CHAPTER III
RESEARCH METHODOLOGY

The present chapter deals with the methodological aspects of the enquiry. The research methodology adopted for the collection, analysis and interpretation of data has been discussed under the following heads:

1. Sampling technique
2. Collection of data and method of enquiry
3. Period of enquiry and limitations of the study
4. Analytical tools

1. Sampling technique:

A multi stage stratified random sampling technique was used in the present study. In the first stage, the block was selected purposively, while in the second and subsequent stages, villages and the farmers were selected randomly.

(A) Selection of the block: Out of 14 blocks of district Btawal, one block namely Ajitmal, was selected purposively, where the branches of Central Bank of India, State Bank of India, District Co-operative Bank and Land Development Bank exist for financing agriculture. The convenience of approach and co-operative attitude of the farmers were the other reasons for this selection. Moreover this block represents the agro-climatic and socio-economic conditions of the district to a large extent.
(B) **Selection of villages**: In the second stage of sampling, a list of all the villages of the selected block where all the farm financing institutions viz., Central Bank of India, State Bank of India, Distt. Co-operative Bank and Land Development Bank were involved in making advances for agriculture, was prepared, with the help of officials of the Farm Financing Institutions and Development Block, Ajitmal. Out of this list, 10 villages namely Badera, Chitapur, Chitkapur, Sarai Imilia, Jagannathpur, Naviliya, Bhikhepur, Gopalpur, Samfar and Uncha were selected randomly.

(C) **Selection of farmers**: A list of all the farmers of the selected villages along with their cultivated area was prepared. The farmers were then classified into two categories viz., borrowers and non-borrowers. A sample of 100 farmers (50 borrowers and 50 non-borrowers) were then drawn from the universe of 10 villages under three size groups viz., small (0-2 hectares), medium (2-4 hectares) and large (4 hectares and above). The number of farmers under each size group was kept in proportion to their number in the universe.

The farmers who have taken loan for agricultural purposes from any of the Farm Financing Institutions were categorised as borrowers, while those who did not take any loan from any of the Farm Financing Institutions were treated as non-borrowers during the reference period 1979-81.

Thus, in all, the study was confined to an intensive inquiry of 100 farmers - 50 borrowers and 50 non-borrowers,
selected randomly under three size groups from 10 villages of block Ajitmal in district Etawah, U.P.

The distribution of the sample farmers in the selected ten villages of Ajitmal block is given in table III-1.

Table III-1: Distribution of the sample farmers under different size groups in the selected villages

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of selected village</th>
<th>Size group of the farm (hectares)</th>
<th>Total borrower</th>
<th>Non-borrower</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0-2</td>
<td>2-4</td>
<td>4 and above</td>
</tr>
<tr>
<td>1</td>
<td>Badera</td>
<td>3</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Chitapur</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Chitkapur</td>
<td>4</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Sarai Imilia</td>
<td>4</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Jagannathpur</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Haviliya</td>
<td>3</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>Bhikhepur</td>
<td>4</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>Gopalpur</td>
<td>3</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>Samfar</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Uncha</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>31</td>
<td>11</td>
<td>8</td>
</tr>
</tbody>
</table>

The total number of borrowers in the small size group was 31, medium size group 11 and in the large group 8. The number of non-borrowers in these three groups was 32, 12 and 6 respectively. The larger number in the small and medium groups can be attributed to their large population.

2. Collection of Data and Method of Enquiry

The primary data were collected by survey method through
Direct Personal interview with the respondents. The secondary data were collected from the block head quarters, district head quarters, farm financing institutions, journals, reports, official records, books etc.

The informations were collected with the help of schedules and questionnaires, prepared and tested in advance, covering all the aspects of farming viz.: area under different crops, cropping scheme, intensity of cropping, yield and income of various crops, cost of cultivation of different crops etc. and other primary information regarding farm finance of the selected farmers i.e. loan taken, source, amount, rate of interest, purpose, terms and utilisation etc.

In the course of investigation, several visits were made, from time to time, to collect reliable informations, keeping in view the convenience of the farmers. All possible care was taken to ensure the accuracy and reliability of the information. The information furnished by the respondents were properly edited through checks and counter checks. Help from Block officials, officials from Farm Financing Institutions, Village Pradhans etc. was also sought for obtaining correct and reliable data.

Limitations in the collection of data: Illiteracy and conservativeness of the cultivators were main hurdles in getting correct information. They hesitated in giving information, particularly regarding investment, expenditure, income, borrowings etc. However, the data were verified by cross questions. Not a single cultivator maintained records
of income and expenditure and savings on their farms. They supplied the relevant data on the basis of their memory.

3. Period of Inquiry

The study was conducted during the agricultural years 1979-80 and 1980-81.

4. Analytical Tools

The following statistical models and tools were used for analysis and interpretation of data.

(i) **Average**: The average given refers to the average of the aggregate value.

(ii) **Tabular analysis**: The tabular analysis was used to compare the values of costs and returns of major crop enterprises, labour, income, consumption, savings and investment pattern of different size group of farms.

(iii) **Lorenz curve**: The Lorenz curve was drawn to depict the uneven distribution of the cultivated area and income among farmers of different categories.

(iv) **Gini concentration ratio**: The inequalities were also estimated with the help of Gini concentration ratio. The Gini ratio is defined as "twice the area between Lorenz curve and egalitarian line". Hence, the more equal distribution, the closer the ratio is to zero, and higher the degree of inequality, the closer the ratio is to one.

Gini concentration ratio \( (L) = 1 - \frac{\sum_{j=1}^{n} P_j (Q_j + Q_{j-1})}{P} \)

where, \( P_j \) = Proportion of farmers in the \( j \)th group.
\( Q_j \) = Cumulative proportion of area/income in the \( j \)th group.

\( Q_{j-1} \) = Cumulative proportion of area/income in the \((j-1)\)th group.

\( n \) = Total number of area/income groups.

(v) Correlation: Simple correlation coefficients were calculated for the purpose of comparison and inferring trend and causal association. The following formula was used to work out the coefficient of correlation:

\[
 r = \frac{\sum xy}{\sum x^2 \cdot \sum y^2}
\]

(vi) Estimation of credit need: The credit need of the sample farmers has been calculated by preparing alternative plans on the basis of their farming practices in 1979-80. For this purpose, primary data relating to agricultural finance and crop production etc. were collected for the years 1979-80 and 1980-81. Formula for calculating total credit need is as follows:

(a) For small farmers having 0-2 hectares holdings
\[
 C_n = E_r - E_u + \frac{15C}{100}
\]

(b) For medium farmers having 2-4 hectares holdings
\[
 C_n = E_r - E_u + \frac{25C}{100} - \frac{40S}{100}
\]

(c) For large farmers having 4-above hectares holdings
\[
 C_n = E_r - E_u + \frac{30C}{100} - \frac{30S}{100}
\]

where, \( C_n \) = Total credit need

\( E_r \) = Value of recommended inputs through development of alternative plans

\( E_u \) = Value of inputs used
C = Capital asset for replacement/expansion

S = Net saving

The expansion and/or replacement of capital (C) has been assumed at 15 per cent, 25 per cent and 30 per cent of the capital assets respectively for small, medium and large farms. The investible savings of medium and large farmers has been assumed at 40 per cent and 30 per cent of their net savings respectively. Small farmers have little or no savings.

(vii) **Budgeting**: Budgeting approach has been used to estimate the extent of net saving for investment in agriculture in the following years.

(viii) **Farm growth rate based on credit needs**: The following model was fitted to the data to measure the credit need as related to farm-firm growth. The model incorporates the following variables.

(A) **Exogenous variables** - Rate of interest, proportion of the debt paid in each period and the maximum proportion of the values of the farm that the credit agency would loan.

(B) **Endogenous variables** - Net income, initial capital available for growth, proportion of net income and borrowed funds for expansion and indebtedness of the farm.

The present value of the farm is the sum of the discounted flow of the net income through time, thus:

\[
V_0 = N_0 + \frac{(1+g)^N}{1+i} + \frac{(1+g)^2N}{(1+i)^2}
\]
\[ v = \sum_{t=0}^{H} \frac{(1+g)^t N_0}{(1+i)} \]

where, \( N \) is the value of the productive resources of the farm and \( H \) is the length of time, the farm is expected to grow.

Substituting the capital for expansion:

\[ I_0 = r N_0 + \frac{t}{1+1} \left[ b \sum_{t=0}^{t} \left( \frac{1+g}{1+i} \right) t (l+g) N_0 - D_0 + PD_0 \right] \]

where, \( I_0 \) = (initial investment) = \( \frac{10C}{100} + S + B + R \)

- \( r \) is the proportion of the net saving and credit gap in the beginning of the year.
- \( N_0 \) is the net saving.
- \( i \) is the rate of interest.
- \( b \) is the maximum proportion of the value of the farm that credit agency would loan.
- \( t \) is the number of years.
- \( g \) is the growth rate of the farm.
- \( D_0 \) is the indebtedness of the farmers.
- \( P \) is the proportion of debt repaid each year i.e. \( P = \frac{1+i}{T} \)
- \( C \) is the sum of the value of the capital structure.
- \( S \) is 30 per cent and 40 per cent of the total savings for farms of 4 hectares and above and 2-4 hectares size groups respectively.
- \( B \) is borrowed money
- \( R \) is rental value of land.

(ix) Cost concepts: Generally four cost concepts, namely Cost A, Cost A', Cost B and Cost C have been followed in various Farm Management studies. The input items included
under these costs are given as under:

Cost A: This cost approximates the actual expenditure incurred in cash and kind. It includes values of

(i) Hired human labour,
(ii) Hired and owned bullock labour,
(iii) Seed, manures (farm produced or purchased) and fertilizers,
(iv) Hired machinery charges,
(v) Owned machinery labour,
(vi) Insecticides and pesticides,
(vii) Irrigation charges,
(viii) Depreciation on implements and farm buildings,
(ix) Land revenue and other taxes,
(x) Interest on working capital including crop loans, and
(xi) Miscellaneous expenses (artisan etc).

Cost A₁: Cost A + rent paid for leased in land.

Cost B: Cost A₁ + imputed rental value of owned land (less land revenue paid thereon) + imputed interest on owned fixed capital (excluding land)

Cost C: Cost B + imputed value of family labour.

As no leasing activities were reported on the sample farms, Cost A and Cost A₁ are synonymous.