Chapter 3
RESEARCH MEHODOLOGY

3.1 Statement of the Problem

Livestock related interventions are found to be a successful strategy for poverty alleviation all over the world and large percentage of rural population depend on livestock rearing to earn their livelihood. About 600 million poor smallholders in the world keep nearly one billion heads of livestock and livestock contribute 40% percent of the global value of agricultural output and support the livelihoods and food security of almost a billion people. (FAO, 2009)

Livestock keeping is a livelihood option in rural India with smallholders and landless farmers together control 75% of country’s livestock resources. Since the livestock wealth of India is mostly distributed among the marginal and small landholders, any growth in the sector would be beneficial to the poor people of rural India.

Dairy Farming is a major livestock enterprise in India where small and marginal farmers are engaged to earn their livelihood. India has emerged as the largest producer of milk in the world in 2001 with an annual production of 84 million tonnes and continues to occupy the top position in the subsequent years and in the year 2008-09, the milk production was 108.5 million tonnes.

The World Bank funded Operation Flood (OF) Programme commonly known as ‘White Revolution’ was instrumental for enhancing the milk production in the country. The importance of Operation Flood programme was that it had focused on small rural producers and their producer organizations were established all over the country for sustainable dairy based enterprises in the rural villages of India. The Operation Flood programme was
modelled on the Anand Pattern Dairy Co-operatives, referring to their origin in Anand District in the State of Gujarat. This was comprised of a three tier system with village level dairy co-operative societies (DCSs), which promote district level union, which in turn promote the state level marketing federation. The Anand model was replicated all over the country under Operation Flood Programme with *decentralized milk production by small milk producers, milk procurement by primary dairy co-operatives of milk producers, centralized milk processing by union of dairy co-operatives and marketing of milk and milk products done by federation of unions*. The primary milk producers govern the entire three tier structure to ensure that the gains at all levels come back to the benefit of the primary milk producers. The core concept of Anand model was that the farmers have control on all stages of diary business starting from production to marketing. A good number of evaluation studies of Operation Flood project have commented that Dairy co-operative movement in India has always helped to provide a safety net to the rural poor, the most vulnerable and marginalized sections of the population which otherwise suffer the worst consequences of any economic crisis (Scholten, 2011). Dairy co-operatives have created the necessary infrastructure and marketing networks for dairy farming in the country.

Kerala Co-operative Milk Marketing Federation (KCMMF) popularly known as MILMA was established in 1980 for the successful implementation of Operation Flood project in Kerala replicating the Anand Model Dairy Co-operative system. At present the MILMA Federation consists of 8.31 lacs dairy farmers of 2678 village level primary milk co-operatives organized under three Regional Milk Producers Unions. During the Operation Flood period (1980-96), MILMA provided leadership in all aspects of dairy development in the state viz., formation of village level dairy co-operatives, programmes for enhancement of
milk production, diary extension and veterinary services and training of dairy farmers, procurement, processing and marketing of milk and milk products including the price control of milk in the market. The milk production in the State has increased considerably and MILMA was even struggling to manage the excess milk through production of value added products and by applying various marketing strategies to increase the sale of milk in the state.

In the post Operation Flood period, especially from 2003 onwards the milk production in the state has declined and a growing dissatisfaction was noticed among dairy farmers and many farmers have given up the dairy farming in search of better livelihood options. The return on investment was very low and available subsides and schemes were not very effective to address the problems of the field. Inadequate feed and fodder, low productivity of the cross breed animals and limited availability of veterinary services and poor dairy management practices among the farmers are the reported problems of the dairy sector in Kerala. The existing polices and programmes in the sector are not effective in finding lasting solutions to the persisting problems. Many a time programmes are planned and executed by officials without necessary grass root level consultation with farmers and their organizations. Animal Husbandry is not granted an equal consideration with agriculture in terms of subsidies and other services from the governmental and banking institutions. The credit facility is not adequate for dairy farming with farmers have to pay around 12 per cent interest for loans for dairy farming while agriculture enterprises are granted credit at four per cent by the banking institutions. It is also observed that there is no proportionate return from dairying due to the increased cost of milk production. The cost of milk production has gone up in the State with the escalating cost of cattle feed and fodder. The governmental regulation of the price of milk in the market has also affected the profitability of farmers from dairying. The
inadequate governmental support and the emerging adverse grass-root situation in the dairy sector are endangering the livelihood option of the marginal framers.

In the context of adverse situations of constraints the farmer based producer organizations (co-operatives, associations) are considered as an option for small farmers to unite and stand together to overcome the hurdles in earning a decent livelihood in livestock rearing. Though MILMA is a farmer producer organization with adequate organizational strength and capabilities, the existing government policies in dairy sector, formulated after the Post Operation Flood period are adversely affecting the socio-economic empowerment of the small and marginal farmers in the State of Kerala in spite of the increasing demand for milk and milk products in the country. The recent efforts of the Government of Kerala to support the dairy farming in the State has helped to reverse the negative trend in milk production from the financial year 2005-06 onwards but the ground realities are still not very conducive for the marginal farmers. In this context, the present study envisaged to understand the situation of Village Milk Co-operatives in Kerala in the post Operation Flood period is significant. Here, an attempt has been made to analyze the multiple aspects of village dairy co-operatives to identify the problems and prospects of diary sector in Kerala.

3.2 Objectives of the Study

General Objective

To understand the present scenario of the Village Milk Co-operatives in Kerala with special reference to the Anand Pattern Co-operative Societies (APCOS)

Specific Objectives

1. To inquire and describe the socio-economic profile of the dairy farmers who are supplying milk to the village milk co-operatives
2. To examine the various aspects of dairy farming and the major problems encountered by the farmers in dairying
3. To analyze the knowledge/awareness of dairy farmers regarding the policies and programmes in the dairy sector
4. To understand the perception of members of the village milk co-operatives about the concept of co-operation - *co-operative identity, values, principles* and their commitment to the village milk co-operatives
5. To examine the extent of participation of the dairy farmers in the activities of the village milk co-operatives as well as the development activities of the village.
6. To assess the role and effectiveness of leadership exercised by the presidents on the functioning of the village milk co-operatives
7. To find out the extent of utilization of existing support services and linkages of the dairy sector by the dairy farmers
8. To assess the various community assets-*resources and facilities* generated/created by the village milk co-operatives
9. To recommend appropriate measures/action programmes for the effective functioning of the village milk co-operatives

**3.3 Hypotheses**

1. There is significant difference between farmers with and without training in dairy farming in their mean scores of success factors adopted in dairy farming.
2. There is significant difference between member dairy farmers and non-member dairy farmers in their level of awareness regarding programmes in dairy sector
3. There is a positive correlation between the perception on co-operation and commitment to the organization among the members of dairy co-operative society
4. There is significant relationship between membership positions in dairy co-operative society and level of participation of members in programmes of dairy co-operative and local community
5. There are significant correlations between the perception of co-operation, commitment, awareness, participation and leadership effectiveness of the Presidents of dairy co-operatives.

3.4 Definition of Major Concepts

3.4.1 Village Milk Co-operatives

Conceptual

Village level co-operative institution where members supply their surplus milk and buy the various services provided by the co-operatives (NDDB, 2010)

Operational

In the present study, village milk co-operatives refer to the Dairy Co-operative Society (DCS) functioning at the village level for the dairy farmers. The DCS in the context of Kerala is also known as Anand Pattern Co-operative Society (APCOS).

3.4.2 Co-operation

Conceptual

"Co-operation is self-help and each for all (mutual-aid). Self-help means the pride of supplying one's own needs by one's own resources, of being one's own merchant banker, money lender and employer. "Each for all" means to seek liberation, not only for oneself but for and through others" (Charles Guide, Economic Historian)

Operational

In the context of the study co-operation is understood as the practice of self-help and mutual aid by the members of the village milk co-operative society.

3.4.3 Co-operative

Conceptual

“Co-operative is an autonomous association of persons united voluntarily to meet their common, economic, social and cultural needs and aspirations through a
jointly owned and democratically -controlled enterprise" (The International Co-operative Alliance (ICA), 1995)

Operational

The *co-operative* in the present study is understood as village level milk co-operative society.

### 3.4.4 Co-operative Identity

**Conceptual**

The qualities of a co-operative organization which make it different from other organizations, i.e., it’s’ values and principles. Co-operatives are based on the values of self-help, democracy, equality, equity, and solidarity. The members of co-operatives believe in the ethical values of honesty, openness, social responsibility, and caring for others. The seven co-operative Principles are guidelines by which co-operatives put their values into practice. Principles that co-operatives subscribe to are:

1. Voluntary and open membership
2. Democratic member control
3. Member economic participation
4. Autonomy and independence
5. Education, training and information
6. Co-operation among co-operatives
7. Concern for community (ICA, 1995)

**Operational**

*Co-operative identity*, in the present study refers to the extent of practice of co-operative values and principles and unity (oneness) by the members of village milk co-operatives.

### 3.4.5 Perception

**Conceptual**

The process by which people translate sensory impressions into a coherent and unified view of the world around them, though necessarily based on incomplete and unverified (or unreliable) information, perception is equated with reality for
most practical purposes and guides human behaviour in general. (www.businessdictionary.com, 2011)

Operational
In the present study perception refers to the opinion, views and understanding the dairy farmers were having about the co-operative organizations.

3.4.6 Knowledge
Conceptual
Understanding of or information about a subject which a person gets by experience or study, and which is either in a person's mind or known by people generally (Dictionary.cambridge.org, 2011)

Operational
In the context of the study, it is the understanding the dairy farmers are having about the co-operative organizations.

3.4.7 Awareness
Conceptual
Knowledge that something exists, or understanding of a situation or subject at the present time based on information or experience (dictionary.cambridge.org, 2011)

Operational
In the context the study, it is regarding the experiential knowledge the dairy farmers have obtained about the co-operative organizations.

3.4.8 Participation
Conceptual
Participation is a process through which stakeholders influence and share control over development initiatives and the decisions and resources which affect them.’ (World Bank, 1994)

Operational
In the present study, participation means involvement of dairy farmer members in decision-making processes and implementation and evaluation of the activities of the Village Milk Co-operatives and their involvement in the welfare as well as development programmes of the village.
3.4.9 Leadership

Conceptual
A reciprocal relationship in which an individual exerts social influence over cooperating individuals to promote the attainment of group goals. (Brown, 2006)

Operational
In the present study, leadership refers to the leadership roles exercised by the president of village milk co-operative society.

3.4.10 Leadership effectiveness

Conceptual
Success in influencing people to strive willingly for group goals (www.education.com, 2010)

Operational
In the present study, leadership effectiveness means the extent of success by the presidents in accomplishing the recognized objectives of the village milk co-operatives.

3.4.11 Support service

Conceptual
Activity or function required for successful completion of a process, programme, or project (www.businessdictionary.com, 2011)

Operational
In the present study support service refers to the services provided by departments of Animal Husbandry, Dairy Development, Agriculture and Financial Institutions for dairy development in the State.

3.4.12 Linkages

Conceptual
Relationships and interactions between tasks, functions, departments and organizations, that promote flow of information, ideas, and integration in achievement of shared objectives. (www.businessdictionary.com, 2011)
Operational

*Linkages* in the present study refers to the formal relationships and interactions APCOS’ have developed with the various agencies involved in dairy and allied sectors

### 3.4.13 Community Assets

**Conceptual**

Community assets are the stock of wealth or facilities that are accessible to a wide variety of groups in the community. In an asset based community development framework these include gifts, skills, and capacities of individuals, associations, local institutions, and organizations (Kretzmann & McKnight, 1993)

**Operational**

In the present study community assets are resources and facilities established in the village under APCOS, which includes the infrastructure facilities of APCOS and the organizational strengths of APCOS as a local milk producer co-operative organization.

### 3.4.14 Development Activities

In the present study it is understood as planned action undertaken by members of village milk co-operatives to address the problems/issues of the locality.

### 3.4.15 Members

Members in the present study refer to the dairy farmers who are having membership in the village milk co-operative society.

### 3.4.16 Commitment

In the present study, commitment means the belongingness, affection and loyalty expressed by the members towards their dairy co-operative society.
3.4.17 Socio-economic profile

In the present study, socio-economic profile implies the personal variables of the dairy farmers such as age, gender, education, caste, membership in organizations and family profiles such as family size, income of the family, occupation of family members and land holding of the family.

3.4.18 Dairy Farmer

In the present study, dairy farmer refers to the person who rears cattle either as a main occupation or subsidiary occupation for the purpose of milk production. The milk production may be for household consumption or for sale or for both.

3.5 Pilot Study

The researcher had held preliminary discussions with the officials of the departments of Dairy Development and KCMMF (MILMA) regarding the relevance and feasibility of the study. The researcher also visited four village milk co-operatives in Trivandrum district and interacted with the dairy farmers to understand the field level practical problems concerning the proposed study on dairy societies.

3.6 Research Design

The design of the study is mainly descriptive in nature with correlation components built into it. The study is intended to describe as well as to compare the various aspects of Village Milk Co-operatives across the three regions of Kerala Co-operative Milk Marketing Federation (KCMMF). The study also tried to find out the correlation that exists between the perception of dairy farmers on co-operation and their commitment to the dairy co-operative society and the relationship between the membership position in
dairy co-operatives and members’ level of participation in the programmes of the Village
Milk Co-operatives and the Local Community.

3.7 Universe/Population

Population

There are two populations in this Study 1. Village Milk Co-operatives in Kerala 2. The
dairy farmers who are pouring milk in the Village Milk Co-operatives

As per the statistics of GOK, in the year 2009-10, there are 2678 Village Milk Co-
operatives under the Kerala Co-operative Milk Marketing Federation (KCMMF) with
8.40 lakhs dairy farmers who are pouring milk in the Village Milk Co-operatives in the
State.

3.8 Unit of Analysis

There are two units of analysis in this study 1. The Village Milk Co-operatives and the
President/Secretary is the respondent. 2 Each household (family) of the dairy farmer and
the farmer who supplies milk to the Village Milk Co-operative is the respondent in the
interview.

3.9 Sampling Procedure and Sample size

Multi stage random sampling was used in the selection of the Village Milk Co-operatives
and purposive sampling was used in the selection of dairy farmers.

The multi stage random sampling was adopted in the selection of the Village Milk Co-
operatives because the area of the study is widespread and the population elements are
already grouped in to subpopulations and a list of those subpopulations are available. (Rubin
& Babbi, 2005) The lists of the Village Milk Co-operatives (popularly known in Kerala as
**Anand Pattern Co-operative Society (APCOS)** with details of their classification are available at Block level office of the Dairy Development Dept. of Government of Kerala.

The *purposive sampling* was adopted in the selection of the dairy farmers to ensure the widest variety of respondents namely the dairy farmers belonging to the subgroups of women, backward classes, landless farmers, farmers whose major occupation is dairying and farmers who are holding positions in the governing board of APCOS.

**Selection of APCOS**

The Kerala Milk Marketing Federation (KCMMF) comprises Three Regional Milk Producers Unions, viz., Trivandrum Regional Co-operative Milk Producers Union (TRCMPU), Ernakulam Regional Co-operative Milk Producers Union (ERCMPU) and Malabar Regional Co-operative Milk Producers Union (MRCMPU). The village milk co-operatives (APCOS) of the southern districts (Trivandrum, Kollam, Pathanamthitta, Alleppey) of the State are affiliated to TRCMPU and of the central region (Ernakulam, Trichur, Idukki and Kottayam Districts) to ERCMPU and of the northern districts (Palakkad, Malapuram, Kozhikode, Wayanad, Kannur and Kasaragode) to MRCMPU.

From each region, one district each was selected and from each of the selected districts, four Dairy Development Blocks were selected and from each of the selected Blocks, three APCOS were selected, one each from A, B, C categories according to the audit classification of APCOS. Altogether 36 APCOS were selected for the study with 12 each from A, B, and C categories. Hence the sample size for the population of village level Anand Pattern Co-operative societies (APCOS) in Kerala was 36. The Secretary/President of the APCOS was the respondent who has provided the data about APCOS.
Selection of dairy farmers

Ten dairy farmers each were selected from each of the identified APCOS, constituting a sample size of 360, who are supplying milk to APCOS. The following table has given the details of sample size.

Table 3.1 Distribution of Sample according to the Regions, Selected Districts and Blocks

<table>
<thead>
<tr>
<th>Region</th>
<th>Selected district</th>
<th>Selected blocks</th>
<th>Selected No. of APCOS</th>
<th>Selected No. of farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trivandrum</td>
<td>Trivandrum</td>
<td>Athiaynoor</td>
<td>3</td>
<td>120</td>
</tr>
<tr>
<td>(Southern)</td>
<td></td>
<td>Nemam</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vamanapuram</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Varkala</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Ernakulam</td>
<td>Kottayam</td>
<td>Kaduthurathy</td>
<td>3</td>
<td>120</td>
</tr>
<tr>
<td>(Central)</td>
<td></td>
<td>Madapally</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pallam</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uzhavoor</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Malabar</td>
<td>Palakkad</td>
<td>Alathur</td>
<td>3</td>
<td>120</td>
</tr>
<tr>
<td>(Northern)</td>
<td></td>
<td>Chittur</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Malampuza</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nenmara</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>36</td>
</tr>
</tbody>
</table>

|               |                   |                 |                       | 360                     |

3.9.1 Inclusion and Exclusion Criteria

Inclusion criteria

- President of APCOS and one member from Governing Board of APCOS
- One member each from SC/ST, Women and BPL sections
- One non-member (who is supplying milk to APCOS but not a formal member of APCOS)
• One member whose major occupation is dairy farming

• Any other three members who are supplying milk to APCOS

*Exclusion criteria*

• Dairy farmers who are not pouring milk to APCOS regularly

• Farmers who are not interested to cooperate with the study.

3.10 Sources of Data

*Primary and Secondary data* were collected and used in the study. The sources of primary data were APCOS and dairy farmers who are supplying milk to APCOS. The direct sources of Secondary data were the annual reports and audited financial statements of APCOS, Regional Producers’ Unions, and KCMMF. Secondary data were also availed form the Economic Reviews of State Planning Board and Publications of Dairy Development and Animal Husbandry Departments of GOK and NDDB. The websites of the Departments and Agencies related to dairy sector were also accessed to collect secondary data.

3.11 Tools of Data Collection

The tools for collecting the *Primary Data* for the present study were prepared on the basis of inputs from related literature and insights from experts and other people who are working in the dairy sector. The tools used in this study are *interview schedule* constructed by the researcher and *standardized as well as adopted scales* from the related studies.

The scales used in the study are 1. Socio-Economic status of the family 2. Level of success in household dairy farming 3. Knowledge/Awareness of farmers about
Section I

This section consists of two parts. First part, an interview schedule with questions related to the socio-economic profile of the respondents such as age, gender, marital status, education, economic status, religion, caste, level of education and membership in political parties, co-operatives and financial institutions, exposure to Information and Communication Technology (ICT), Training in Co-operation and Dairying, Membership positions in dairy society, land holding and family profile and family income (30 items, Questions from A1 to A30, Ref to Appendix).

The second part is a standardized scale used to measure the Socio-Economic Status (SES) of the family of the respondents (22 items, Questions from A31a to A31v, Ref to Appendix). The scale consisted of 22 individual items related to the socio-economic aspects of a family, developed by O.P Aggarwal and team.(Aggarwal, Bhasin, Sharma, Chhabra, Aggarwal, & Rajoura, 2005). The alpha reliability of the scale was found to be 0.66(Cronbach's Alpha =0.66) and intrinsic validity was estimated for the scale as 0.813. The authors have affirmed that scale was validated against the widely used Kuppaswami’s modified scale of urban population. The scale consisted of 22 items and suitable weightage was given to each item and scoring for each item was based on a
scale ranging from 3 to 9. The maximum aggregate score was 100 and minimum was five. Based on the final score the socio-economic status of the family was divided into six socio-economic categories, namely Upper High (combined score of more than 76), High (61-75), Upper Middle (46-60), Lower Middle (31-45), Poor (16-30) and Very Poor (combined score less than 15). This instrument was used to assess the socio-economic status of dairy farmers in the present study.

Section II

The first part of this section is an interview schedule consisting of questions in relation to the various aspects of dairy farming, namely, Cattle owned by dairy farmers, Economics of dairy farming (quantity of milk production, cost of production, income, loan and grant schemes, etc.), Supportive factors of dairy farming (labour, family support, financial linkages etc.,) and operational problems experienced by farmers in dairying. (60 items, Questions from B1 to B60, Ref to Appendix).

The second part of this section is a scale used to measure the level of success in household dairy farming with ten indicators (10 items, Questions from B59a to B59j, Ref to Appendix). It was an arbitrary two point rating scale (Kothari, 2004) designed and tested by Dr. D. Shinekumar (Shinekumar, 2009). The alpha reliability of the scale was found to be 0.803 (Cronbach's Alpha = 0.803) and intrinsic validity was estimated for the scale as 0.896.

The ten indicators were developed from the various aspects of scientific dairy farming viz., use of locally available green fodder, monitoring of animal health, value addition for milk, utilization of government projects, training in dairy farming, local sale of milk etc.
Section III
An arbitrary two point rating scale adopted from Dr.D.Shinekumar (Shinekumar, 2009) was used to assess the knowledge/awareness of dairy farmers regarding the policies and programmes in the dairy sector. (11 items, Questions C1 to C11 Ref to Appendix) The alpha reliability of the scale was found to be 0.665 (Cronbach's Alpha =0.665) and intrinsic validity was estimated for the scale as 0.815.

Section IV
This section consisted of two scales to measure the perception of co-operation and commitment of the dairy farmers towards the village milk co-operative. The first scale used to measure perception of members regarding dairy co-operative organization was adopted from the instrument designed by Tushaar Shah (Shah, 1995). The components of co-operative organization namely, co-operative identity, values, principles, and functions of co-operative board are the dimensions used in the scale to capture the perception regarding of dairy farmers about co-operation. (17 items Questions D1 to D17 Ref to Appendix) The alpha reliability of the scale was found to be 0.717 (Cronbach's Alpha =0.717) and intrinsic validity was estimated for the scale as 0.847.

The second scale used in this section was a standardized scale developed by Upinder Dhar and team to measure organizational commitment of members in an organization. (Dhar, Prashant, & Srivastava, 2001) The scale was used to assess the commitment of farmers towards the dairy co-operative society (8 items Questions E1 to E8 Ref to Appendix). The alpha reliability and intrinsic validity of the scale were found to be 0.6078 and 0.7796 respectively.
Section V
The extent of participation of the dairy farmers in dairy co-operative society and in the development activities of the village was assessed by using a scale on participation adopted with slight modifications from Narayananana Swamy and team (Narayanaswamy, Samanta, & Gowda, 2007) (21 items, Questions F1 to F21 Ref to Appendix) The alpha reliability of the scale was found to be 0.797 (Cronbach’s Alpha =0.797) and intrinsic validity was estimated for the scale as 0.892.

Section VI
To assess the effectiveness of leadership exercised by the presidents on the functioning of the village milk co-operatives, a standardized scale developed by Haseen Taj (Taj, 2001). The dimensions of leadership captured through the scale are 1.Interpersonal Relations 2.Intellectual Operations 3.Behavioural and Emotional Stability 4.Ethical and Moral Strength 5.Adequacy of Communications 6.Operation as Citizen. (79 items, Questions G1 to G79 Ref to Appendix). The alpha reliability and intrinsic validity of the scale were found to be 0.78 and 0.88 respectively.

Section VII
The utilization of existing support services and linkages of the dairy sector and the training needs by the dairy farmers are assessed in this section using an interview schedule (8 items Questions H1 to H8, Ref to Appendix)

Section VIII
The data regarding the 36 Village Milk Co-operative Societies are collected with a help of an interview schedule under this section. (34 items Questions i1 to i34, Ref to Appendix).
<table>
<thead>
<tr>
<th>No.</th>
<th>Scale</th>
<th>No of questions</th>
<th>Min. Score</th>
<th>Max. Score</th>
<th>Alpha reliability</th>
<th>Intrinsic Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Socio-Economic Status</td>
<td>22</td>
<td>5</td>
<td>100</td>
<td>0.660</td>
<td>0.813</td>
</tr>
<tr>
<td>2</td>
<td>Level of success in household dairy farming</td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>0.803</td>
<td>0.896</td>
</tr>
<tr>
<td>3</td>
<td>Knowledge/awareness of farmers about polices, programmes in dairy sector</td>
<td>11</td>
<td>0</td>
<td>11</td>
<td>0.665</td>
<td>0.815</td>
</tr>
<tr>
<td>4</td>
<td>Perception on Co-operation</td>
<td>17</td>
<td>17</td>
<td>85</td>
<td>0.717</td>
<td>0.847</td>
</tr>
<tr>
<td>5</td>
<td>Commitment of members towards dairy co-operatives</td>
<td>8</td>
<td>8</td>
<td>40</td>
<td>0.607</td>
<td>0.779</td>
</tr>
<tr>
<td>6</td>
<td>Participation of farmers in dairy co-operative society/community</td>
<td>21</td>
<td>0</td>
<td>21</td>
<td>0.797</td>
<td>0.892</td>
</tr>
<tr>
<td>7</td>
<td>Leadership effectiveness of the presidents of APCOS</td>
<td>79</td>
<td>79</td>
<td>395</td>
<td>0.780</td>
<td>0.883</td>
</tr>
</tbody>
</table>

Normalization of Scores

*To make the components comparable all the scores are converted in to a standardized score with mean =100 and standard deviation =10 using the formula for normalization of scores then the scores <95 = low, 95-105 = medium and >105= high*

\[ Z = 100 + 10 \left( \frac{X - \text{mean}(X)}{\text{SD}(X)} \right) \]

3.12 Pretest

The researcher administered the tools of data collection on ten dairy farmers and on one APCOS in Trivandrum district to pretest the tools. Based on the nature of data collected, a few questions were reframed to make them more appropriate to the context of the study.
3.13 Data Collection

The primary data for the study were collected from the selected dairy farmers and from APCOS using the interview schedules and scales. The 360 selected farmers were interviewed in their households and the secretary/presidents of APCOS were interviewed to get data regarding APCOS. The primary data collection work took a period of six months from July 2010 to December 2010. The secondary data from APCOS and KCMMF were also collected simultaneously during the same period.

3.14 Analysis and Interpretation

The primary and secondary data collected for the study were quantified, categorized and tabulated. The data analysis was done using the Statistical Package for Social Sciences, Version 12.0(SPSS 12.0). Frequency Tables and Pie and bar diagrams were used to present the data. Descriptive statistics of mean, standard deviation, percentage analysis and inferential statistics such as Chi square test, t-test, Karl Pearson’s Correlation coefficient, one way ANOVA, Friedman test of equality of means and Binomial test of Proportion were used in the analysis of data.

3.15 Limitations of the Study

- The study was conducted among dairy farmers of APCOS only; the traditional diary co-operatives (Non APCOS) could not be included in this study.
- Majority of dairy farmers had not maintained any records regarding the income and expenses of dairy farming. Hence, data collected regarding the economic aspects of dairying are approximations.
• Five year data about APCOS were collected for a comparative analysis where for a few APCOS, all five year data were not available

3.16 Ethical Considerations

The researcher had obtained the necessary permission from the Dept. of Dairy Development for conducting the study since the dairy co-operatives are under its administrative control. The respondents were informed about the purpose of the study and their consent was assured before data collection.

3.17 Chapter Scheme

The study report is presented in five Chapters

The first chapter deals with the introduction of the topic under study. The second chapter presents the conceptual framework of the study, review of the development of dairy co-operatives and the related studies in dairy co-operatives in India. The third chapter consists of the methodology used for the study. Analysis of data and interpretations are presented in the fourth chapter. The fifth chapter provides the major findings, recommendations and scope for further research.