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. Approximately 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 Operational Flood (OF) Programme commonly known as ‘White Revolution’ was instrumental for enhancing the milk production in the country. The importance of Operational 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 OF programme was modelled on the Anand Pattern Dairy Cooperatives, referring to their origin in Anand District in the state of Gujarat. This was comprised of a three tier system with village level dairy cooperative 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 OF programme with decentralized milk production by small milk producers, milk procurement by primary dairy cooperatives of milk producers, centralized milk processing by union of dairy cooperatives 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 dairy business starting from production to marketing. A good number of evaluation studies of Operational Flood project have commented that Dairy cooperative 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 cooperatives have created the necessary infrastructure and marketing networks for dairy farming in the country.

Kerala Cooperative 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 Cooperative system. At present the MILMA federation consists of 8.31 lakhs dairy farmers of 2678 village level primary milk cooperatives organized under three Regional Milk Producers Unions. During the OF period(1980-96), MILMA provided leadership in all aspects of dairy development in the state viz., formation of village level dairy cooperatives, 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 Operational 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 health 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 (cooperatives, 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 governmental 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 cooperatives in Kerala in the post OF period is significant. Here, an attempt has been made to analyze the multiple aspects of village dairy cooperatives to identity the problems and prospects of diary sector in Kerala.

2. Objectives of the Study

   General Objective

   To understand the present scenario of the village milk cooperatives in Kerala with special reference to the Anand Pattern Cooperative 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 cooperatives
   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 cooperatives about the concept of cooperation—cooperative identity, values, principles and their commitment to the village milk cooperatives
5. To examine the extent of participation of the dairy farmers in the activities of the village milk cooperatives 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 cooperatives
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 cooperatives
9. To recommend appropriate measures/action programmes for the effective functioning of the village milk cooperatives

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 cooperation and commitment to organization among the members of dairy cooperative society
4. There is significant relationship between membership positions in dairy cooperative society and level of participation of members in programmes of dairy cooperative and local community
5. There are significant correlations between the perception of cooperation, commitment, awareness, participation and leadership effectiveness of the Presidents of dairy cooperatives

4. Definition of Major Concepts

4.1 Village Milk Cooperatives
In the present study, *village milk cooperatives* refer to the Dairy Cooperative Society (DCS) functioning at the village level for the dairy farmers. The DCS in the context of Kerala is also known as Anand Pattern Cooperative Society (APCOS).

**4.2 Co-operation**

"Cooperation 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). 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 cooperative society.

**4.3 Co-operative**

“Cooperative 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 Cooperative Alliance (ICA), 1995). The *cooperative* in the present study is understood as village level milk cooperative society.

**4.4 Community Assets**

*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 cooperative organization.

**4.5 Dairy Farmer**

Dairy farmer refers to the person who rear 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.

**5. 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 Cooperatives across the three regions of Kerala Cooperative Milk Marketing Federation (KCMMF). The study also tried to find out the correlation that exists between the perception of dairy farmers on cooperation and their commitment to the dairy cooperative society and the relationship between the membership position in dairy cooperatives and members’ level of participation in the programmes of the Village milk Cooperatives and the Local Community.

6. Universe/Population

Population

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

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

7. Unit of Analysis

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

8. Sampling Procedure and Sample size

Multi stage random sampling was used in the selection of Village Milk Cooperatives and purposive sampling was used in the selection of dairy farmers. The sample size of the study comprises of 36 village milk cooperatives and 360 dairy farmers

9 Tools of Data Collection

The tools used in this study are interview schedule constructed by the researcher and standardized as well as adopted scales from the related studies.

10 Data Collection

The primary data for the study were collected from the selected dairy farmers and from Village Milk Cooperatives using the interview schedules and scales. The 360
selected farmers were interviewed in their households and the secretary/presidents were interviewed to get data regarding Village Milk Cooperatives.

11 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.

12 Limitations of the study

- The study was conducted among dairy farmers of APCOS only; the traditional diary cooperatives (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.

13 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 frame work of the study, review of the development of dairy cooperatives and the related studies in dairy cooperatives 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.

14. Major Findings of the Study

The major findings of the study are scripted under the following headings. 1. Socio-Economic profile of the Dairy Farmers, 2. Dairy Farming and Allied Aspects and
constraints experienced by farmers in Dairying, 3. Awareness of Dairy Farmers about the policies and programmes in Dairy Sector, 4. Perception of Dairy farmers about Cooperation and their Commitment to dairy cooperative society, 5. Participation of dairy farmers in the activities of APCOS and in the development activities of the village, 6. The effectiveness of leadership of the presidents of APCOS, 7. Support services and linkages of dairy sector, 8. Community assets of APCOS.

14.1 Socio-Economic Profile of the Dairy Farmers

- Majority of the dairy farmers (71.1%) are in the middle age group of 36-60 years and the percentage of young dairy farmers (20-35 years) in the sample are very low (5.8%), which indicates that younger generation is not taking up dairy farming as a preferred occupation.

- Most of the dairy farmers (70.28%) are males. The female dairy farmers constitute only 29.72% of the sample. The women membership in the dairy cooperatives in the sample is lower than the expected goal of NDDB having 50% women membership in dairy cooperatives.

- Majority of the Dairy Farmers (92.77%) are illiterate as far as computer and internet are concerned. This indicates that the programmes of ICT for people are not reaching the grass root as expected.

- The cooperative movement demands that the members should have continuous education on cooperative values and principles to safeguard the goal of cooperation but majority (80.28%) of the dairy farmers have no training in cooperation.

- The dairy farmers have got an average 12.60 years of association with APCOS, depicts that they have sufficient years of experience in dairy sector.

- Regarding training in dairying, 68.6% of the respondents have training in dairy farming by way of attending seminars and training classes organized by the Dairy Development, Animal Husbandry Departments of Gov. of Kerala and APCOS and other agencies in the sector. But 31.4% of the respondents did not have any formal training in dairy farming and they undertake the dairying activity based on the traditional and local experience which they have acquired over the time.

The Family Profile

- The family Profile of the respondents follows a more or less similar population characteristic of the State of Kerala. The average family size is 4.3 which depict the
typical small family norm of the State and 60.55% of the members in the households depend on the Head of the family for their survival.

- Majority of the households have access to the basic necessities of life. 98.89% of the families live in their owned houses, 100% have access to drinking water, 97.5% are having electricity and toilets etc., indicate that the dairy farmers possess basic amenities of life.
- Most (68%) of the dairy farmers are marginal farmers with land less than one hectare, only 13.9% have land above one hectare and about 18.1% of have no agriculture land. The average agriculture land of the sample is 129.18 cents
- Monthly income of the family from all sources is estimated as Rs.10778.91 and yearly per capita income is Rs. 32016.52 which is lower than the national per capita income at current price which is Rs.46492/.
- Majority of the dairy farmers (76.9%) belong to the APL section and only 23.1% are from the BPL section as per the Government's certification.
- As per the scale used to measure the socio-economic status of the families of the respondents it is found that 1.4% are poor, 56.9% are from lower middle class, 39.4% are from upper middle class and 2.2% are from higher class.

14.2 Dairy Farming and Allied Aspects

Cattles owned by dairy farmers

- On an average 2-3 (mean = 2.3) milch cows are kept by dairy farmers and Jersey and Holstein Friesians (HF) are the commonly found cross breed animals with the dairy farmers in Kerala. Majority of the dairy farmers are small and marginal farmers with a small numbers of cattle asset. Farmers who have one or two cows in milk comprise 77.22% of the sample. Only 2.5% of the sample is medium type dairy farmers with 11-50 cows in milk.
- The average milk production per cow for the commonly reared crossbreed variety, Jersey and HF are found to be 9.04 and 9.84 liters/day respectively.
- A few dairy farmers are still maintaining good quality local breeds for domestic purposes and the average yield per local breed cow is found to be 6.35 liters per day. Low maintenance cost of local cows, better level of disease resistance, recent findings regarding the superior quality of milk of local breeds, etc., are some of the reasons for renewed interest in protection of local breeds.
Economics of Dairy Farming

- The mean value of the asset of dairy units is Rs91, 261/- (S.D= 1.71 lacs) and a good number (35%) are having dairy unit worth Rs.25, 000/- to Rs.50, 000/-. 
- The average milk production in households per day in lean and flush seasons are 20.79 liters and 22.35 liters respectively and statistically significant difference is observed in the production of milk between lean and flush seasons. 
- The average household consumption per day in lean and flush seasons is 1.39 liters and 1.43 liters respectively. It is observed that the average family size of the sample is 4.3. Hence, the average per capita consumption of milk/milk products in the households of dairy farmers is estimated as 0.325 liters (334gm/day) which is much above the state per capita consumption of 232gms of milk per day and the Indian Council for Medical Research (ICMR)’s recommendation of per capita 280 grams of milk per day for a healthy diet. The data indicated that the dairy farming has got positive impact on health promotion in the villages. 
- Significant difference is found between the actual milk production and expected milk production by the cows owned by the dairy farmers. The average actual milk production per day is 8.88 liters and the average expected milk production is 12.16 liters. *Dairy farmers have raised the apprehension that the milk production of the crossbreed cows is getting diminished over the productive years due to prevailing illness and changing climatic conditions which is substantiated with the above results. Even in the second or third lactation where normally an increase in yield is expected, the farmers’ experience show that the actual yield is less than the expected yield.* 
- Only 11.4% of the dairy farmers have biogas plant attached to their dairy unit. Even though the Agriculture department and various NGOs are promoting the use of biogas as a renewable energy, it was not effectively implemented among the dairy farmers. 
- Most of the farmers (74.2%) do not know the unit cost of production indicating the lack of awareness among the dairy farmers regarding the basic financial skills required for successful dairy management. 

The Supportive factors of dairy farming

- Most (79.16%) of the farmers are doing all the work of their dairy unit by themselves and 18.06% have employed only one part time worker that too only
for milking the cows daily in the morning and in the evening. About 10 farmers (2.78%) who are having mini dairy units have employed 2-5 workers to assist in the dairy related work.

- Only a few farmers (2.2%) have the proper practice of keeping the records and accounts of dairy unit. Regarding the knowledge about cost of milk production only 25.8% have the awareness regarding the unit production cost. Any field level estimate of cost of production in dairy farming is rather a rough estimate since very few farmers keep the actual records and make objective calculation about the cost involved in dairy activity.

*Strategies adopted by the dairy farmers for profitable dairy farming*

- 30.6% of the dairy farmers are found to be successful in dairy farming based on the assessment made using the scale to measure the level of success in household dairy farming.

*Testing of Hypothesis 1*

Independent sample T-test shows that there is significant difference between farmers who have received training in dairy farming and farmers who have not received training in dairy farming, in their level of success in dairying (p-value<0.01, at 1% level of significance). The farmers with training (mean= 101.49) had scored more on success factors than other farmers without training (mean=96.85). Hence the proposed hypothesis - There is significant difference between farmers with and without training in dairy farming in their mean scores of success factors adopted in dairy farming – is accepted.

- The analysis of variance shows that there is significant difference in between central and other two regions regarding mean score of success factors in dairy farming. The farmers in the central region are found to be adopting the strategies in dairy management more in comparison to the farmers of northern and southern regions.

*Constraints/Problems experienced by Farmers in Dairying*

- Even though farmers have to face many constraints in dairy farming, majority(64.2%) of the farmers like to continue in the same mode but 16.7% are planning to limit the dairy farming to household requirements and about 12.8% are about to quit the activity and only 6.4% wanted to expand the dairy farming.
• The problems of dairy sector which are ranked as very crucial by the farmers are increase in the cost of cattle feed, non competitive price for the milk supplied, and lack of government support for the farmers. Majority of the farmers have the opinion that the two major issues affecting the sector are the increasing cost of cattle feed (81.7%) and the low procurement price of milk (71.1%).

14.3 Knowledge/ Awareness of Dairy Farmers about the Policies and Programmes in Dairy Sector

• The knowledge/awareness regarding the policies of dairy sector is found to be very low among the dairy farmers including the governing body members of APCOS. Only a small percentage (3- 6%) of the farmers are aware about the same.

• Majority (80-95%) of the farmers have knowledge/awareness regarding the Schemes and Programmes. Farmers are well aware of the projects which are directly beneficial to them which are implemented through Animal Husbandry and Dairy Development Departments of the Government. 41.67% are having high level of awareness about the programmes of dairy sector.

• Testing of Hypothesis II

Independent sample t-test shows that there is significant difference between Members and Non-Members in their level of knowledge/awareness of programmes of dairy sector (p-value<0.05, at 1% level of significance) the members have got an average level of awareness (mean=100.435) and non-members have only a low level of awareness (mean=94.837) about the programmes of dairy sector. Hence, the stated Hypothesis - There is significant difference between member dairy farmers and non-member dairy farmers in their level of awareness regarding programmes in dairy sector- is accepted.

The members have more interaction with APCOS hence they are better informed about the programmes and policies in dairy sector. Active membership often facilitates better awareness about the programmes in the dairy sector.

14.4 Perception of Dairy Farmers about Cooperation and their Commitment to Dairy Cooperative Society
• 35% of the farmers are having low level of perception regarding cooperation, 33.7% and 31.4% respectively have average and above average level of perception regarding the cooperation

• 26.5% of the farmers have low level of commitment, 47.0% have average level of commitment and 26.5% exhibit high level of commitment to their dairy cooperative society.

• Testing of Hypothesis III
  A positive correlation \( r=0.347, \) sig = 0.000, at 1% level of significance) is found between the perception of farmers about cooperation and their commitment to their organization. Hence, the proposed hypothesis- There is a positive correlation between the perception on cooperation and commitment to organization among the members of dairy cooperative society- is accepted.

APCOS being a member controlled, democratic organization, the members’ commitment is very crucial for its success. A right perception regarding the values and principles and internalization of these values and principles would results in enhanced commitment and consequently the success of the organization. It is observed that only 31.4% and 26.5% of the farmers are having above average perception regarding cooperation and commitment to the dairy society respectively. The farmers’ perception regarding the foundations of their organization needs to be strengthened to enhance their commitment to achieve the socio-economic objectives of the organization.

14.5 Participation of dairy Farmers in the activities of APCOS and in the Development Activities of the Village

• Majority (79-84%) of the member farmers have participated in the Annual General Body Meeting, other special meetings organized occasionally to discuss the critical issues affecting farmers and farmers are very much concerned about the low income from dairy farming due the unsolved issues of the sector.

• A small percentage(3-10%) of Dairy farmers are found to be getting involved in the common micro level organizations, welfare programs in the village and taking leadership roles in community activities.

• About 56% of the members have participated in the gramasabha and about 41% are able to raise the problems of dairy farmers in the gramasabha discussions.
• Members participating in APCOS' own programmes are also found to be very low (17-25%) which implies that the cooperative ideal of concern for community through welfare activities in the village is not taking place effectively through APCOS in the village.

• Only 22.3% of the dairy farmers have shown higher level of participation both issues related to community’s concerns and in the activities of APCOS.

• Dairy farmers have recorded an average level of participation in the activities of APCOS and in the programmes of the local community.

• **Testing of Hypothesis IV**
  The one way ANOVA indicates that there is significant difference in the level of participation in dairy society as well as the local community activities among the dairy farmers belonging to different membership positions in APCOS (p-value <0.05 at 5% level of significance). The Presidents are having higher level of participation (mean=113.27) followed by Governing Board members (mean=104.15) and the ordinary members (mean=96.94) have only lower level of participation in the activities of APCOS and the local community. Hence, the stated hypothesis - *There is significant relationship between membership positions in dairy cooperative society and level of participation of members in programmes of dairy cooperative and local community – is accepted.*

  Leadership positions in grass root organizations are avenues for members to get involved in the local issues and concerns of the people. Women and BPL members and members with low level of education are to be encouraged to take up leadership roles in APCOS after equipping them by way of training and capacity building programmes. The leadership positions are opportunities for them to get involved in community development activities of the village.

14.6 **The effectiveness of leadership of the Presidents of APCOS**

• 100% of the Presidents of APCOS are males and belonging to APL and majority (77.8%) of them are in the age group of 36-60 years and there is almost equal representation from forward (47.2%) and backward classes (52.8%) with a slight majority for backward class. But no representation is found from SC/ST communities.
• Regarding the priority of dairy farming only 8.3 % have dairy farming as major occupation and vast majority (91.7%) are having dairying as only a subsidiary occupation.

• As far as the association and experience with APCOS, it is found that most of them have(63.9%) come to the sector during the Operation Flood Period(1980-1996) in Kerala and about 27.8% have joined the sector in the post Operation Flood period(1997-2010) who are the new generation dairy farmers who have entered the sector and reached to the leadership of APCOS.

• About 50% of the Presidents have continued in the position for less than 10 years but about 41.7% have occupied the post of president for the last 10-20 years and 8.3% of them have held it for more than 20 years continuously. 50% of the presidents are having more than 10 years of tenure as leaders of APCOS.

• 91.7% and 47.2% of the presidents have training in dairy farming and training in cooperation respectively.

• Majority of the presidents are having a high level of perception regarding cooperation (69.4%), commitment to the organization (61.1%), awareness on programmes in dairy sector (75%), participation in programmes of APCOS and the local community (77.8%). The presidents being the leaders of the cooperative society are getting involved in the manifold activities of APCOS.

• Only 38.9% of the Presidents are highly effective in their leadership roles. 30.6% of the Presidents are found to be average and another 30.6% are found to be below average in their leadership roles. The leadership effectiveness scores of the Presidents in all regions are average (mean score in between 95-105). The members of APCOS have perceived that the effectiveness the leadership of the APCOS Presidents’ is average.

• **Testing of Hypothesis - V**
  There are no significant positive correlations, found between the perception of cooperation, commitment, awareness of programmes of dairy sector, participation in APCOS / local community and the leadership effectiveness of Presidents. Hence, the stated hypothesis - *There are significant correlations between the perception of cooperation, commitment, awareness, participation and leadership effectiveness of the Presidents of dairy cooperatives* - is **rejected**.
The mean scores of Presidents on various aspects of cooperation are above average. In spite of above average knowledge in cooperation, commitment, awareness of policies and programmes in dairy sector, and participation in local community as well as in APCOS the Presidents are not able to become effective in leading their organizations to its socio-economic objectives.

14.7 Support Services and Linkages of Dairy Sector

- Most (96.7%) of the farmers are having continuous contact with doctors of the veterinary hospitals under the Animal Husbandry Department. Of these 49% consider that the contact is of having high value. Veterinary service is a key factor for successful dairy farming and dairy farmers are well aware of the importance of veterinary services in dairy farming.
- Only 32.5% of the farmers have contact with the extn. Staff of dairy development department even though the Dairy Development Department of GOK is entrusted with responsibility of the promotion of dairy farming in the State including the formation as well as administrative control of APCOSs in the State. The department is having its office in each development block and dairy extension staffs are working in each block and they are expected to interact with dairy farmers. Similarly only 26.4% have contact with field staff of MILMA union.
- A good number (71.4%) of the farmers are maintaining contact with LSG and 48.6% are having linkages with local banks.
- Only very few dairy farmers (less than 2%) have contact with educational institutions (university/colleges) of the locality and farmers’ contact with local NGOs are also very minimal (4.4%).
- Kissan toll free number (1800 180 1551) from where farmers can access reliable information regarding farming is very minimally (1.9%) utilized by the dairy farmers.
- Microcredit programmes are operational among the farmers but the usages of such financial services are also very low among the dairy farmers (16.1%).

The training needs assessment of dairy farmers

- Majority(84.2%)of the dairy farmers have reported that they require training regarding diseases affecting the animals which is a major problem of dairy farming and 35% of them have given top priority to this topic.
• A major constraint in dairy farming is the escalating cost of cattle feed and non-availability of green fodder. Farmers are interested to learn techniques for local production of cattle feed. 67.8% of the farmers want to learn the local production of cattle feed and 29% of them considered that the training requirement is very high. 37.8% of demand training in fodder cultivation and preservation.

• Most (76-79%) of the farmers have considered half day seminar and one day seminars are moderately useful and about 16-18% have rated them as highly useful.

• A few farmers have the view that Short-term training programmes, Radio and Television programmes, Newspaper and Magazines and exhibitions are also effective in information dissemination among dairy farmers.

*Dairy farmers’ preference regarding the mode of training in future*

• Half day /one day seminars are the preferred option for majority of the farmers. 55-56% has expressed moderate interest in half/one day seminars and 21.7% expressed their high level of interest in half day training. Most of the dairy farmers are marginal farmers who are engaged in dairy related work all through the day and they could spare only a few hours in a day for any kind of programmes so half day training is the most suitable option to ensure participation of dairy farmers.

• Majority (78%) of farmers are interested in on farm training. This is an indication that the extension departments and field staff of the agencies of dairy sector have to be with farmers to train them and solve their problems which they encounter in dairy farming. APCOS could better facilitate on farm training in an effective manner by utilizing its networks and resources.

*Effectiveness of Linkages in Dairy Sector*

• Most of the dairy farmers (76-98%) have considered the linkage with MILMA /Animal Husbandry /Dairy Development Dept/Krishibhavan/LSG are required and desirable because all these agencies are directly related to dairy farming.

• 85.5% affirm that they have no linkage with Agriculture University and its programmes but about 52% of the dairy farmers have the view that linkage with Agriculture University is desirable for dairy farmers and APCOS.

• Majority (84.7%) is not linked to the community based credit systems but 49.2% have the opinion that linkages with microfinance institutions are required.
• Most (99-100%) of the Dairy farmers have perceived that they or their organization (APCOS) have no linkage with nearby educational institutions/local NGOs/Social work institutes /national or international agencies promoting livelihood programmes. A small group (12-18%) has the opinion that such linkages are useful for APCOS and dairy farmers.

14.8 Community Assets of APCOS

The various community assets- resources and facilities created by APCOS’ in the villages for a successful operation of dairy related activities are summarized in this section. The village milk societies have organized the marginal farmers and created the necessary infrastructural and marketing networks so that anybody in the village can start a dairy unit and take membership in the dairy society and sell the milk to the dairy society as well as utilize various benefits from the programmes of diary sector for enhancing ones income.

• Average no. of members in a milk society is found to be 395(Min=16 Max=835) with 77.64% male and 22.36% female membership. “Perspective2010” was a strategic plan of NDDB to meet the challenges of dairy industry and one of the targets was increasing women membership in dairy cooperatives to 50% and improving women participation in the governance of dairy cooperatives at all level. Women membership is only around 25% in Kerala far below the expectation of NDDB.

Average No of farmers pouring milk in the Milk Society

• Only 25.85% of the members are active farmers who are supplying milk to the society. The rest 74.15% members are there on the membership roll but not supplying milk to the society. This dormant membership indicates that farmers have withdrawn from the dairy farming activity due to various reasons and among the milk pouring members 25.45% are women and among pouring non members 35.63% are women.

Local consumers

The Friedman test of equality of mean for related samples shows that there is significant variation in number of consumers (p-value. <0.01 at 1% level of significance) There is an increase in the mean number of local consumers of the milk societies. The people depending on the local dairy society to purchase milk has
increased over the years from 2005-06 to 2009-10. The average no. of consumers for the period 2009-10 was 89(S.D =70 Min= 22 & Max = 295).

**Assets of APCOS**

- Majority(63.9%) of the APCOS have owned land varying from 5 to 10 cents and 16.7% of APCOS have more than 10 cents of land and 19.4 % of APCOS have not possessed any land. The average size of land owned by APCOS during the period (2005-2010) is 8.10 cent to 8.23 cents. The mean value of land during the same period (2005-2010) has increased from Rs.2.54 lacs in 2005-06 to Rs.6.24 lacs in 2009-10 with an increase of 145% approximately.

**Total Asset of APCOS**

Friedman test of equality of mean for related sample is used to compare the total asset owned by APCOS for the period 2005-06 to 2009-10. Test shows that there is significant variation in the total asset of APCOS for the stated period (p-value < 0.01, at 1% level of significance). There is an increase in the total asset of APCOS over the period.

For the year 2009-10 the mean assets value is Rs. 23.81 lacs (S.D = Rs 28.43 lacs, Min = Rs 10269 &Max = Rs.114 lacs). The facilities created by APCOS are beneficial for the whole community and this is a group asset which is having clear community linkages. Total no of APCOS now functioning as on 31.3.2010 (Annual Report 2009-10, Milma) are about 2678. The average asset of an APCOS of the sample in 2009-10 is Rs 23.81 lacs. As far as all the existing APCOS in Kerala are concerned they have together created total assets of Rs 637.73 cores approximately. This large network of facilities spread across the rural villages of Kerala is the result of the hard work of small and marginal dairy farmers for last thirty years.

- But in all the years, the ANOVA shows that there is no significant difference in total assets owned by the APCOS in the three regions under MILMA. The assets formed in the dairy cooperative net work in Kerala are spread all over the state and no major variation is noticed among the three Regions. The APCOS’ have been established in almost all villages in Kerala where there are opportunities for dairy farming.

**Business Turn Over and Profit of APCOS**

- The average turnover of APCOS in the period varies over the years. In the year 2005-06 the mean turnover was RS 67.03 lacs and in the year 2006-07 it was
Rs.66.03 lacs and in the year 2007-08 it was Rs 71.89 lacs and the from the available data of the years 2008-10, it was only Rs.40.55lacs and Rs.42.92 lacs respectively. There is very high variation in the turnover of APCOS basically due to the difference in the volume of milk handled by them. Maximum turnover was noticed in the years 2006-08 with Rs 7.01 cores of business was handled by a few APCOS.

- Majority of the APCOS are making profit and it is shared among the member farmers as per the existing norms of APCOS. The Average Profit generated varies over the period. For the last three years (2007-10) the average profit of APCOS was between Rs 1.6 lacs to Rs 1.8 lacs i.e., the APCOS are generating only very marginal profit. The percentage of profit in the years (2007-10) was 2.5%, 4.31% &3.73% respectively and the average profit generated in the period (2007-10) was only 3.51%.

**Dairy Farmers’ views about the Merits of APCOS**

- The most important merit of APCOS as perceived by the dairy farmers (N=360) was that the APCOS has created *a good infrastructure facilities for milk procurement from dairy farmers in the villages in Kerala*. The other important merits of APCOS perceived by the farmers are: it is a good platform for people to come together and the APCOS could easily organize the farmers in the villages.

**Problems encountered by APCOS**

- The Major problems encountered by APCOS as per the opinion of the presidents/secretaries are, the increasing cost of milk production, low return for farmers, Lack of coordination of departments in dairy sector, political overtones, lack of modernization of APCOS, ineffective schemes and labour shortage. The government fixing the price of milk in the market without considering the real production cost of milk is adversely affecting the dairy farmers and APCOS.

15. **Recommendations**

The following recommendations are made, based on the major findings of the study, suggestions put forth by the experienced dairy farmers, staff of APCOS and field level observation of the researcher.

1. The percentage of youth (age group of 20-35) engaged in dairy farming in the sample is found to be very low (5.8%) depicting the general trend of youth opting out from
agriculture and allied sectors. The dairy cooperatives and Depts. of the Government related to dairy development have to plan programmes to attract youth towards dairy farming and dairy based enterprises.

2. The women membership in the dairy cooperatives in the sample is only 29.72% which is much below the expected goal of NDDB having 50% women membership in dairy cooperatives. The NGOs, LSGs, and other Govt. departments having programmes in women empowerment have to promote dairy farming as a livelihood and business enterprise among rural women and encourage them to become active members in village milk cooperatives because participation in member based organizations are pathways for socio-economic and political empowerment.

3. The lower levels of education of dairy farmers with majority (92.77%) are computer illiterate brought out the gravity of digital divide in the rural areas of Kerala. This has indicated that the governmental project of e-literacy has not reached the grass root as expected. The infrastructure facilities created by the APCOS could be used as an information/training centre for dairy farmers as well as for the people of the village. The APCOS’s centre can effectively function as a non formal education centre for dairy farmers in educating them on topics of diary as well as other areas of interest like computer, internet and so on.

4. Even though majority of the dairy farmers have membership in cooperative organizations, most (80.28%) of them have not received any training in fundamentals aspects of cooperative movements. Since the cooperative movement demands that the members should have continuous education on cooperative identity, values and principles of cooperation to safeguard the foundations of the cooperative organizations, APCOS could organize training programmes in cooperation for the member farmers to strengthen its cooperative foundations. During the period 2007-08 to 2009-10 only a small percentage (1.9 %) of farmers have received training in cooperation organized by APCOS/MILMA. Dairy Cooperative organizations are not taking efforts to strengthen their cooperative basis thorough training and awareness programmes. The MILMA federation has to continuously conscientise their members through various training and awareness generation programmes to strengthen cooperative foundations of dairy organizations.

5. APCOS can create awareness among members regarding all banking services and establish 100 per cent bank linkages for their members and implement bank linked payment for dairy farmers for pouring milk in APCOS
6. Green fodder cultivation is an essential component for successful diary development but shortage of green fodder is reported due to the scarcity of land available for green fodder cultivation and the large majority of dairy farmers in the state comprises of marginal (68%) and landless farmers (18.1%). Government has to plan projects to increase the availability of green fodder by utilizing common lands for green fodder cultivation using the labour available under MGNREGS. To reduce the fodder Shortage, Self Help Groups, Farmers Clubs and APCOS can organize fodder and feed banks with support of Banks and LSGs.

7. Since most of the marginal farmers have experienced that features of cross breed jersey cows are more farmer friendly, the government should promote jersey breed cows among small and marginal farmers.

8. A renewed interest is seen among farmers to rear local breed cows on account of its low maintenance costs, disease resistance and quality of milk. The movements like organic farming and preservation of indigenous species have created awareness regarding the protection of local breeds. Hence, the breeding policy of the government has to reconsider the preservation, protection and promotion of local breed cows.

9. It is observed that the daily average milk production of cross bred cows in the sample is 8.88 liters much below the average expected milk production of 12.16 liters by the farmers which confirmed the apprehension of many farmers that the milk production of cross breed cow is getting diminished over the productive years due to the changing climatic conditions and higher morbidity of cross breed cows. This critical issue is to be scientifically investigated.

10. Since farmers are not able to realize even the production cost of milk, under the present system of governmental control of milk price in the market, APCOS and MILMA federation have to fight for their rights for autonomy in dairy sector so that reasonable profit may be guaranteed for small and marginal farmers who venture into dairy farming as their livelihood option.

11. Only 11.4% farmers have biogas plants attached to their dairy units. The use of biogas could reduce their energy expenditure for household purposes. Even though the Agriculture Department, LSGs and NGOs are promoting Biogas as a renewable energy, it was not effectively implemented among dairy farmers in spite of the opportunities among them. Agencies in dairy and allied sectors and NGOs have to promote the use of biogas among dairy farmers to help them to get additional saving by optimal use of cow dung.
12. The cow dung/biogas slurry could also be used to make vermi compost which could fetch additional income for the farmers but at present only 2.2 per cent of the farmers are utilizing the opportunity. Agencies involved in dairy sector could plan and implement projects for household vermi compost units for dairy farmers and provide training for the same.

13. The credit facility available for dairy farming is not viable with prevailing interest rate of 10-12 per cent but one the other hand the credit facilities are available at 3-5 % of interest for the agriculture farmers. The agencies working for the dairy development in the state have to negotiate with financial institutions as well as liaison with government for policy changes so that dairy farmers should be treated on par with agriculture farmers in all grants and subsidy schemes and credit facilities.

14. As majority(74.2 %) of the farmers are not aware about the unit cost of milk production APCOS has to organize frequent training programmes for dairy farmers in financial aspects of dairy management.

15. Since it is observed that only 2.2 per cent of the dairy farmers maintain farm registers, APCOS and other agencies in dairy sector can provide training in “Records maintenance” and incentives for farmers for keeping proper records of dairying activities so that scientific and reliable data regarding animals and real cost of dairying could be generated for dairy development programmes in the State. Besides such practices will enhance the dairy management skills of the farmers.

16. Even though family members are involved in the dairy farming activities, a male dominance is observed in the decisions regarding dairy farming at households. Enhancing the women membership in Dairy Cooperatives in turn may help the women to get more participation in the decisions making in dairy farming in household as well as in the activities of dairy cooperative society.

17. About 31.4 per cent of the farmers have not received any formal training in dairying but farmers with training (68.6 per cent) are found to be adopting various strategies for making dairying a profitable enterprise. Since significant difference is also observed in their level of success in dairying, continuous training programmes in various aspects of dairy farming could be planned by APCOS and other agencies in dairy sector for their member farmers.

18. Member farmers are found to be more aware of the programmes of dairy sector than non member farmers who supply milk to APCOS. Membership is an opportunity for farmers to become active in the village level organization which in turn promote better
awareness and subsequent utilization of various government schemes in the sector. 

**APCOS have to enlarge their membership base so that more people in the villages could be included the diary cooperative net work.**

19. Awareness about various programmes and services in the dairy sector are very crucial for making dairy farming a viable livelihood option for farmers. Dairy farming is a major livelihood option for small and marginal farmers whose education level is low consequently they have a low level of awareness regarding programmes and services of the sector which in turn would limit their opportunities in utilizing the programmes and services effectively. Hence, **APCOS has to organize special awareness and training programmes for dairy farmers whose major occupation is dairy farming. APCOS could better facilitate as a link agent for channelizing the schemes and services for the farmers.**

20. Dairy farmers’ perception on cooperation and their commitment to their organization are positively correlated but it is observed that only 31.4 percent and 26.5 per cent of the farmers are having above average perception regarding cooperation and above average commitment to the dairy society respectively. APCOS being a member controlled, democratic organization, the members’ commitment is very crucial for its success. A right perception regarding the values and principles and internalization of these values and principles would results in enhanced commitment and consequently the success of the organization. The farmers’ perception regarding the foundations of their organization needs to be strengthened to enhance their commitment to achieve the socio-economic objectives of the organization. **APCOS have to organize training programmes regarding the cooperative foundations of the dairy cooperatives to their members.**

21. Dairy farmers who are holding positions in the decision making bodies (Governing Board) of APCOS have shown better perception on cooperation and commitment to the dairy society. Hence, Women dairy farmers, farmers whose major occupation is dairy and farmers with low level of education, whose level of perception on cooperation is found to be low could be given opportunity to take up leadership positions in Governing Board of Diary Cooperatives to enhance their level of perception of cooperation and commitment to the organization for achieving the overall socio-economic objectives of dairy cooperative societies.

22. Significant relationship is found between membership positions in dairy cooperatives and participation in the programmes of dairy society and local community with
Governing Board members demonstrating higher level of participation than ordinary members. Besides the members with training have got higher level of participation since the training programmes are found to be effective in enhancing participation of members in the activities of APCOS and of the local community. The training results in better awareness creation and better participation in the programmes of APCOS and local community. Dairy farmers belonging to the sections of women, BPL and low educational background are to be encouraged to take up leadership roles in APCOS after equipping them by way of training and capacity building programmes. The leadership positions are opportunities for them to get involved in community development activities of the village.

23. The Presidents of APCOS are found to be not very effective in leading their organizations to the socio-economic objectives of the organizations in spite of having above average knowledge in cooperation, commitment, awareness of policies and programmes in dairy sector and participation in local community as well as in the affairs of APCOS. Since they have good commitment and rather clear perception about cooperative framework of their organizations, their effectiveness could be improved through capacity building through training. They need more scientific training in developing their skills in managing the organization effectively. Training in leadership and allied areas in cooperative dairy farming could help the presidents to enhance their leadership and become effective in their role as presidents of prouder organizations in the rural sector.

24. Even though the agencies in dairy sector namely MILMA, Dairy Development, Animal Husbandry and KLDB and a few NGOs organize short term training programmes for farmers, the training need assessment have revealed that farmers require more training in multiple aspects of dairy farming. The agencies have to organize training at village level under the coordination of APCOS so that better farmers’ participation could be facilitated under APCOS

25. APCOS have not established linkages with nearby educational institutions, local and national level NGOs, Social Work Institutions and National/International agencies promoting livelihood programmes. Most of the farmers are not aware about the advantages of such linkages. Networking, Partnership and Linkages are the development strategies applied in people based organizations to strengthen their capacities to meet the challenges they face in the realization of the objectives of the organizations. APCOS being a people based village level producer cooperative
organization has to utilize all available networks to strengthen their dairy related business to fetch maximum returns to their members who are small and marginal farmers. Dairy farmers look forward to APCOS as a source of support for building up a sustainable livelihood through dairy farming. Leadership of APCOS have to reflect over whether they are able to provide the adequate support for its members in finding dairy farming as a sustainable livelihood option. In this regard, the APCOS has to utilize all available and possible networks/linkages and partnerships for the larger interest of its members’ welfare. The linkages and networks with various governmental departments involved in dairy development with APCOS and MILMA are to be properly designed to facilitate the independent functioning of MILMA and APCOS so that the objectives of APCOS are realized without the hurdles from the controlling agencies in the Sector. APCOS should have the freedom to develop all possible partnership and networks for promoting welfare and development of small and marginal dairy farmers

26. The Initiative of the government from the period 2005-06 to 2009-10 has helped to increase the milk production in the state as well as to maintain the number of milk pouring members in APCOS without much variation in spite of the various constraints and problems of the dairy sector in Kerala. The Budgetary allocation for dairy sector is to be increased to provide necessary support for the small and marginal farmers in the State.

27. The number of local level consumers of milk has increased during the period 2005-06 to 2009-10, creating increased opportunity for APCOS for local sale of milk with better profit margin. The APCOS should have the necessary autonomy with changes in the cooperative rules so that APCOS could start organized retail sale of fresh milk in the locality which would enhance the income of marginal dairy farmers.

28. Significant increase is observed in the total asset value of APCOS during the period 2005-06 to 2009-10 with progressive increase in the resources of APCOS and the asset formed are spread all over state without any major variations. This large network of village level resources and facilities for dairy enterprises are to be further strengthened with government granting necessary autonomy for dairy cooperative organizations to function effectively for the welfare of small and marginal farmers.

29. Establishing dynamic partnership between the APCOS and Social Work Institutions for strengthening the livelihood opportunities of the small and marginal farmers
The study has revealed that the dairy farmers have no meaningful contact or access to the higher education institutions. The APCOS are also found to have no network or linkage with neighbouring colleges. Not even a single farmer or APCOS in the study is found to be linked to any of the social Work Institutions in Kerala. At the same time about 12.8 % of the farmers have perceived that linkages with social work institutes are beneficial for farmers.

Extension is an essential component of higher education where the institutions reaches out to the local community with their knowledge and other competence to help the people to solve their problems as well as to create new avenues for socio-economic development of the locality. Social work training in community practices demands that the learners establish community relationships and make assessment of the community and organize the people by way of forming and strengthening the people’s organizations for community development. The capacity building of local producer organization is a proven strategy for the community economic development which ultimately results in community development. The study has also revealed that the training in, cooperative foundations of people’s organizations, multiple aspects of dairy farming, leadership development of presidents and governing board members, enhancing women participation in dairy cooperatives, linking dairying with organic farming, financial inclusion of dairy farmers, ICT training for farmers etc. are areas where farmers can be helped by social work institutes. The field work training of social work students in community setting can be linked with the village dairy cooperatives. The social work learners can collaborate with KCMMF and Government Agencies of Diary Development and Animal Husbandry in linking maximum farmers with the training programmes and other projects in dairy sector. The social workers can create better awareness among farmers about their cooperative advantages, importance of achieving autonomy for cooperatives and organize farmers to face the challenges in the cooperative dairy sector. The social work teaching and research institutions can link livelihood related projects and research studies in development sector with farmers through the APCOS.

16. Conclusion

The present study is a situational analysis of the village milk cooperatives in Kerala with reference to the Aanad Pattern Cooperative Societies (APCOS). It has presented an overall situation of dairy farmers and dairy cooperatives. The dairy cooperatives have organized the small and marginal dairy farmers and created the necessary infrastructure facilities and marketing network for successful dairy farming. The demand for milk and
milk products are increasing even in rural areas with significant increase in the number of local consumers of milk from the village dairy cooperatives. The dairy farmers have very consistent perception about the strengths of the APCOS in organizing farmers and creating the ‘common assets’ for dairy based livelihood in villages and consider that APCOS have the capacity to overcome the challenges in dairy farming by reorganizing its strengths.

The study has revealed that dairy farming activity is profitable if farmers adopt scientific as well as cost effective strategies in dairy farming. The farmers who have obtained the required training in dairy farming were found to be earning reasonable return and the dairy farming practices are becoming supportive for reducing the input cost of agriculture and household expenditure. Training in multiple aspects of dairy management can be better facilitated by utilizing the existing support services and linkages in diary sector in the state where the APCOS can facilitate such programmes for the maximum benefit of its member farmers.

Since United Nations Organization is celebrating 2012 as International year of Cooperatives to acknowledge the contribution of cooperatives towards social development, the APCOS, the village level producer organizations can do introspective analysis about their strengths, weakness, opportunities and threats to reaffirm the importance of cooperative organizations in socio-economic development of the small and marginal dairy farmers of Kerala. The challenges in achieving the autonomy for cooperatives which alone can promote growth and empowerment of the members must be brought in for further discussions and debate so that goal could achieved at the earliest.

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