1308.60</td>
<td>0.14</td>
</tr>
<tr>
<td>Expenditure on fertilizers (Rs.) ($x_3$)</td>
<td>Beneficiaries</td>
<td>0.1053 **</td>
<td>460.70</td>
<td>1.38</td>
</tr>
<tr>
<td></td>
<td>Non-beneficiaries</td>
<td>0.0860 ** (0.0386)</td>
<td>310.80</td>
<td>1.42</td>
</tr>
<tr>
<td>Investment on farm machinery (Rs.) ($x_4$)</td>
<td>Beneficiaries</td>
<td>0.0147 @</td>
<td>422.50</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>Non-beneficiaries</td>
<td>0.0082 @ (0.0179)</td>
<td>280.30</td>
<td>0.15</td>
</tr>
<tr>
<td>Operational area (hectares) ($x_5$)</td>
<td>Beneficiaries</td>
<td>0.0336 *</td>
<td>0.82</td>
<td>247.33</td>
</tr>
<tr>
<td></td>
<td>Non-beneficiaries</td>
<td>0.0294 * (0.0126)</td>
<td>0.79</td>
<td>212.43</td>
</tr>
</tbody>
</table>

**Significant at 0.01 level of significance.**
* Significant at 0.05 level of significance.
@ Non-significant.
(Figures in parenthesis are respective S.E. values).
The co-efficients of multiple correlation has been 0.7898 and 0.7638 in the two samples of beneficiary and non-beneficiary farmers. The values of the co-efficient are statistically significant. They indicate of the positive association between the selected variables and the agricultural productivity in both samples. The respective values of the co-efficients of multiple determination ($R^2$) are 0.6238 and 0.5834 for beneficiary and non-beneficiary samples. These indicate that the variations to the extent of Rs. 62.38 per cent on beneficiary farms and 58.34 per cent on the non-beneficiary farms are influenced by the fitted equations.

It is evident from the elasticities presented in the table 7.2 that on both beneficiary and non-beneficiary farms the level of the investment on owned irrigation equipments ($x_1$), expenditure on fertilizer ($x_3$), and size of operational holding ($x_5$) are statistically significant and positively influence the agricultural productivity. The influences of the investment on draft cattle ($x_2$) and farm machinery and equipments ($x_4$) on both type of holdings are statistically non-significant. The table further indicates that the investment on owned irrigation equipments and fertilizers are relatively higher on beneficiary farms, being Rs. 1860.42 and 460.70 per farm respectively on beneficiary farms in comparison to Rs. 810.72 and Rs. 310.80 per farm on non-beneficiary farms.

Since the agricultural productivity and the level of credit availed are both positively and significantly affected by the level of the investments on owned irrigation equipments
and expenditure on fertilizer on the both category of farms it can be concluded that the credit is used in the right direction and there is rational in use of credit by the farmers of the area under study. The investment of draft cattle, in view of its impact being non-significant on marginal and small farms can not be considered as rational. It can be further observed that the investment of credit for fertilizer is most rational in view of the comparatively higher marginal value productivity. There are evidences suggesting that though credit is channelised both to owned irrigation equipments and fertilizers, higher allocation to fertilizer application is economically sound. Since the productivity level of investment on both types of farms is higher than the cost, it shall be rational for the cultivators in the area to obtain credit for fertilizer application; similarly it shall be safer for lending agencies to advance loans for fertilizer application.