CHAPTER-7

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India is predominantly an agricultural country with about 70% of its population dependent on income from agriculture. Animal husbandry is an adjunct to crop agriculture and cattle and buffaloes are kept for milk production, motive power for various farm operations, village transport, irrigation, and production of manure. The animals are generally maintained on agricultural byproducts and crop residues. Mostly small and marginal farmers and landless labourers with holding size of 2-3 animals per farm farmer do animal rearing. Average land holding with these owners is very meager, being $\frac{1}{2}$ to 2 acres. Livestock rearing provides employment and supplementary income to the vast majority of rural farmers, the majority of who are landless and marginal farmers.

India had 204 million cattle and 84 million buffaloes. The total crossbred female population, including young stock was estimated to be about 10.6 million in 1992, of which the southern region accounted for about 45%. The share of other regions was: northern (25%), eastern (20%) and western (10%). In areas where cross-breeding is getting popular, the population of low producing desi cows is declining. The density of bovine population varied as per land area, agricultural conditions, availability of feed and fodder and socio-economic conditions. On an average 100 ha of cropped area sustained 151 bovine comprising 111 cattle and 40 buffaloes. Stocking rate differed significantly in different regions. The cattle density per 100 ha of cropped area was highest in the eastern region (182)
lowest in the northern region (90) whereas reverse was true for buffaloes (52 in northern and 26 in southern region).

Cattle were fairly distributed all over the country (18-31%). The concentration of buffaloes was highest in northern region (46%) and lowest in eastern region (11%). The productivity per animal between regions varied due to quality of cattle and buffaloes and availability of inputs as especially feed and fodder.

The gross value of output from livestock sector alone at current prices was about Rs. 1114 billion (1997-98), which is about 25% of the value of the output of Rs. 4495 billion from agriculture sector. This excludes the contribution of the animal draught power. Milk alone contributed around 63% to the total output from livestock. Cattle and buffaloes in addition to providing much needed milk and to some extent meat play an important role in utilization of agricultural by-products, which are non-edible to human beings. They also provide raw materials/ by-products such as hides and skins, blood, bone, fat and casings for industrial use. Farm manure is a useful income generating products of the sector. Animal power for transportation and agricultural operations, particularly in rural areas also makes a significant contribution.

A marginal increase in milk production from 17 million tones in 1995-51 to 22 million tones in 1970-71 was achieved. The increase, however, was large between 1980-81 (31.6 million tones) and 1990-91 (53.7 million tones). The production of milk for the year 1998-99 was 74.7 million tones which would make per capita availability to be 212 g per day against the recommended level of 220g. This enhanced growth in milk production is
because of various cattle and buffalo development programmes and large scale crossbreeding in dairy cattle.

Around 70.6 million draught animals (mostly cattle and buffalo) contribute 20% of the energy input into crop farming. Although contribution of draught (DAP) sharply reduced from 72% in 1961 to 23% in 1991 mainly due to mechanization, the requirement of DAP shall continue to be around 20% in years to come.

A large increase in buffalo meat production both for internal consumption and export has been noted in the last few years. The export of buffalo meat went up from 101,666 tonnes valued at Rs. 2,808 million in 1995-96 to 176,329 tonnes valued at Rs. 7,293 million in 1997-98. This export is going to go up in view of establishment of export abattoirs and improvement of existing abattoirs. Considerable export earnings are obtained from export of animal by-products.

Artificial insemination network in addition to providing semen of indigenous cattle and buffalo breeds and crossbred cattle is also used for dissemination of semen of temperate dairy cattle through crossbreeding to increase milk production. To meet the semen requirement, sires of various cattle breeds maintained at the main germplasm units some of which also have the facilities of deep-freezing of semen. Improvement in cattle and buffalo production is also directed at improvement through feeding, generation of marketing facilities, advisory service and veterinary aid.

Institutional structures funded by government also exist. These maintain herds of cattle and buffalo which act as nucleus or multiplier herds for purposes of training and research. Some farms have been established for production quality bulls and undertaking progeny testing programmes for
some important indigenous breeds. Large government herds like military dairy farm also exist for commercial milk production. These herds are being used for developing new dairy breeds and for spreading superior germplasm to rural areas for improvement of native cattle.

The operation flood (FO), which has been implemented in three phases over 26 years covers some nine million-farmer families in 170 milk-sheds in 22 states union territories under co-operative umbrella. The operation flood programmed also provides animal health, breeding and marketing facilities. It also available compound and other feed and related technologies for improved cattle and buffalo productivity.

The advances in animal husbandry, in general, and dairying (crossbred cattle and buffalo) in particular have greatly helped in improving the economic status of rural population in India. The availability of crossbred dairy animals and high producing buffaloes has made dairying a remunerative business. Crop and dairy enterprise combination among various livestock is best suited for most of the areas. Milk production through crossbred chattel has led to increase in income of the farmers in almost all the regions of the country including drought prone, dry land and rain fed areas. Dairy enterprise was on the top with regard to profit in marginal, small and medium category of farmers.

India accounts for a significant share of world’s livestock resources with nearly 57 percent of world’s buffaloes, 16.2 percent of cattle, 16.2 percent of goats, 5.7 percent of sheep and 5 percent of poultry (FAO, 2004). Though the contribution of agriculture and allied sectors to the national gross domestic (55 percent in the early 1950s to 39.5 percent in 1981-82 and 23.9 percent in 2001-02), livestock sector has been among the
few high- growth sectors in rural India. The importance of livestock sub-sector can be gauged from the contribution it makes to the national economy. Livestock sector accounted for 25.5 percent of agricultural GDP, and about 5.6 percent of total GDP in 2001-02. The share of livestock in the gross value of agricultural outputs (at 1993-94 prices) has increased from 18.6 percent in 1971-72 to 35.5 percent in 2001-02(CSO, 2003). The dairy sector contributes the largest share in agricultural GDP. The large contribution that livestock sector makes to the national economy is a reflection of multiple roles that livestock plays in the farming systems in the country.

The growth in value of output of major livestock products in the country at 1993-94 constant prices over the last five decades. The total livestock output has increased more than four times in the last five decades. According to the Central Statistical Organisation (CSO) estimates, the gross value of output from Rs. 20,856 crores in 1950-51 to Rs. 88,331 crores in 2001-02(CSO, 2003). The dairy and poultry are high- growth sectors and is reflected in the growing importance of the contribution of these sub-sectors in the livestock economy. While output in dairy sector increased by 11.2 times and poultry meat by five times. The wool and hair, and dung are the slow-growth sub-sector. The share of milk group in total value of output from livestock sector has increased from about 55 percent in 1951-52 to over 68 percent in 2001-02 (Table-1: 1). The share of meat sector has declined from 20.8 percent to 16.8 during the same period but the share of poultry sector (meat and eggs) has increased from 5.8 percent to 10.3 percent. The share of dung (fuel and manure) has declined significantly from 21.8 percent in 1950-51 to about 7 percent in 2001-02. The use of
dung as fuel has declined significantly from 12.3 percent in early 1950s to nearly 4 percent in 2001-02, while the share of dung as source of manure has fallen from 0.9 percent to 0.25 percent over the same period. The importance of poultry sector has increased at a faster rate compared to other sub-sectors during the last two decades. The share of poultry has increased from about 7.7 percent has in 1881-82 to little over 10 percent in 2001-02, while the share of meat sector has remained almost constant.

The value of output from livestock sector grew at an annual compound growth rate of 3.12 percent between 1950-51 and 2001-02, ranging from 0.72 percent in the sixties to 4.77 percent in the 1980s (Table-1: 2). Among all livestock products, eggs witnessed the highest growth (5.37 percent), followed by poultry meat (3.94 percent), and milk growth (3.65 percent). The wool and hair sub-sector registered a negative growth. All livestock sub-sector registered the highest growth during the decade of 1980s except for meat products and dung, while in 1990s there was deceleration in growth in all sub-sector is mainly attributed to the successful implementation of the Operation Flood and other dairy development programmes implemented by the central and the state governments, while growth in poultry sector can be attributed to a large part to the private poultry industry initiatives. The development of poultry industry in India within a span of just two decades is remarkable. From rural backyard poultry production catering to the domestic market prior to the 1980s, the sector has transformed itself into advanced industrial production in some states.

It has long been recognized that women have an important role in livestock production, care and management and in the processing and
sale of livestock production. In this sector, women's work includes collection of fodder and water, cooking grains for cattle, preparation of concentrate feed for animals, feeding the animals, cleaning and washing cattle shed, cleaning and bathing animals, milking, preparation of milk products, taking the animals for roadside grazing, management and marketing of milk, collection of cow-dung, preparation of cow-dung cakes and their storage, and preparing manure for the farm. Though more than 95% of the work related to animal care is performed by feminine gender, they do not own cows.

The Bundelkhand region comprising of parts of Uttar Praddesh (Banda, Jalaun, Hamirpur, Jhansi, Lalitpur, Mahoba and Chitrakoot district) and M.P.(Datia,Tikamgarh,Chhatarpur,Panna) India has a semiarid environment and is predominantly an agricultural economy. Bundelkhand has 9.2 million livestock (cattle, Buffalo, Goat, and sheep are 5.4, 1.6, 1.8 and 0.4 million, respectively) population, which is one of the densest in terms of livestock per unit of cultivated land. Average size of the land holding in Bundelkhand is 1.28 ha. Of which most of them are marginal farmer who dependent wholly or partially on livestock farming of the available land less than1% is used for the cultivation of fodder crops and majority of the fodder fed to the livestock being sourced from the crop residues. About 19.87-lakh ha. of land is available for grazing of the 30.16-lakh adult cattle units (ACU) in Bundelkhand region. Average production of forage from this grazing area is less than 21/ha/year, which is not even sufficient for one adult cattle unit (ACU) as the normal requirement is 2.55/year. Livestock production in this region heavily depends on traditional feeding methods including most common "Anna Pratha". Further,
sustained and high production growth rates, combined with limited and rapidly diminishing land holds and land for food grains and cash crops led to shortage of feed and fodder to livestock in this region, which resulted in over grazing of the available land and practice of "Anna Pratha". The over grazing pressure (ACU/ ha) was 4.74 in UP part of Bundelkhand. While it was 2.84 in the MP. part. To over come this problem, efforts are necessary to increase forage production through establishment of proven silvipastoral systems on waste and community land. It produces 4.61 of forage (ha/year) and further practice of rotational grazing will allow belittling damage due to grazing and fulfilling the feeding requirements of livestock.

**OBJECT OF THE STUDY:**

Keeping the above consideration in mind, the present study has been conducted with the following specific objectives:

a. To study of nature and extent of co-operative dairy enterprise in village of Bundelkhand region of Uttar Pradesh.

b. To analysis cost and return per unit [per litter] of milk in Bundelkhand region.

c. To examine comparative socio-economic aspects co-operative and non-cooperative dairy enterprising women in Bundelkhand Region of Uttar Pradesh.
d. To examine marketable surplus and different channels used in marketing of milk and its production Jhansi district.

e. To suggest remedies and measures for stream ling the adoption of dairy innovation in order to uplift the economy of dairy.

HYPOTHESIS OF THE STUDY: -

Keeping in view the objectives of the present study the following hypotheses have been formulated: -

a. The main source of Income livestock and dairy enterprise after agriculture crops in different source of income in Bundelkhand Region.

b. Per unit Expenditure decrease to milk production along with size increase of farm unit.

c. Participation of women more than man in dairy enterprise.

d. The share increases in consumer value to productive along with decrease to arbitrator in different channel of milk marketing.

e. Milk and milk product, production and consumption increase along with farm area increase.
METHOD OF THE STUDY:

1) SAMPLING DESIGNS:

A multi-stage stratified random sampling design has been adopted to select districts, block, villages and dairy household.

(a) SELECTION OF DISTRICT:

The study was conducted in Jhansi district of Bundelkhand region. Jhansi district was selected randomly it represent Bundelkhand region. The cropping intensity of the Jhansi district was 120% in the year 2000-01.

(b) SELECTION OF BLOCK:

First of all, a list of block of Jhansi district was taken from C.D.O. office, Jhansi. There were 8 blocks in Jhansi viz. Baragaon, Bavina, Month, Chirgaun, Bamaur, Gursaray, Bangra and Mauanipur. Out of these 8 blocks, two block were selected randomly viz Mauanipur and Gursaray.

(c) SELECTION OF VILLAGES:

First of all, the list of village falling in Mauanipur block taken from B.D.O.offices. The total number of villages in the block...
was 83. Simultaneously from block Gursaray also taken a list of villages was taken there were 103 villages falling in the block. All the villages were arranged in alphabetical order. Then a sample of 4 villages, two from block was taken. Hence two villages namely Bhitora and Tejpura were selected randomly from Mauvanipur block. Similarly from block Gursaray two villages namely KedarTai and Bagroni Jageer were selected randomly for the present study. “Thus 4 villages selected for the study”.

(d) SELECTION OF SAMPLE FARMER: -

A list of all the growers of milk with their owned holdings was prepared for the selected villages. The total number of growers in the four selected villages was about 600. Then the farmers were categorized into four-farm size group viz. marginal (0-1 hectares), small (1-2 hectares), medium (2-4 hectares) and large (Above 4 hectares). The number of farmers falling in marginal, small, medium and large farm size groups came 300, 150, 100 and 50 respectively. After doing so, a sample of 120 cases was taken randomly. The final selection was made from the different strata based on production to its size. Thus 60 cases in marginal, 30 in small, 20 in medium and 10 in large farm size group were selected for the present study randomly as show by the table No. 2:1.
Table No. 2:1 case selected for the present study

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Size group</th>
<th>Total No. of cases</th>
<th>Cases selected</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Marginal (0-1 hect.)</td>
<td>300</td>
<td>60</td>
</tr>
<tr>
<td>2.</td>
<td>Small (1-2 hect.)</td>
<td>150</td>
<td>30</td>
</tr>
<tr>
<td>3.</td>
<td>Medium (2-4 hect.)</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>4.</td>
<td>Large (&lt; 4 hect.)</td>
<td>50</td>
<td>10</td>
</tr>
<tr>
<td>5.</td>
<td>Total</td>
<td>600</td>
<td>120</td>
</tr>
</tbody>
</table>

(e) SELECTION OF MILK MARKETING AGENCIES:

1. Milkman → Consumer.
5. Milkman → Vender → Milk Co-operative Society → Consumer.
2) **COLLECTION OF DATA:**

The present study was based on primary as well as secondary data. The primary data were collected through well prepared Schedules and Questionnaires. A pilot survey was conducted to test the schedule and questionnaire. The whole primary data were collected within three or four meetings with the respondents. The secondary data were recorded from the record of different marketing agencies. The primary data relate to year 2002-2003.

3) **SOURCE OF DATA:**

The data to be used have been two types viz.

I. **Primary data:**

"The primary data is one which is collected by the investigator himself for the first time."

The primary data were gathered through preproposed Schedules and Questionnaire by personal interview.

II. **Secondary data:**

"Data which are obtained from published or unpublished sources are known as secondary data."
a) **PUBLISHED SOURCES:**

There are certain international, national and local agencies, which publish statistical data on a regular basis.

- Statistical Year Book,
- Indian Journal of Agricultural Economics,
- Yojana,
- Kurukshtra
- Committee Reports,
- Private Publication,
- Newspapers and Magazines,
- Individual Research Scholars, etc.

b) **UNPUBLISHED SOURCES:**

There are various sources of unpublished data such as the records maintained by the various governments and private offices, B.D.O. office, Agricultural office, Dairy coo-perative office studies made by the Research Scholars in the universities and other research institutions, etc.

4. **METHODS OF ANALYSIS:**

(A). Estimation of cost of Production of milk.

(a) **Evaluation of cost item: For cost of Milk Estimation:**
i.) **FAMILY LABOUR:** -

The family labour was charge at the wage rate prevailing the locality for permanent hired labour i.e. Rs. 10/ per labour per day.

ii.) **MILK PRODUCTION:** -

The milk production was evaluated at the rate of the price prevailing during the period in the village i.e. about Rs. 8 per litre of milk.

iii.) **EXCHANGE LABOUR:** -

The exchange labour was treated as family labour was treated as family labour was evaluated at the simple rate at which the family labour was evaluated i.e. Rs. 10 per labour per day.

(B) **COST OF PRODUCTION PER LITRE OF MILK:** -

The total cost, which includes variable cost and fixed cost, was estimated. There are two methods for apportionment of total cost among the main and by product.

i. **PROPORTIONATE METHOD:** -

Under this method, the total cost of milk was divided in the ratio of the value of main product and by product is estimated separately.
ii. **DEDUCTIVE METHOD:** -

Under this method, the value of by product is deducted from the total cost of milk production. Then the remaining cost is divided by the amount of main product to calculate the cost of production per litre.

In present study the proportionate method has been used to calculate the cost of production of milk.

5. **STATISTICAL TECHNIQUES TO BE USED:** -

Tabular analysis has been mode analysis of data. Ratio, percentage, Weighted, average, mean, statistical deviations etc. have also been calculated for the presentation.

The overall average, the proportion of various category of dairy household of marginal farmer, small farmer, medium farmer and large farmer came to 60 (50.00 percent), 30 (25.00 percent), 20 (16.67 percent) and 10 (8.33 percent) respectively.

The overall average size of family during the year 2002-03 was come to 5.12. It comprises family size of Adult-male-1.47, female-1.34 and children- male-1.29 and female-1.02. In case of co-operative dairy household and non-co-operative dairy household, family size was came to 4.98 and 5.27 respectively. It can be conclude that average size of family
was small in case of co-operative dairy household compare to non-cooperative dairy households.

The overall average sex ratio, during the year 2002-03 was came to 854.98. In case of co-operative dairy household and non-co-operative dairy household, sex ratio came to 868.75 and 869.82 respectively. In case of co-operative dairy household, the average sex ratio of marginal farmer, small farmer, medium farmer and large farmer was came to 909.09, 829.27, 800.00 and 882.35 respectively. In case of non-co-operative dairy household, the average sex ratio of marginal farmer, small farmer, medium farmer and large farmer was came to 908.16, 837.84, 863.64 and 666.67 respectively. The sex ratio came to low in both case of co-operative & non-co-operative dairy household in compare to National sex ratio i.e. 933.

The overall average, participation of women in different dairy activities- like milking, feeding, grazing, breeding, water drinking, cleaning, supervision, maintenance of cattle shed and dung-cake making came to 22.50 percent, 83.75 percent, 84.58 percent, 75.83 percent, 91.25 percent, 100.00 percent and 53.33 percent respectively. In case of co-operative dairy household, participation of women in different dairy activities of marginal farmer, small farmer, medium farmer and large farmer came to 79.00 percent, 67.33 percent, 54.00 percent and 34.00 percent respectively. In case of non-co-operative dairy household, participation of women in different dairy activities of marginal farmer, small farmer, medium farmer and large farmer came to 80.81 percent,
66.36 percent, 57.50 percent and 38.75 percent respectively. It can be conclude that, average participation of women in different dairy activities decrease with their farm size in both case of co-operative dairy household & non-co-operative dairy household.

With regard to time spent, the result of the present study indicates that maximum time was spent in weeding (236.46 hrs/year) followed by harvesting (132.31 hrs/year), sowing (75.04 hrs/year) and manuring (60.53 hrs/year).

The overall average literate family member during the year 2002-03 was come to male-2.01 (72.18 percent), female-1.65 (69.61 percent). In case of co-operative dairy households, the literate male and female of marginal farmer, small farmer, medium farmer and large farmer came to male 1.88 (71.50 percent) and female 1.61 (69.00 percent), male 1.97 (72.33 percent) and female 1.59 (70.10 percent), male 1.98 (75.50 percent) and female 1.28 (71.00 percent) and male 2.57 (75.59 percent) and female 2.17 (72.50 percent). In case of non-co-operative dairy household, literate male and female of marginal farmer, small farmer, medium farmer and large farmer came to male 1.87 (70.00 percent) and female 1.64 (69.92 percent), male 2.39 (71.50 percent) and female 1.94 (68.80 percent), male 1.99 (72.61 percent) and female 1.64 (69.00 percent) and male 2.22 (74.00 percent) and female 1.43 (71.40 percent) respectively.
The overall average illiterate family member during the year 2002-03 was come to male-0.78 (27.82 percent), female-0.71 (30.39 percent). In case of co-operative dairy household and non-co-operative dairy household, illiterate family member came to 0.72 (26.76 percent), female-0.69 (30.08 percent) and 0.83 (28.80 percent), female-0.74 (30.46 percent) respectively. The study revealed that average literacy rate was high in case of male in compare to female. Average literacy increased with their farm size in both cases of co-operative & non-cooperative dairy households. In case of non-co-operative dairy households average literacy rate was increased at lower rate compare to co-operative dairy households.

The group wise literacy of family member it can be divided into three-group 1- Up to 5th, 2- 5th to 10th and 3- above 10th in different category of co-operative and non-cooperative dairy household The overall group wise literacy of family member during the year 2002-03 was came to Up to 5th male 104.95 person (43.43 percent) and female 104.76 person (53.03 percent), 5th to 10th male 95.15 person (39.37 percent) and female 88.43 person (44.76 percent) and above 10th male 41.55 person (17.02 percent) and female 4.37 person (2.21 percent). It can be concluded that, maximum literate family member was group 1st (Up to 5th ) followed by group 2nd (5th to 10th ) and group 3rd (above 10th ). The women literacy percentage was low comparing to man.

The economic category during the year 2002-03 of co-operative & non-cooperative dairy household according to land holdings."
economic categories show the land holding of the farmers.”

The farmers may be classified in the 4 categories according to their holdings. Viz. Marginal farmer (0<1 ha.), Small farmer (1-2 ha.), Medium farmer (3-4 ha.) and Large farmer (4 > ha.). In case of co-operative & non-cooperative dairy household, of marginal farmer, small farmer, medium farmer and large farmer were came to 50.00 percent, 25.00 percent, 16.67 percent and 8.33 percent respectively. Thus, majority of the farmer marginal farmers followed by small farmers both of farmers were 75 percent of the total no. of dairy household.

The operational holding during the year 2002-03 per family in different category of co-operative & non-cooperative dairy household according to land holdings. In case of co-operative & non-cooperative dairy household, the all-average area owned, cultivated area, irrigate area and unirrigate area was came to 1.7216 ha. and 1.2647 ha. 1.6598 ha. and 1.397 ha. 1.5354 ha. (92.50 percent) and 1.28 ha. (91.62 percent) and 0.1244 ha. (7.50 percent) and 0.117 ha. (8.38 percent). As a result that, the land holding increased in both cases of co-operative & non-cooperative dairy household with there farm size.

The social category during the year 2002-03 of dairy household in Bundelkhand Region. The table revealed that, major part of dairy household was from Schedule cast / Schedule tribes (SC / ST) and Other backward who, as about 46.67 percent and 42.50 percent only 9.17 percent out of total dairy household were belong to general category. It
can be conclude that majority of the dairy household was belong to SC / ST followed by OBC and General.

The overall average no. of milch animal during the year 2002-03 came to 2.01. In case of co-operative dairy household, the number of buffalo and cow came to 1.55 (79.49 percent) and 0.4 (20.51 percent) respectively. In case of non-co-operative dairy household, the number of buffalo and cow came to 1.51 (73.39 percent) and 0.55 (26.61 percent) respectively. Thus, proportionately more no. of buffaloes in comparison to cow were maintained by the dairy households. The studies further conclude that proportion of buffaloes in the milch animal was comparatively higher in case of co-operative dairy households.

The overall average, value of per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.7273, Rs.9439.74, Rs. 12558.69 and Rs. 13016.13 respectively. In case of co-operative dairy household, value of per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.7719.51, Rs.9784.21, Rs. 13204.35 and Rs. 14173.33 respectively. In case of non-co-operative dairy household, value of per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.6866.67, Rs.9112.5, Rs. 11913.04 and Rs. 11931.25 respectively. The study revealed that per milch animal value was higher in case of co-operative cooperative dairy household and it increased in both cases with the size of holding.
The overall average, milk production *per milch animal* during the year 2002-03 was come to 1332.66 litres per annum. Average milk production per milch animal in case of co-operative & non-co-operative dairy household, 1423.78 litres and 1246.68 litres respectively per annum. In case of co-operative dairy household milk production per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to 1273.8 litres, 1365.1 litres, 1609.65 litres and 1697.25 litres respectively. In case of non-cooperative dairy household milk production per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to 1095 litres, 1135.15 litres, 1500.15 litres and 1587.75 litres respectively. It can be concluded that, milk production per milch animal was higher in case of co-operative dairy household and it increased with their farm size in both cases co-operative & non-co-operative dairy households.

The overall average, milk production *per farmer* during the year 2002-03 was come to 2676.42 litres per annum. Average milk production per farmer in case of co-operative & non-co-operative dairy household, 2776.37 litres and 2576.47 litres respectively per annum. In case of co-operative dairy household milk production per farmer of marginal farmer, small farmer, medium farmer and large farmer came to 1740.92 litres, 3458.25 litres, 3702.19 litres and 5091.75 litres respectively. In case of non-cooperative dairy household milk production per farmer of marginal farmer, small farmer, medium farmer and large farmer came to 1642.5 litres, 3027.07 litres, 3450.34 litres and 5080.8 litres respectively. It can
be concluded that, milk production per farmer was higher in case of co-operative dairy household and it increased with their farm size in both cases co-operative & non-co-operative dairy households.

The overall average, milk production, consumption and marketed surplus per farmer came to 7.33 litres, 2.40 litres (32.74 percent) and 4.93 litres (67.26 percent) respectively per day. In case of co-operative dairy household, milk production, consumption and marketed surplus of marginal farmer, came to 4.77 litres, 1.77 (37.11 percent) 3 litres (62.89 percent) respectively. In case of small farmer, milk production 9.47 litres, consumption 3 (31.68 percent) and marketed surplus came to 6.47 litres (68.32 percent). In case of medium farmer milk production 10.14 litres, consumption 3.14 (30.97 percent) and marketed surplus came to 7 litres (69.03 percent). In case of large farmer, milk production 13.95 litres, consumption 4.95 (35.48 percent) and marketed surplus came to 9 litres (64.52 percent) per day. In case of non-cooperative dairy household, milk production, consumption and marketed surplus of marginal farmer, came to 4.50 litres, 1.52 (33.33 percent) and 3 litres (66.67 percent) respectively. In case of small farmer, milk production 8.29 litres, consumption 2.29 litres (27.62 percent) and marketed surplus came to 6 litres (72.38 percent). In case of medium farmer milk production 9.45 litres, consumption 3.00 (31.74 percent) and marketed surplus came to 6.45 litres (68.26 percent). In case of large farmer, milk production 13.92 litres, consumption 4.92 (35.35 percent) and marketed surplus came to 9.00 litres (64.65 percent) per day. The study revealed that, the average milk production, consumption and marketed surplus increased with their
farm size in both cases co-operative & non-cooperative dairy household the average milk production, consumption and marketed surplus was higher in case of co-operative dairy household in compare to non-cooperative dairy household.

The overall average, season wise milk production *per milch animal* during the year 2002-03 in rainy season, winter season and summer season was came to 413.12 litres (31.00 percent), 568.95 litres (43.44 percent) and 340.49 litres (25.56 percent) respectively per annum. In case of co-operative dairy household, season wise milk production per milch animal of rainy season, winter season and summer season was came to 440.23 litres (30.92 percent), 619.78 litres (43.53 percent) and 363.77 litres (25.55 percent) respectively per annum. In case of non-co-operative dairy household, season wise milk production per milch animal of rainy season, winter season and summer season was came to 387.72 litres (31.10 percent), 540.43 litres (43.35 percent) and 318.53 litres (25.55 percent) respectively per annum. It can be concluded that, highest milk production was came during winter season followed by rainy season and lowest milk production came during in summer season in both cases of co-operative & non-cooperative dairy household.

The overall average, season wise milk production *per farmer* during the year 2002-03 in rainy season, winter season and summer season was came to 8296.91 litres (31.00 percent), 1162.64 litres (43.44 percent) and 6864.84 litres (25.56 percent) respectively per annum. In case of co-operative dairy household, season wise milk production per farmer of
rainy season, winter season and summer season was came to 858.45 litres (30.92 percent), 1208.55 litres (43.53 percent) and 709.36 litres (25.55 percent) respectively per annum. In case of non-co-operative dairy household, season wise milk production per farmer of rainy season, winter season and summer season was came to 801.25 litres (31.10 percent), 1116.9 litres (43.35 percent) and 658.29 litres (25.55 percent) respectively per annum. It can be concluded that, highest milk production came in winter season followed by rainy season and the lowest milk production in summer season in both cases of co-operative & non-cooperative dairy household.

The overall average, cost of milk production per litre was came to Rs. 7.00. In case of co-operative dairy household, average cost of milk production per litre of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 7.10, Rs. 7.11, Rs. 7.09 and Rs. 7.09 respectively. In case of non-co-operative dairy household, average cost of milk production per litre of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 7.12, Rs. 7.12, Rs. 7.11 and Rs. 7.11 respectively. It can be conclude that milk production per litres more and less it in all cases different category of dairy households.

The distribution of milk through marketing channel 1st came to 53928.8 litres (25.00 percent), channel 2nd 47543.61 litres (22.03 percent), channel 3rd 53325.49 litres (24.71 percent) and channel 4th 60960.88 litres (28.26 percent) per annum. In case of marginal farmer milk production of channel 1st, 2nd, 3rd and 4th came to 21116.44 litres (32.55 percent),
16925.90 litres (25.85 percent), 7791.80 litres (11.90 percent) and 19643.21 litres (30.00 percent) respectively per annum. In case of small farmer milk production of channel 1st, 2nd, 3rd and 4th came to 17707.78 litres (25.52 percent), 16471.24 litres (24.11 percent), 17256.89 litres (25.26 percent) and 16881.14 litres (24.71 percent) respectively per annum. In case of medium farmer milk production of channel 1st, 2nd, 3rd and 4th came to 8491.88 litres (17.29 percent), 10161.77 litres (20.69 percent), 16217.57 litres (33.02 percent) and 14243.18 litres (29.00 percent) respectively per annum. In case of large farmer milk production of channel 1st, 2nd, 3rd and 4th came to 6612.70 litres (20.13 percent), 3984.70 litres (12.13 percent), 12059.23 litres (36.71 percent) and 10193.35 litres (31.03 percent) respectively per annum. A perusal of the table distribution of milk marketing agencies per farmer revealed that Channel 4th was more efficient in compares to others. The table further reveals that 1st, 2nd and 3rd Channels more or less equally efficient.

The overall average, maintenance cost per milch animal during the year 2002-03 came to Rs. 9900.35 per annum. In case of co-operative dairy household the average maintenance cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 9450, Rs. 10145, Rs. 11860 and Rs. 12520 respectively. In case of non-co-operative dairy household the average maintenance cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 8200, Rs. 8495, Rs. 11115 and Rs. 11750 respectively. It can be concluded that, maintenance cost per milch animal increased in both cases of co-operative & non-co-operative dairy household with their farm
size. The table further revealed that maintenance cost came higher in case of co-operative dairy household.

The overall average, maintenance cost per household during the year 2002-03 came to Rs. 19883.21 per annum. In case of co-operative dairy household the average maintenance cost per farmer of marginal farmer, small farmer, medium farmer and large farmer came to Rs 12915, Rs 25700.67, Rs 27278 and Rs 37560 respectively. In case of non-cooperative dairy household the average maintenance cost per farmer of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 12300, Rs. 22653.33, Rs. 25564.5 and Rs. 37600 respectively. It can be concluded that, maintenance cost per farmer increased in both cases of co-operative & non-cooperative dairy household while the higher maintenance cost in case of co-operative dairy household compare to non-cooperative dairy households.

The overall average, net-maintenance cost per milch animal during the year 2002-03 came to Rs. 9474.56 per annum. In case of co-operative dairy household the average net-maintenance cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 9040, Rs. 9710, Rs. 11410 and Rs. 12030 respectively. In case of non-cooperative dairy household the average net-maintenance cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 7800, Rs. 8085, Rs. 10680 and Rs. 11300 respectively. It can be concluded that, net-maintenance cost per milch animal increased with their land holding in both cases of co-operative & non-cooperative dairy
household but it higher in case of co-operative dairy household than non-cooperative dairy household.

The overall average, net-maintenance cost per household during the year 2002-03 came to Rs. 19028.07 per annum. In case of co-operative dairy household the average net-maintenance cost per farmer of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 12354.67, Rs. 24598.67, Rs. 26243 and Rs. 36090 respectively. In case of non-cooperative dairy household the average net-maintenance cost per farmer of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 11700, Rs. 21560, Rs. 24564, and Rs. 36160 respectively. It can be concluded that, net-maintenance cost per farmer increased in both cases of co-operative & non-cooperative dairy household but it higher in case of co-operative dairy household than non-cooperative dairy household.

The overall average, variable cost per milch animal during the year 2002-03 came to Rs. 7886.75 per annum. In case of co-operative dairy household the average variable cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.7525.98, Rs.8085.56, Rs. 9447.68 and Rs. 9974.68 respectively. In case of non-cooperative dairy household the average variable cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.6534.58, Rs.6765.42, Rs. 8851.99 and Rs. 9356.52 respectively. It can be concluded that, variable cost per milch animal increased with their size of holding in both cases of co-operative & non-cooperative dairy
households. It came higher in case of co-operative dairy household in compare to non-cooperative dairy household.

The overall average, fixed cost per milch animal during the year 2002-03 came to Rs. 1357.95 per annum. In case of co-operative dairy household the average fixed cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.1924.02, Rs. 2059.43, Rs. 2412.32 and Rs. 2545.31 respectively. In case of non-cooperative dairy household the average fixed cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 1665.42, Rs.1729.58, Rs. 2263.01 and Rs. 2393.47 respectively. It can be concluded that, fixed cost per milch animal increased with their farm size in both cases of co-operative & non-cooperative dairy household but it higher in case of co-operative dairy household in compare to non-cooperative dairy household.

The average feed cost per milch animal, came to green fodder Rs.1802.77, dry fodder Rs. 3348.84 and concentrate Rs. 982.06 per annum. In case of co-operative dairy household the average feed cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to green fodder Rs.1717.79, dry fodder Rs. 3189.59 and concentrate Rs. 935.43, green fodder Rs.1868.46, dry fodder Rs. 3470 and concentrate Rs. 1016.85, green fodder Rs. 2188.44, dry fodder Rs. 4064.89 and concentrate Rs. 1192.88 and green fodder Rs. 2324.26, dry fodder Rs. 4323.16 and concentrate Rs. 1269 per annum. In case of non-cooperative dairy household the average feed cost per milch animal of
marginal farmer, small farmer, medium farmer and large farmer came to green fodder Rs. 1456.30, dry fodder Rs. 2704.56 and concentrate Rs.792.54, green fodder Rs. 1501.46, dry fodder Rs. 2788.43 and concentrate Rs.817.12, green fodder Rs. 2078.33, dry fodder Rs. 3860.36 and concentrate Rs. 1132.86 and green fodder Rs.2152.75, dry fodder Rs4004.15 and concentrate Rs. 1175.36 per annum. The study revealed that, feed cost per milch animal increased with their farm size of holding in both cases of co-operative & non-cooperative dairy household.

The overall average, labour cost per milch animal during the year 2002-03 came to Rs. 1470.02 per annum. In case of co-operative dairy household the average labour cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.1417.5, Rs.1440.79, Rs. 1660.4 and Rs. 1690.2 respectively. In case of non-cooperative dairy household the average labour cost per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.1350.5, Rs.1416.2, Rs. 1460 and Rs. 1679 respectively. It can be concluded that, labour cost per milch animal increased with their farm size in both cases of co-operative & non-cooperative dairy household but it higher in case of co-operative dairy household compare to non-cooperative dairy household.

The overall average, gross income per milch animal during the year 2002-03 came to Rs. 15776.26 per annum. In case of co-operative dairy household average gross income per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs.15696.2, Rs.
16816.2, Rs. 19765.8 and Rs. 20857 respectively. In case of non-cooperative dairy household, average gross income per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 12445, Rs. 12896.65, Rs. 16936.65 and Rs. 17915.24 respectively. It can be concluded that, gross income *per milch animal* increased with their farm size of holding in both cases of co-operative & non-cooperative dairy household. It higher in case of co-operative dairy household compare to non-cooperative dairy household.

The overall average, gross income *per household* during the year 2002-03 came to Rs. 31683.98 per annum. In case of co-operative dairy household the average gross income per farmer of marginal farmer, small farmer, medium farmer and large farmer came to Rs.21451.47, Rs. 42601.04, Rs. 45461.34 and Rs. 62571 respectively. In case of non-cooperative dairy household the average gross income per farmer of marginal farmer, small farmer, medium farmer and large farmer came to Rs.18667.5, Rs.34391.07, Rs. 38954.29 and Rs. 57328.8 respectively. It can be concluded that, gross income per farmer increased with their farm size in both cases of co-operative & non-cooperative dairy household. It higher in case of co-operative dairy household compare to non-cooperative dairy household.

The overall average, the net return from dairy *per milch animal* during the year 2002-03 came to Rs. 5875.91 per annum. In case of co-operative dairy household average net return from dairy per milch animal of marginal farmer, small farmer, medium farmer and large farmer came
to Rs. 6246.2, Rs. 6671.2, Rs. 7905.8 and Rs. 8337 respectively. In case of non-cooperative dairy household, average net return from dairy per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 4245, Rs.4401.65, Rs. 5821.65 and Rs. 6165.24 respectively. It can be concluded that, net return from dairy per milch animal increased with their farm size in both cases of co-operative & non-cooperative dairy household but it more in case of co-operative dairy household compare to non-cooperative dairy household.

The overall average, net return from dairy per household during the year 2002-03 came to Rs. 11800.77 per annum. In case of co-operative dairy household the average net return from dairy per farmer of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 8536.47, Rs.16900.37, Rs. 18183.34 and Rs. 25011 respectively. In case of non-cooperative dairy household the average net return from dairy per farmer of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 6367.5, Rs. 11737.74, Rs. 13389.79 and Rs. 19728.8 respectively. It can be concluded that, net return from dairy per farmer increased with their farm size in both cases of co-operative & non-cooperative dairy household but it higher in case of co-operative dairy household compare to non-cooperative dairy household.

The overall average, the gross margin *per milch animal* during the year 2002-03 was came to Rs. 12009.57 per annum. In case of co-operative & non-co-operative dairy household, the all-average gross margin per milch animal was came to Rs. 13568.60 & Rs. 10538.54
respectively per annum. It can be concluded that, gross margin per milch animal was increased with their farm size of holding in both cases of co-operative & non-cooperative dairy household. It higher in case of co-operative dairy household compare to non-co-operative dairy household.

The overall average, input-output ratio per milch animal during the year 2002-03 came to Rs. 1.593. In case of co-operative dairy household input-output ratio per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 1.661, Rs. 1.657, Rs. 1.666 and Rs. 1.666 respectively. In case of non-co-operative dairy household, input-output ratio per milch animal of marginal farmer, small farmer, medium farmer and large farmer came to Rs. 1.518, Rs. 1.518, Rs. 1.524 and Rs. 1.525 respectively. It can be concluded that, input – output ratio was higher in case of co-operative dairy household compared to non-co-operative dairy household.

**CONCLUSION**

1. The overall average, the proportion of various category of dairy household of marginal farmer, small farmer, medium farmer and large farmer came to 60 (50.00 percent), 30 (25.00 percent), 20 (16.67 percent) and 10 (8.33 percent) respectively.

2. The average size of family was small in case of co-operative dairy household compare to non-co-operative dairy households.
3. The sex ratio came to low in both case of co-operative & non-cooperative dairy household in compare to National sex ratio i.e. 933.

4. The average participation of women in different dairy activities decrease with their farm size in both case of co-operative dairy household & non-cooperative dairy household.

5. With regard to time spent, the result of the present study indicates that maximum time was spent in weeding (236.46 hrs/year) followed by harvesting (132.31 hrs/year), sowing (75.04 hrs/year) and manuring (60.53 hrs/year).

6. The study revealed that average literacy rate was high in case of male in compare to female. Average literacy increased with their farm size in both cases of co-operative & non-cooperative dairy households. In case of non-co-operative dairy households average literacy rate was increased at lower rate compare to co-operative dairy households.

7. It can be concluded that, maximum literate family member was group 1st (Up to 5th) followed by group 2nd (5th to 10th) and group 3rd (above 10th). The women literacy percentage was low comparing to man.
8. The majority of the farmer marginal farmers followed by small farmers both of farmers were 75 percent of the total no. of dairy household.

9. As a result that, the land holding increased in both cases of co-operative & non-cooperative dairy household with there farm size.

10. It can be conclude that majority of the dairy household was belong to SC / ST followed by OBC and General.

11. Thus, proportionately more no. of buffaloes in comparison to cow were maintained by the dairy households. The studies further conclude that proportion of buffaloes in the milch animal was comparatively higher in case of co-operative dairy households.

12. The study revealed that per milch animal value was higher in case of co-operative cooperative dairy household and it increased in both cases with the size of holding.

13. It can be concluded that, milk production per milch animal was higher in case of co-operative dairy household and it increased with their farm size in both cases co-operative & non-co-operative dairy households.

14. It can be concluded that, milk production per household was higher in case of co-operative dairy household and it increased with their
farm size in both cases co-operative & non-co-operative dairy households.

15. The study revealed that, the average milk production, consumption and marketed surplus increased with their farm size in both cases co-operative & non-co-operative dairy household the average milk production, consumption and marketed surplus was higher in case of co-operative dairy household in compare to non-co-operative dairy household.

16. It can be concluded that, highest milk production was came during winter season followed by rainy season and lowest milk production came during in summer season in both cases of co-operative & non-cooperative dairy household.

17. It can be concluded that, highest milk production came in winter season followed by rainy season and the lowest milk production in summer season in both cases of co-operative & non-cooperative dairy household.

18. It can be conclude that milk production per litres more and less it in all cases different category of dairy households.

19. A perusal of the table distribution of milk marketing agencies per farmer revealed that Channel 4th was more efficient in compares to
others. The table further reveals that 1st, 2nd and 3rd Channels more or less equally efficient.

20. It can be concluded that, maintenance cost per milch animal increased in both cases of co-operative & non-cooperative dairy household with their farm size. The table further revealed that maintenance cost came higher in case of co-operative dairy household.

21. It can be concluded that, maintenance cost per household increased in both cases of co-operative & non-cooperative dairy household while higher maintenance cost in case of co-operative dairy household compare to non-cooperative dairy households.

22. It can be concluded that, net-maintenance cost per milch animal increased with their land holding in both cases of co-operative & non-cooperative dairy household but it higher in case of co-operative dairy household than non-cooperative dairy household.

23. It can be concluded that, net-maintenance cost per household increased in both cases of co-operative & non-cooperative dairy household but it higher in case of co-operative dairy household than non-cooperative dairy household.

24. It can be concluded that, variable cost per milch animal increased with their size of holding in both cases of co-operative & non-
cooperative dairy households. It came higher in case of co-operative
dairy household in compare to non-cooperative dairy household.

25. It can be concluded that, fixed cost *per milch animal* increased with
their farm size in both cases of co-operative & non-cooperative
dairy household but it higher in case of co-operative dairy
household in compare to non-cooperative dairy household.

26. The study revealed that, feed cost *per milch animal* increased with
their farm size of holding in both cases of co-operative & non-
cooperative dairy household.

27. It can be concluded that, labour cost *per milch animal* increased
with their farm size in both cases of co-operative & non-cooperative
dairy household but it higher in case of co-operative dairy
household compare to non-cooperative dairy household.

28. It can be concluded that, gross income *per milch animal* increased
with their farm size of holding in both cases of co-operative & non-
cooperative dairy household. It higher in case of co-operative dairy
household compare to non-cooperative dairy household.

29. It can be concluded that, gross income *per household* increased
with their farm size in both cases of co-operative & non-cooperative
dairy household. It higher in case of co-operative dairy household
compare to non-cooperative dairy household.
30. It can be concluded that, net return from dairy *per milch animal* increased with their farm size in both cases of co-operative & non-cooperative dairy household but it more in case of co-operative dairy household compare to non-cooperative dairy household.

31. It can be concluded that, net return from dairy *per household* increased with their farm size in both cases of co-operative & non-cooperative dairy household but it higher in case of co-operative dairy household compare to non-cooperative dairy household.

32. It can be concluded that, gross margin *per milch animal* was increased with their farm size of holding in both cases of co-operative & non-cooperative dairy household. It higher in case of co-operative dairy household compare to non-cooperative dairy household.

33. It can be concluded that, input – output ratio was higher in case of co-operative dairy household compared to non-co-operative dairy household.