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CHAPTER III

METHODOLOGY OF RESEARCH

This chapter deals with the methodology including the description of the study area, database, sampling design and analytical tools employed. The methodology is presented under the following sections:

3.1 Description of the area under study

3.2 Data base

3.3 Sampling design

3.4 Statistical techniques employed

3.5 Viability model

3.1 Description of the area under study

The study was undertaken primarily to evaluate the performance of select PACS in Bangalore District of the state of Karnataka with special emphasis on comparative analysis of viable and non-viable societies, besides identifying the factors determining the performance of PACS. The study covers the period from 1986-87 to 1999-2000.

The state of Karnataka, which is situated between 11° 31’ and 18° 43’ north latitude and 74° 12’ and 78° 40’ east longitudes and lies in the western central part of peninsular India. It is bound in the north by Maharashtra, in the north-west by Goa, in the south and south-west by Kerala and in the west by the Arabian Sea. The state covers an area of 1,91,791 sq. kms. occupying 5.84 percent of the total geographical area
of the country. The population of the state according to the 2001 census (provisional) was 527,33,958 (with 268,56,343 males and 258,77,615 females). In terms of area, Karnataka occupies eighth place among the states in the country arranged in the descending order. The state has 27 districts and 175 Taluks. Among the districts of the state, Bijapur occupies the largest geographical area with 8.9 per cent of the area and Kodagu district has the smallest area with only 2.14 percent. Bangalore is the most densely populated district with the density of 618 persons per sq. km. and Uttara Kannada has the lowest density, with barely 104 per sq. km. The state has four revenue divisions, 175 taluks, 745 hoblies, 27,066 inhabited villages and 2127 uninhabited villages.

Karnataka has a total of 4411 PACS. Of which the maximum number of PACS are in Belgaum (526) and the least number of PACS are in Bangalore Urban District (41). Since the present study is mainly an attempt to evaluate the performance of PACS, a purposive sampling design has been adopted so as to cover the maximum possible number of variables considered crucial for evaluation.

3.2 Data Base

The state of Karnataka at present has 27 districts. For collection of macro level time series data, the study however confines to the erstwhile 20 districts only, that is, only to those prior to the creation of new districts. The data on short-term cooperative credit societies are collected from the annual reports of select PACS maintained in the
evaluation cell of the office of the Registrar of Cooperative Societies, Bangalore. The primary data for the period (1996-2001) were collected from select PACS by using the schedule of questions through direct personal interview method. The exercise involved collection and analysis of data on variables influencing the performance of select PACS and delineated the indicators of non-viable societies (NVS). For this purpose the financial data were collected in the form of balance sheet and other official documents. The data so collected from select PACS were cross-checked with the accounts/audited reports maintained in the DCCB to ascertain the validity of the data. Apart from this, physical data were also collected in order to capture the institutional factors influencing the performance of PACS.

As mentioned earlier, the study covers the period from 1986 – 87 to 1999-2000 as the data on the number of societies, borrowing members, credit advances, overdues etc. (district-wise), were available from 1986 – 87 onwards only. Also the logic of selecting this time frame was that the reorganization of the PACS took place in the year 1978–79 following the recommendations of the working group on cooperation during the Fifth Five Year Plan (RBI, 1981, p. 47). However, the primary data is collected and analysed for the period 1996 – 2001.

Cooperatives were chosen in such a way that the subsequent reorganization did not affect the sample list – i.e., the cooperatives from
which the data were collected were left untouched by the process of reorganization.

3.3 Sampling design

Classification of societies into viable and non-viable was done for varying periods, though researchers using this type of sampling have opined that it would be difficult to interpret / discriminate the ability of the discriminant function if the two groups (namely V and NV) were vastly unequal in size. It has also been argued that there are no compelling reasons for any *priori* proportions to be followed (Manrice and Tollefsory, 1975). It can be seen that the sample design adopted in the study has theoretical validity, since the sample proportions do not differ significantly in size.

The area under study namely, Bangalore district, is one of the pioneering districts in the cooperative movement. It has a rich tradition and cultural background for supporting the cause of the members of primary level societies. The Bangalore district has in all 196 PACS, of which 155 are in Bangalore Rural District and the remaining 41 are in Bangalore Urban district. The present study chose 5 percent of the total PACS for in-depth analysis, of which 8 were in Bangalore Rural District and 2 in Bangalore Urban District. This choice was based on the *Principle of Equal Representation* for each group that is, the need to choose both viable and non-viable PACS on proportionate basis. The principle is justified on the ground that when the sample societies are
placed on similar footings in terms of membership, share capital, loans, advances, etc., with a marginal degree of flexibility it would help draw meaningful inferences.

3.3.1 Sampling Frame

<table>
<thead>
<tr>
<th>SL No</th>
<th>Type</th>
<th>Place</th>
<th>Taluka</th>
<th>District</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Viable</td>
<td>Bukkasagara</td>
<td>Anekal</td>
<td>Bangalore Urban</td>
</tr>
<tr>
<td>2.</td>
<td>Viable</td>
<td>Gantiganahalli</td>
<td>DB pur</td>
<td>Bangalore Rural</td>
</tr>
<tr>
<td>3.</td>
<td>Viable</td>
<td>Nalluru</td>
<td>Devanahalli</td>
<td>Bangalore Rural</td>
</tr>
<tr>
<td>4.</td>
<td>Viable</td>
<td>Narayanapura</td>
<td>Kanakapura</td>
<td>Bangalore Rural</td>
</tr>
<tr>
<td>5.</td>
<td>Non-Viable</td>
<td>Archakara halli</td>
<td>Ramanagaram</td>
<td>Bangalore Rural</td>
</tr>
<tr>
<td>6.</td>
<td>Non-Viable</td>
<td>Averahally</td>
<td>Ramanagaram</td>
<td>Bangalore Rural</td>
</tr>
<tr>
<td>7.</td>
<td>Non-Viable</td>
<td>Channarayapatna</td>
<td>Vijayapura</td>
<td>Bangalore Rural</td>
</tr>
<tr>
<td>8.</td>
<td>Non-Viable</td>
<td>Harohalli</td>
<td>Harohalli</td>
<td>Bangalore Rural</td>
</tr>
<tr>
<td>9.</td>
<td>Non-Viable</td>
<td>Konnaghatta</td>
<td>DB Pura</td>
<td>Bangalore Rural</td>
</tr>
<tr>
<td>10.</td>
<td>Non-Viable</td>
<td>Ravugodlu</td>
<td>Anekal</td>
<td>Bangalore Urban</td>
</tr>
</tbody>
</table>

3.3.2 Approach to the Study

The study was conducted in two parts, the first part is devoted to the analysis of the growth and the factors that influence the
performance of PACS, while the second part deals with the performance of PACS and causes for their non-viability.

For the purpose of the study, *a priori classification* of the cooperatives was made on the basis of the following criterion. A cooperative would be considered non-viable if it suffered a negative operating cash flow for a period of three years continuously and registered a fall in the net worth, eventually heading towards zero or a negative net worth.

The balance sheets of cooperatives might project a different picture as regards financial results. They may not show surpluses by distributing the profits in the form of patronage refund or price differential. Hence considering profitability as a sign of non-viability is questionable. But this does not mean that a cooperative would show losses in order to distribute the price differential. In case the policy is not to show the profits, but to distribute the returns on a transaction basis, the cooperatives would be attaining break-even.

Using the above definition for classifying the cooperatives into viable and non-viable *a priori* was justifiable on the following grounds. A negative operating cash flow, which is computed after adding back notional expenses such as depreciation and provisions, is in itself a definite indicator of non-viability. This classification is supported by earlier studies which have defined non-viability of cooperatives in similar
terms such as cash losses (RBI, 1978) and non-payment of dividends (Yadav 1986, Gupta and Shekar 1988).

3.4 Statistical Techniques employed

Keeping in view the objectives of the study and to test the hypotheses, a combination of different statistical tools was employed. The methods of analysis employed were tabular analysis, percentage and ratio analysis, growth rate functions, multiple regression analysis, multiple discriminant analysis, Likert's summated technique, etc. Each of these tools is explained as below:

3.4.1 Growth Rate Analysis

In order to evaluate the pattern of growth rate of the PACS over a period of time, different indicators have been considered. The compound growth rates (CGR) have been estimated for the following indicators.

1. Number of societies
2. Membership
3. Share capital
4. Members' contribution
5. Government's share
6. Working capital
7. Deposits
8. Loans advanced
9. Loans recovered
10. Loans outstanding
11. Loan overdues
The exponential function of the following type was employed to estimate the growth rates. The growth rates for the above mentioned indicators were calculated by using the equation:

\[ Y = AB^t \]  \hspace{1cm} (1)

Where

\[ Y = \text{Indicator} \]
\[ A = \text{Constant} \]
\[ B = \text{Regression coefficient} \]
\[ t = \text{time period (Years)} \]

In the logarithmic form the exponential function can be expressed as

\[ \log Y = \log A + t \log B \]  \hspace{1cm} (2)

\[ \log A \] and \[ \log B \] are obtained by the OLS method. The coefficient of determination \( R^2 \) is computed in order to know whether the exponential function is appropriate or not.

\[ B = 1 + r \]  \hspace{1cm} (3)

Hence \[ \log B = \log (1 + r) \]

The compound growth rate (CGR) was derived from the following equation

\[ \text{CGR} (r) = \text{anti log} \left[ \log (1 + r) \right] \times 100 \]  \hspace{1cm} (4)
3.4.2 Tabular Analysis

To evaluate the performance of PACS in terms of the following parameters, tabular analysis was employed.

1) Average membership per society
2) Share capital per society
3) Share capital per member
4) Percentage of share capital to working capital
5) Percentage of government’s contribution to total share capital
6) Deposit per member
7) Percentage of deposits to working capital
8) Working capital per member
9) Loans issued per member
10) Proportions of short and medium term loans to total loans
11) Loans recovered per member
12) Loan overdues per member
13) Percentage of overdues to outstanding loans.

3.4.3 Measurement of Members’ Perceptions about the functioning of PACS

The perceptions of members about the working of PACS were measured through attribute statements prepared on the basis of theoretical and field experience of the researcher gained from visits to different PACS in the study region. The perception statements or attributes for each set of functions were listed as indicated in respective
tables in chapter four. The responses of sample farmers were weighted as given below to quantify the intensity of the members' perceptions.

<table>
<thead>
<tr>
<th>Response attribute:</th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Neutral</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Do not Agree</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

Likert's Technique summated rating scale was employed in constructing the attitudinal scale. Two judgement categories were described against each statement. The categories were 'Yes' or 'No'. These judgements were assigned weights of 2 and 1 varying from 'do not agree' to 'agree' and zero to neutral response.

3.5 Viability Model

The primary task of any cooperative is to promote economic interest of its members. In order to accomplish this objective, a cooperative must ensure operational efficiency, which in turn depends closely on how well its finances are managed. Non-performance on the financial front reflects failure in the overall performance of the cooperative business. The cooperatives are particularly handicapped by the lack of a standard tool to measure their financial performance. The present study attempts, *inter alia*, to develop a viability model for efficient functioning of PACS.
3.5.1 Construction of the Scale

The variables included in the construction of the viability scale are taken from the audited accounts of 10 PACS for the five-year period 1996-2001. The five-year average values of variables are considered as it has been established (Gupta, 1991) that five-year averages are more reliable than the values for any single year. Only ten variables were selected for constructing the viability scale so that undue influence of powerful variables included in the scale is weeded out. The scaling technique has an in-built system to eliminate the insignificant variables.

These standard variables are also converted into score values on a ten-point scale obtained from deciles of standard normal distribution. To check the consistency of the variables included in the scale, i.e., whether the score value for a variable is in agreement with the total score value, the correlation coefficient of the score of each variable with the total score was calculated. If the correlation coefficient is significant, it is presumed that the selected variables are appropriate. The seven variables with correlation coefficients significant at 0.001 significance level are retained for further analysis and the remaining variables are deleted at this stage.

3.5.2 Conceptual Framework

The theory of business organization has been used to study the factors influencing the viability of PACS (Bhattacharjee, 1998). The market in which these cooperative institutions operate tends to be
imperfect and oligopolistic. The former is because loan business involves dealing in future transactions and the latter is because only a few financial institutions operate in rural areas as a result of which they tend to maximize their turnover subject to maintaining minimum level of profits as in the case of firms in oligopolistic markets (Baumol, 1970). In addition to PACS, other institutions like commercial banks, RRBs, private banks operate in rural areas. All these institutions have similar loan business and also have to remain viable subject to the fulfillment of certain stipulations as laid down by the RBI from time to time. A multivariate econometric model was developed to examine the relative influence of factors determining the viability of PACS.

Like other business organizations, the PACS generate their income from various products / services. These products / services include:

a) Sale of agricultural inputs (SAI)
b) Sale of consumer goods (SCG)

c) Commission on marketing produce (CMP)
d) Income from lending business (ILB) and
e) Income from deposit mobilization (IDM)

The business of PACS includes mainly five services, they are sale of inputs, lending, sale of consumer goods, commission on marketing produce and deposit mobilization. The percentage share of these services in the volume of business is considered to examine their relative
influence on viability. These shares are expected to have a positive influence on the viability of PACS.

Another important determinant of viability is the delinquency ratio, i.e., loan overdue as a percentage of loan due for recovery or demand on loan. This is supposed to have a negative influence on the viability of PACS.