

**An economic analysis of costs and returns buffalo  
milk production in Gwalior District of Madhya Pradesh**

**THESIS**



***Submitted to the***

**RajmataVijayarajeScindia Krishi Vishwa VidyalayaGwalior**

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**MASTER OF SCIENCE**

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*by*

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## CERTIFICATE – I

*This is to certify that the thesis entitled, “An economic analysis of costs and returns of buffalo milk production in Gwalior District of Madhya Pradesh”* submitted in partial fulfilment of the requirements for the degree of **MASTER OF SCIENCE** in Department of **Agriculture Economics** of Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior is a record of the bona-fide research work carried out by **SANDEEP SHARMA** under my guidance and supervision. The subject of the thesis has been approved by Student’s Advisory Committee and the Director of Instructions.

No part of the thesis has been submitted for any degree or diploma or has been published. All the assistance and help received during the course of investigation has been acknowledged by the scholar.

Place: Gwalior

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*This is to certify that thesis the entitled “An economic analysis of costs and returns of buffalo milk production in Gwalior District of Madhya Pradesh” Submitted by SANDEEP SHARMA to the Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwaliorin partial fulfilment of the requirements for the degree of MASTER OF SCIENCE in Agriculture in the Department of Agricultural Economics has been accepted after evaluation by the external examiner and approved by the Student’s Advisory Committee after an oral examination of the same.*

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Place: Gwalior

Date: .../.../2020

**(Sandeep Sharma)**

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## **Chapter – I**

### **INTRODUCTION**

Indian Agriculture has been the main stay of Indian economy as 64 per cent of the population depends on it. This sector plays a crucial role in the economic development of the country. At present Agriculture and allied sector contribute nearly 16.5 percent of country's GDP at 2019-20. One of the most significant changes in India's agricultural economy over the past three and half decades has been the rising contribution of livestock sector in the agricultural gross domestic product (Ag.GDP). Between 1970 and 2020, the share of livestock has risen from 17 per cent to 25.6% of total Agriculture GDP. Dairying accounts for more than two-third of the livestock output and is largely responsible for the rising importance of the livestock sector in the country. India has emerged as the world's largest milk producer and milk producing continues to grow at a fairly high rate. Despite livestock forms an integral part of rural India. Farmers not only produce food grains but also manage Livestock. Farmer's income, agriculture and rural economy are heavily dependent on livestock. Infect livestock is a major instrument of production of small farmers. India has the largest cattle population in the world. Almost every rural household in India, whether landed or landless, owns livestock. Dairying in India occupies a prominent place in rural life and provides not only subsidiary occupation and nutritional standards but is also a source of organic manures and draught power. Livestock sector contributes about 4.11 per cent of the total GDP and 25.6 per cent of the agricultural GDP in the year 2008-09. Milk is an important commodity not only as a source of dairy industrial raw material but also a nutritive food for the people. Milk has been considered nearly a complete food for the infants and growing children. India continues to be the largest producer of milk in the world. The estimate of the milk production in 2017-18 is 176.30 million ton year. The total meat production from cattle, buffalo, sheep, goat, pig and poultry is estimated to be 7.70Mt, egg production is 95217 million Nos. India has the distinction of being the largest producer of milk in the world with production level of 187.74 million tonnes (MT) in 2018-19. USA stands second with the production level of

98.72 MT, and Pakistan third with 45.79 MT in 2018-19. India's share in world milk production is 22.29 per cent in 2018-19, as compared to USA of 11.71 per cent, and Pakistan of 5.43 per cent. Compound Annual Growth Rate (CAGR) for milk production works out to 5.1 per cent for China and 4.2 per cent for India. Per capita availability of milk in the country is 290 gms per day compared to the world average in 2011 of 289 gms per day. Average annual growth rate of milk production for India in the recent years has been 4.2 per cent compared to the world production average of 2.3 per cent. Growth in recent years has been faster compared to the earlier decades in India. It has touched 5 per cent in, and declined to 3.5 per cent. Average annual growth rate in per capita availability of milk for India has been around 3 per cent in the recent years, faster than in earlier years ([www.nddb.org/statistics](http://www.nddb.org/statistics)).

With all India milk production in 2018 as 187.74 MT, the contribution of leading States is as follows. Arranged in the descending order of milk production in 2018-19, the position of 13 major States with production in MT, and percentage share given in parentheses is as follows: Uttar Pradesh 30.51, Rajasthan 23.66, Composite Andhra Pradesh 15.04 and Telangana States 5.40, Gujarat 14.49, Punjab 12.59, Madhya Pradesh 15.9, Maharashtra 11.65, Haryana 10.72, Tamil Nadu 8.36, Bihar 9.81, Karnataka 7.90, and West Bengal 5.60.

Indian Arid zone, where livestock rearing is generally main occupation of rural masses, consists of 12 per cent of country's geographical area and 61 per cent of India's arid zone is Rajasthan. Climate of this zone is not suitable for crop rising. Annual rainfall here is below 300 mm per year, that too irregular during monsoon season, which often leads to wide spread drought conditions. The milk production is influenced to a great extent by the feeding pattern, the quality of feed and the ingredients in the feed. The feeds and fodder accounts for 50 to 75 per cent of the total cost depending upon the condition under which the milch animals are kept for milk production. Buffaloes are the largest genetic resource found in large numbers in a number of States, and form an important component of the livelihood of rural masses.

Feed consists of green fodder, including pasture grass and tree lopping, dry fodder, concentrates and balanced cattle feed. During the 1950s and 1960s, India was one of the largest importers of dairy products, importing over 40 per

cent of milk solids in dairy industry. The commercial import of milk powder reached its peak at about 53 thousand tonnes in 1963-64 (Kannitkar, 1999). This caused alarm to policy makers and a decision was made to achieve self-sufficiency in milk production. The major step forward, came in mid-sixties with the establishment of the National Dairy Development Board (NDDB) to see over dairy development in the country. The Operation Flood Program, one of the world's largest and most successful dairy development programmes, Operation Flood was launched in 1970. Its main thrust was to organize farmers' cooperatives in rural areas and link them with urban consumers. Operation Flood has led to the modernization of India's dairy sector and has created a strong network for procurement, processing and distribution of milk by the cooperative sector. In 1989, the Government of India launched the Technology Mission on Dairy Development (TMDD) program to support and supplement the efforts of Operation Flood and to enhance rural employment opportunities and income generation through dairying. There are large inter-regional and inter-state variations in milk production as well as per capita availability in India. About two-third of national milk production comes from Uttar Pradesh, Punjab, Rajasthan, Madhya Pradesh, Maharashtra, Gujarat, Andhra Pradesh and Haryana. However, there have been some shifts in milk production share of different states. In 2007-08, U.P. was the largest milk producer in the country with about 18.8 Mt of milk, followed by Rajasthan (9.95 Mt), Punjab (9.3 Mt), M.P. (6.1 Mt), Maharashtra (6.0 Mt) and Gujarat (5.6 Mt). Major milk producing regions in country have good resource endowment and infrastructure. The eastern region is lagging behind in term of dairy development. The average per capita availability of milk during 2007-08 was highest in Punjab (962 g per day), followed by Haryana (632 g per day), Rajasthan (408 g per day). The average per capita consumption of milk and dairy product is lowest in rural areas than in urban areas, even though milk is provide by rural areas. Rajasthan state occupies third rank (9.49 Mt) next only to Uttar Pradesh and Andhra Pradesh in milk production in the country and fourth rank (399 g per day) next only to Punjab, Haryana and Gujarat in per capita per day milk availability in 2008-09. The state has 6.6 per cent of cows and 7.18 per cent

of buffaloes of the total in the country and contributes about 9 per cent of the total milk production.

Well India stands first, USA stands second in the world in milk production. India constitutes in milk production, accounting for 21 per cent of world production. During 2017-18, milk production peaked at 176.3 million tonnes and per capita availability of milk 375 gms/day. (Department of Animal Husbandry, Dairying & Fisheries Ministry of Agriculture, Government of India, New Delhi) Looking at the importance of the dairy sector and global demand for livestock product it is necessary to measure know the economics of milk production. There are large inter-regional and interstate variations in milk production as well as per capita availability in India. About two-thirds of national milk production comes from Uttar Pradesh, Punjab, Rajasthan, Madhya Pradesh, Maharashtra, Gujarat, Andhra Pradesh, and Haryana. However, there have been some shifts in milk production share of different states. In 2017-18, U.P. was the largest milk producer in the country with about 25.60 million tonnes of milk, followed by Rajasthan (10.26 million tonnes), Punjab (10.1million tonnes), M.P. (8.80 million tonnes), Maharashtra (6.57 million tonnes), and Gujarat (5.60 million tonnes). Animal husbandry in Madhya Pradesh is no exception to trend in the country. Dairying in the state has progressed very fast after the White Revolution.

Madhya Pradesh ranks 3rd in milk production and contributing 6.3 per cent to the total milk production in the country. Total milk production of state was found to 14713 thousand ton in 2017-18 and per capita availability of milk 505 gm per day. Madhya Pradesh comprises of 51 districts in which Gwalior district will be selected for present study due to Gwalior second largest producer of milk in Madhya Pradesh. While Gwalior district stands the second rank in milk production and 7<sup>th</sup> rank in livestock population among all the district of Madhya Pradesh. (Department of Animal Husbandry and Dairying Ministry of Agriculture, Government of Madhya Pradesh) Commercial dairy farming became very popular in the nearby city of the state (Sharma, 2013). The Operation Flood Programmed, which is the world's largest integrated dairy development programmed has made considerable progress in achieving its outlined objectives.

**Objectives:**

1. To work out the cost and return of buffalo milk production in the study area.
2. To study the pattern of marketing of milk, marketing channels, price spread and marketing efficiency of milk.
3. To determine the factors affecting of the milk production.
4. To identified the constraints of commercial buffalo entrepreneurs.

**Significance of the study:**

Currently, livestock production is one of the fastest growing enterprises in the prospering economy of the nation as well as in the Madhya Pradesh also. the rate of growth has doubled. i.e. nearby 4 per cent as compared to agri business sector only 2.1 per cent (Singh 2012). For faster progress of dairy business it is important to estimation the level of profitability from milk production because milk production is the main aim of dairy growers in the state.

Cost of milk production and returns from dairying constitute an significant feature in showing its economic feasibility. It is a serious economic indicator for policy makers, milk producers, consumers and in order to provide an significant relation between the milk producers and consumers for fixing the price of milk sensibly. Usually, a milk producer can raise his dairy income in two ways like increasing the milk production or by decreasing cost of milk production. Cost of milk production mostly becomes a policy issue, when milk producers complain that the price of milk they are receiving does not cover the cost of milk production. On the other side, marketing of milk is one of the significant aspects for profitability of milk production. So, an attempt has been made in the present study to estimate the cost of milk production and economics of milk marketing.

Singh, Khumbongmayum Rishikanta (2012). Economic impact of integrated dairy development project on rural households in Meghalaya State. *Ph.D Thesis Submitted to the National Dairy Research Institute, Karnal.*

**Limitation of the study:**

Although best efforts during the data collection for obvious reasons the study might have some limitations as indicated below.

- i. As proper farm records are not maintained by the dairy farmers in the study area, the data collected by personal interview method relied on their memory and past experience. However, every effort was made to gather information as accurate as possible, yet the errors in eliciting the information from the memory of respondents could not be ruled out.
- ii. This study is based on the data collected for one year only. These results are valid for the input-output prices and technology prevailing in that year. With the dynamics of factor-product prices and technology, the results have to be interpreted with caution.
- iii. This is purely a micro-economic study and findings of the study would be confined only to area under consideration. However, the results can be emulated in other areas under similar agro-ecological-economical conditions.

## Chapter – II

### REVIEW OF LITERATURE

Mangesh (2003) studied the economics of milk production in Wardha district of Maharashtra and reported that the average maintenance cost per day per animal was Rs.29.53, Rs.38.58 and Rs.37.63 for local cow, crossbred cow and buffalo, respectively. Total feed cost accounted for about 76.57, 72.11 and 76.53 per cent of gross cost for local cows, crossbred cows and buffaloes respectively, whereas total variable cost accounted for about 93.03, 87.80 and 89.32 per cent of gross cost for local cows, crossbred cows and buffaloes, respectively.

Baweja (2004) carried out an economic analysis of production and marketing of milk in Udaipur district of Rajasthan. The study revealed that net maintenance cost of milk production per day on small, medium and large size groups was Rs.34.30, Rs.32.34 and Rs.30.94 for milch cows and Rs.44.03, Rs.42.38 and Rs.41.06 for milch buffaloes, respectively. The cost of feeds and fodder were the major item of total cost accounting for about 78 per cent in milch cows and about 81 per cent in milch buffaloes. The net maintenance cost of milch cows and buffaloes decreased with the increase in herd size categories.

Das (2004) conducted a study on economic efficiency of milk production and marketed surplus in rural areas of Burdwan district (West Bengal) and reported that the per day maintenance cost of buffalo, crossbred and local cow was Rs.35.20, Rs.40.12 and Rs.22.28, respectively. The cost of feeds and fodder was the major item of total cost accounting for about 67 per cent in buffaloes, 69 per cent in crossbred cows and 68 per cent in local cows. The per liter cost of milk production was highest for local cows (Rs.14.85), followed by buffaloes (Rs.11.94) and crossbred cows (Rs.8.61).

Aitawadeet *al.* (2005) studied economics of milk production from crossbred cows in Akola district of Maharashtra state and observed that the total maintenance cost per animal per annum was Rs.18,020.24, Rs.19,851.69 and Rs.20,026.13 in small, medium and large size of land holding, respectively. In the total cost, the variable cost was a major item of

the total cost, accounting for 90.35 per cent and fixed cost for 9.65 per cent. The cost of feeds and fodder was the major cost item, which constituted 65.77 per cent of the total cost, followed by upkeep charges (12.79%), interest on working capital (10.40%). It was observed that the total maintenance cost increased with the increase in size of land holding. The per liter cost of milk production was observed to be Rs.5.98, Rs.5.44 and Rs.5.82 in small, medium and large size of land holding, respectively.

Bardhan *et al.* (2005) studied economics of milk production from crossbred cows in Udham Singh Nagar district of Uttaranchal and reported that total cost of maintaining a cow and average cost of milk production were found to be Rs.21,862.89 per annum and Rs.9.78 per liter, respectively. The study revealed no particular trend between the size of land holding and total cost, while per liter cost of milk showed a declining trend with increase in size of land holding. The season-wise analysis indicated that the average maintenance cost of a cow was highest in winter season, followed by summer and rainy seasons. This was because of the greater expenditures made in feeding of the dairy animals in winter season on account of adequate availability of feed and fodders.

Dwaipayana *et al.* (2005) conducted a study in the Tarai area of the newly created state of Uttaranchal, India, to analyze the economics of buffalo milk production for different categories of farmers in different seasons. Study reported that larger farmers incurred the highest expenditures (Rs.21054) in maintenance of their animals. The lowest expenditures were made by the marginal category of farmers (Rs.17071). Net returns over total cost were negative for all the categories of the farmers, except marginal farmers. Average net loss in the study area was Rs.795. However, family labour income was positive for all categories of farmers. These findings indicate that rearing of buffaloes for milk purpose is non-remunerative and unprofitable proposition in the study area. Some policies suggestions were made to overcome some of the constraints towards profitable milk production.

Bhardwaj *et al.* (2006) conducted a study in four adopted villages of Central Institute of Research on Buffaloes, Hissar (Haryana). Feed cost was found to be a major component accounting as high as 71 to 76 per cent of the total maintenance cost of milch buffaloes. The net maintenance cost per day

per buffalo for small, medium and large farms was worked out to be Rs.57, Rs. 63.80, and Rs.64.30, respectively. The corresponding figures for net gross returns and net profit per day per buffalo were Rs.65.80, Rs.71.02 and Rs.73.16 and Rs.11.50, Rs.7.22 and Rs. 8.86 respectively. The break-even output for milk production worked out for small, medium and large categories were 5.00, 5.56 and 5.56 liters per day respectively. It was found that break even output was achieved much earlier on small herd size farms as compared to medium and large farms.

Sirohiet *al.* (2007) in their study on "Economics of milk production: Variation across Productivity Levels" reported that the average daily maintenance cost ranged from Rs.62 for crossbred cow of average 7 liters productivity to Rs.97 for high producing animal, yielding nearly 24 liters per day. The feed cost increased from Rs.43 to Rs.48 for increase in average productivity from 7 to 12 liters/day, respectively. The net profit margin per cow was estimated to be 9 per cent for milch animals and 35 per cent for the lactating animals. In case of buffaloes, the average daily maintenance cost ranged from Rs.43.50 for a buffalo producing about 3.6 liters of milk, to Rs.62 for the animal with average daily yield of 11.5 liters. The average daily cost was Rs.52 over the three productivity ranges and about 7 per cent lower (Rs.48) for milch animals.

Singh (2008) in his study on "Economic analysis of milk production in Vanarasi district of Uttar Pradesh" reported that overall daily net maintenance cost per milch buffalo was Rs.47.37, and per milch cow was Rs.35.99. The feed cost constituted about 79 per cent of gross cost. Overall net cost of milk production for milch buffalo was Rs.13.27 per litre and it was Rs.15.78 per litre for milch cows. Net return from milking buffalo was Rs.1.05, which was highest (Rs.9.60) for large and lowest (Rs.0.73) for landless, whereas negative return was incurred in small and medium category. The net returns per milch buffalo were found negative for all the categories except for marginal category. Net return from cow milk production was found negative which may be due to inadequate number of observation.

Mahajan (2010) conducted a study to analyze the economics of Rural and Peri-urban Dairy Farms in Ludhiana District of Punjab. The study found that the annual daily net maintenance cost per milking buffalo on rural and

peri-urban dairy farms was Rs.141.10 and Rs.151.06, respectively. The corresponding net returns per milking buffalo were Rs.53.33 and Rs.111.26, respectively. The net returns were much higher for milch buffaloes on peri-urban farms. The annual daily net maintenance cost per milking crossbred cattle on rural and peri-urban dairy farms were Rs.145.18 and Rs.155.61, respectively. The corresponding net returns per milking crossbred cattle were Rs.53.87 and Rs.137.36 respectively. The net returns were much higher for milch crossbred cattle on peri-urban farms. The net returns per milking and milch animal were higher in case of crossbred cattle as compared to buffalo in all seasons.

Singh (2012) reported that the per day average net maintenance cost of a milch crossbred cow was slightly lower in member group (Rs.121.84) as compared to non-member (Rs.123.62). This was due to the fact that member milk producers adopted better feeding and management practices. The sizable portion of the total cost (80 and 82 per cent) was accounted for by the feed cost followed by labour cost (7 and 9 per cent). It was observed that the per cent share of feed cost increased with the increase in herd size categories while the labour cost decreased with the increase in herd size categories in both groups.

Patidar (2016) reported that the total average cost per dairy unit, per annum found to Rs.160943 while, the total average cost per milch animal, per annum found to Rs.16094.3.

### **2.1 Cost of milk production:**

Priyadarshini C Gadad and Dr. SM Mundinamani(2018) studied to assess the economic analysis of milk production by dairy entrepreneurs of Vijayapura Milk union district. Multistage sampling procedure was followed for selection of 80 sample member and non-member dairy farmers. The data pertained to the agricultural year 2017-18. Budgeting technique were used to analyze the data. The per year total variable cost incurred by member of Milk cooperative societies in production of milk from buffalo, crossbreed cow and indigenous cow was ₹ 24959.93, ₹ 31982.00 and ₹ 19714.40 respectively and ₹ 20761.38, ₹ 27396.87 and ₹ 17383.77 for non-member dairy entrepreneurs. The major fixed cost of dairy farm is depreciation on dairy animals and building. The cost of depreciation on crossbreed cow was found more in both

member (₹ 5675.20) and non-member dairy farmer's (₹ 5178.00) compared to depreciation on building and machinery. The total cost incurred on buffalo, crossbreed cow and indigenous cow by member dairy farmers was ₹ 31322.78, ₹ 40882.00 and ₹ 24482.60 respectively and ₹ 26913.06, ₹ 35450.58 and ₹ 20781.73 by non-member dairy farmer. The gross return obtained by member farmers was ₹ 55156.80, ₹ 73236.65 and ₹ 38485.30 from buffalo, crossbreed cow and indigenous cow respectively, similarly for non-member farmers the gross returns was ₹ 40443.24, ₹ 59890.60 and ₹ 30495.70 per animal per year. Returns from sale of milk contributed the maximum share. The B: C ratio was calculated for both member and non-member dairy farmers and it was found that B: C ratio of buffalo, crossbreed cow and indigenous cow was 1.76, 1.79 and 1.57 respectively and it was 1.50, 1.68 and 1.46 for non-member farmers. Since B.C ratio in case of member farmers was higher compared to non-member farmers, the impact of milk union on the dairy entrepreneurs is a profitable venture and has positive influence on the standard of living and economic status of the farming community in the study area.

Kumar and Gupta (1988) studied the cost of milk production of different categories of milk producers for buffalo, local cow and crossbred cow in different seasons in Muzaffar nagger district of Uttar Pradesh. The study revealed that the per liter cost of milk production from buffalo, local cow and crossbred cow worked out to Rs.2.34, Rs.1.83, respectively. Thus the per liter cost of milk production was the lowest in the case of crossbred cow on account of its highest milk yield among the three species of milch animals which proves its economics superiority over the others.

Goswami and Rao (1992) conducted a study on economics of milk production in the East-Khasi Hills district of Meghalaya during 1988-89 and observed that total cost of milk production per milch animal for cow was Rs.2,108.24, Rs.2,381.48, Rs.2,749.81, Rs.3,410.90 and Rs.3,524.37 per annum on marginal, small, semi-medium, medium and large farmers, respectively. The net cost of milk production per milch animal for cow was Rs.1,760.74, Rs.1,994.69, Rs.2,355.44, Rs.2,989.55 and Rs.3,065.68 per annum on marginal, small, semi-medium, medium and large farmers, respectively. The per liter cost of milk production for cow was Rs.2.92,

Rs.2.89, Rs.2.80, Rs.2.74 and Rs.2.46 on marginal, small, semi-medium, medium and large farmers, respectively. They found that the total cost and net cost of milk production per cow increased with increase in size of land holdings, whereas per liter cost of milk production decreased with increase in size of land holdings.

Gouraha (1995) studied the cost structure, pattern of disposal and relative economics of milk production of the urban and rural dairies, in Raipur district of Madhya Pradesh. The study brought out that average daily expenditure incurred on a milch animal was higher in the urban area than in rural area due to higher portion of concentrate and green fodder fed to animal and higher cost of feed and fodder which accounted for nearly 68 per cent of the total cost. The average cost of production of per liter of milk for crossbred cow came to Rs.5.44 and Rs.5.16 in the urban and rural areas, respectively while the corresponding figures for a buffalo marked out to Rs.6.32 and Rs.6.33, although not much difference in the cost of production of milk in both the areas was observed. The net returns were Rs.3.84 and Rs.4.68 per liter in the case of crossbred cow and buffalo milk respectively in the urban area. These were, however, Rs.2.55 and Rs.3.67 per liter crossbred cow and buffalo milk in the rural area. A loss of Rs.2.13 per liter was reported in the case of local cow milk in the rural dairies. The negative returns per liter of for local cow were due to lower milk yield. The per day per animal yield of milk was higher in crossbred cow than in buffalo in both the areas.

Diwakar and Binod (1995) revealed that the cost of production of cow milk on cost A basis worked out to Rs.3.87, Rs.5.20, and Rs.3.24 per liter, respectively in size –class I, size –class II and size -class III (more than 10 cow households). Further, the total cost of production per liter of milk in the corresponding three size classes of dairy farm were Rs.6.39, Rs.7.87 and Rs.5.67.

Baruah *et al.* (1996) reported that the cost of production per liter of milk were observed to be Rs.8.47, Rs.8.23, Rs.8.28, Rs.8.08, in less than 4, 4-6, 7-9, 10-12, and more than 12 animal unit sizes, respectively.

Singh and Rai (1998) conducted a study at Haryana Agriculture University, Hissar to compare the economics of keeping buffaloes versus crossbred cows under mixed farming conditions. For the units with three cows

and three buffaloes, the mean annual expenditure was Rs.26692/- and Rs.27800/- respectively. Income was from sale of milk was Rs.34897/- and Rs.24578/- while net income was Rs.18433/- and Rs. 9315/- for a unit of three cows and three buffalos, respectively. The annual income per 100 rupees invested was Rs.69.05 and Rs.33.50 for cow and buffalo respectively indicating crossbred cow keeping was more profitable.

Atkareet *al.* (2002) studied on factors affecting the cost of milk production. Such as the cost of feeds, labor, supervision and health coverage, were studied. Data on 30 crossbred cows (Gir x Jersey, Sahiwial x Jersey, and Sahiwal x Holstein-Friesian), Maintained at a farm in Maharashtra, India. Covering the period 1998-99, was used. On wet basis, the average gross cost of milk production per liter was Rs.7.08 and Rs.8.07; and Rs.6.85 and Rs.8.13; and Rs.6.73 and Rs.7.83, respectively, during the rainy, winter and summer seasons for the year 1998 and 1999. The corresponding values for net cost were Rs.6.86 and Rs.7.83; Rs.6.63 and Rs.7.89; and Rs.6.53 and Rs.6.62, respectively. The average gross cost of milk production on held basis was Rs.9.07 and Rs.9.08; Rs.9.05; Rs.9.37; and Rs.9.24 and Rs.8.89, respectively during the rainy, winter and summer season of the years 1998 and 1999.

Rautet *al.* (2005) conducted a study in Bangalore district at different levels of production. The average total cost of milk production of cross bred cow per day was Rs.71.76, fixed cost and variable cost accounting for Rs.6.49 and 93.51% of total cost respectively. Feed and labor cost accounted for more than 90% at all levels of production. The average cost per liter of milk at below 6 liter level of production worked out to Rs.9.51, leaving a small margin of profit. It was apparent that the returns over cost at below 6 liters milk yield level is an uneconomic proposition at the current prices offered by the dairy co-operative society.

Singh (2006) in his study on economics of milk production and marketed surplus in Imphal district of Manipur observed the per litre cost of milk production at Rs.13.09 and Rs.16.70, for crossbred cow and local cow respectively. Total variable cost accounted for about 82 per cent of gross maintenance cost. Net return from milk production was as low as Rs.1.0 for crossbred cow while in local cow it was negative.

Ghule (2010) studied on economics of milk production and its disposal pattern on commercial dairy farms in Ahmednagar district of Maharashtra. The study was based on primary data collected from sample households through interview method. The study implied that the cost per liter of milk worked out to Rs.9.41, Rs.9.42 and Rs.8.65 for crossbred lactating cattle on small, medium and large farm respectively and that of milch cattle was Rs.12.49, Rs.12.58 and Rs.11.48. The net returns per liter of milk in case of lactating crossbred cattle were found to be Rs.4.65, Rs.4.53 and Rs.6.14 on small, medium and large commercial farms respectively. The corresponding figures for milch cattle were Rs.1.57, Rs.1.36 and Rs.3.30. In case of lactating buffalo, cost per liter of milk was Rs.14.38 and for milch buffalo was Rs. 26.78.

Thakur (2010) made an attempt to study the economics of milk production and marketing of milk in Samastipur district of Bihar. The data was collected from the sample households on well-structured schedule by personal interview method. It was concluded from the study that the cost of producing a liter of milk was Rs.17.13, Rs.12.88 and Rs.14.05 for buffaloes, crossbred cows and local cows respectively. The higher cost of milk production in case of buffalo could mainly be attributed to the higher feed and fodder expenditure.

Khoveio (2011) studied economics of milk production, marketed surplus and its disposal pattern in Nagaland found that average net maintenance costs per day for crossbred and local milch cows were worked out to be Rs.85.96 and Rs.42.40 respectively. The average cost per liter of milk production for crossbred and local milch cows were worked out to be Rs.19.58 and Rs.29.08 respectively. The net return was found to be positive for crossbred cows while it was negative for local cows across all the herd size categories of household.

Nagrle (2011) studied economics of milk production in Vidarbha region of Maharashtra and found that the overall cost per liter of milk production for milking local cow was worked to be Rs.21.90 and for marginal, small, medium and large categories was Rs.22.90, Rs.22.43, Rs.20.96, Rs.20.91 respectively. Overall net return was found to be Rs.- 0.24 and for marginal, small, medium and large categories was Rs.-1.60, Rs.-0.83,

Rs.0.89 and Rs.1.59 respectively. Cost per liter of milking crossbred cow was worked to be Rs.12.90 and for marginal, small, medium and large categories respectively with an overall average of Rs.12.24 per liter. Net return per liter was found to be Rs.4.74, Rs.5.34, Rs.5.48, and Rs.5.75 with overall average of Rs.5.10 respectively.

Singh *et al.* (2011) studied economic analysis of milk production and disposal pattern of milk in Varanasi district of Uttar Pradesh. A tabular analysis was carried to work out the cost and returns from the milk production and producers surplus of milk. On an average, a milking buffalo produced 4.15 liters of milk per day, which was highest (5.12 liters) for large and lowest (3.62 liters) for small category and a milking cow produced 3.03 liters of milk per day, which was highest (4.0 liters) for small and lowest (2.16 liters) for marginal category. Overall net returns from milking buffalo were found to be Rs.1.05 per day. Marketed surplus accounted for 54 per cent of total milk produced.

Singh (2012) reported that per liter cost of milk production revealed that the overall cost per liter of milk production was Rs.17.51 for members as against Rs.20.20 for nonmembers. The overall average gross return, net return and return per liter of milk production were higher at Rs.136.35, Rs.14.51 and Rs.2.08 for member as compared to Rs.129.11, Rs.6.09 and Rs.1.00 for non-member group.

Vishnoi (2013) analyzed the economics of milk production in Nainital district of Uttarakhand. He found that in plain region, cost of milk production per liter of milk, for local cow, crossbred cow and buffalo was computed at Rs.27.61, Rs.19.17 and Rs.27.19 respectively. While in case of hill region, cost of milk production per liter of milk, for local cow, crossbred cow and buffalo was computed at Rs.26.47, Rs.9.23 and Rs.26.88 respectively.

Manjunatha (2014) reported that the cost of milk production per litre of milk, for crossbred cow and buffalo was computed at Rs 18.78 and Rs 28.77 respectively. Share of feed cost in the total cost varied from around 65.80% (Buff) to 69.60 % (CB).The share of labour cost ranged between 21.70% (Buff) to 15.73% (CB). The variable cost constituted about 91.50 % (Buff) 90.38 % (CB) of the gross cost, leaving the rest for fixed cost. The net return

was negative (Rs -2.77/lit) for the buffalo, while crossbred cows it was positive (Rs 5.21/ lit) net returns.

Sharif (2014) reported that the cost of milk production was highest in local cows (Rs.24.04 to 29.51/litre) followed by, buffaloes (Rs.22.19 to 26.34/litre) and crossbred cows (Rs.16.68 to 19.38/litre).

## **2.2 Pattern of marketing of milk, marketing channels, price spread and marketing efficiency of milk:**

Pawar and Sawant *et al.* (1995) examined the marketing efficiency of three channels - private, cooperative and government - in Western Maharashtra. Their results suggest that private dairies paid somewhat higher prices to the producers and still managed to supply milk to the consumer at competing prices. This was due to higher efficiency in procurement, processing, transportation and distribution.

Verma *et al.* (1997) conducted a study in Karnal town of Haryana to ascertain deterioration in milk quality during marketing and to estimate real margins in milk trade, it was reported that in the lean seasons milk supplied to consumers by producers directly was of better quality at an average price of Rs.5.68/- per liter than that was sold to Halwai and vendor at Rs.4.75/- and Rs.4.04/- per liter respectively.

Ray *et al.* (2000) conducted a study in Jaipur city reported that local milkmen supply fresh raw milk at the doorsteps or to the vendor who in turn supplies it to households. The prices varied from Rs.13-20 per liter for cow's milk depending on adulteration of milk with water and the category of customer. The price generally realized by small farmers from the local vendor was about Rs.10-12 per liter, whereas they got only about Rs.9-10 from the cooperatives. Some middlemen also deployed daily wage workers to collect milk by using bicycles, jeep or camel cart to collect milk from the doorstep and take it to different selling points in nearby major cities.

Sharma (2000) conducted an opinion survey in Andhra Pradesh regarding the consumer perception and attitude towards the different sources of milk purchase. It revealed that a majority of the families purchase milk from private vendors due to non-availability of Dairy milk within the reasonable distance from the consumer's residence. Several households reported that the housewives are unable to collect the milk in person from the milk booths as it

involves time and energy and they are forced to employ servants for collection of milk from the booths, which involves additional cost and delay. Further, they also expressed dissatisfaction with the present arrangement of milk supply from the booths and suggested home delivery. Nearly, 60 percent of the families felt that the home delivery of milk in polythene sachets is advantageous and indicated willingness to pay additional costs/service charges for the same. So, the co-operatives may have to seriously think about the system of home delivery of milk in order to bring more consumer families under its fold. Other reason for household preference to private vendor was non-availability of milk in small packing of less than half litre with the Dairy as several small families and those belonging to lower income groups strongly felt that such facility is essential to enable them to purchase the Dairy milk. It is also true with small size families irrespective of their economic status. Similarly, it was also noticed that in Orissa, a majority of higher income group (85.6%) were not purchasing OMFED milk due to absence of home delivery, poor taste, less cream, bad smell and non availability of credit structure in co-ops. There was also strong correlation between income and proportion of home delivered milk. For example, in Orissa, the percent of milk that was home delivered increased from 40 percent for those with income less than Rs.4,000 to 63 percent for those with income more than Rs.10,000.

Khareet *al.* (2003) of their opinion, Milk collection was higher in healthy season (from September to February) and lower in unhealthy season (from March to August). In spite of more production in the month of July and August, the producer members of the society were not in position to transport their product due to lack of all weather roads. As the distance of the milk producer's co-operative society increases from the dairy plant, the volume of milk collection decreases, the milk collection was higher in those societies, which are well connected to the dairy plant. The variable cost was the main component of cost of milk production and the maximum cost incurred in the purchase of feed and fodder and in labour management. Low price of milk was the most important problems in the collection of milk, followed by lack of cold storage, delay in payment, inadequate water for animals, lack of all weather roads, small quantity of marketable surplus of milk, improper

treatment, lack of cross breed animals and uncertainty of electricity. Hence, efforts should be made to solve all these constraints.

Sujatha *et al.* (2004) studied the market structure, price spread, marketing costs and marketing efficiency for milk in the cooperative and private sectors of Andhra Pradesh. It was found that price spread was less in private sector and hence the consumer price was also less. The major constraints identified in milk marketing were high feed cost, inadequate price for milk, poor credit facilities, disease outbreak, etc. Because of delay in the payment of fee for the milk sold to the cooperative society, the farmers approached the private firms. For enhancing the marketing efficiency of milk, infrastructure facilities like chilling plant, pasteurization and dairy products processing plants have to develop.

Reddy and Vasudev (2006) studied and an attempt has been made to quantify the level of consumption, production, and marketed surplus of milk in Karimnagar district of Andhra Pradesh. Better feeding followed by congenial weather conditions during the winter has positive effect on milk production. It was also interesting to note that in relative terms marketed surplus was more in summer (ranging from 58.5 percent to 60 percent) compared to that in rainy season (50 percent to 56 percent). On an average marketed surplus during the year ranged between 55 percent in the case of small farmers to 57.2 percent in the case of medium farmers. But in all the categories of farmers the consumption of milk was above recommended level i.e. 250 gm / day/person. With the disposal of marketed surplus of milk through different agencies it was evident that the co-operatives and milk vendors emerge as major procurement agencies (more than 70 percent) in all categories of farmers. Majority of the small and medium farmers preferred milk vendors while large farmers preferred milk co-operatives to sell their surplus milk. The large family size, education level of family had influenced the consumption pattern of milk. These lead to consume more, resulting in shrinkage of marketed surplus.

Sharma *et al.* (2007) of their opinion that India is the leading milk producer in the world and the dairy cooperatives are the backbone of Indian dairy industry. This study has analyzed the inefficiencies existing in improving milk production, procurement pattern, marketing channels, and price spread of a dairy cooperative, Uttaranchal Cooperative Dairy Federation Ltd

(UCDFL), also known as the Kumaun region of Uttarakhand and has proposed a model for eliminating these inefficiencies. It has been found that UCDFL is focused mainly on liquid milk marketing and has not adopted product diversification, which is the need of the day. Nainital and Almora districts of Kumaun region have been selected for the study; these cover almost 40 per cent of cattle population in the division, except Udham Singh Nagar. It has been found that due to insufficient margins, the number of agents working for other private dairies has increased. Different marketing channels for milk have been identified and price spread has been calculated for all the channels. Lack of business development services related to dairy industry has been found leading the farmers to disassociate from Anchal. The study has suggested that Anchal should evolve a definite policy with regard to procurement of milk in both lean and regular periods and to sustain its members, incentive package should be provided. Anchal should find ways to establish fodder banks at strategic locations for providing fodder during emergencies and periods of fodder scarcity. Local sale of milk at the society level should be encouraged to increase the popularity of Anchal brand.

Kamat (2008) has emphasized on the market-oriented dairy development. In his opinion it can alone ensure success of dairy units whether they are in public, private or co-operative sector. There is a great need to institutionalize milk trade from the stage of production to marketing.

Rangasamy and Dhaka (2008) analyzed the marketing of milk and milk products by dairy plants of co-operative and private sectors in Tamil Nadu and compared. The study is based on the data collected for toned milk, standardized milk, full cream milk, flavoured milk, butter and ghee from the selected co-operative and private dairy plants of the Coimbatore district for the financial year 2001-2002. It has been found that the marketing cost for toned milk is the same in both the dairy plants, whereas it is higher for standardized milk, full cream milk and flavoured milk in the co-operative dairy plant. The marketing cost has been found less in the cooperative plant for products like butter and ghee. All the dairy products earn more marketing margins in the private sector than in co-operative dairy plant, except for toned milk. The marketing efficiency of cooperative dairy plant for all dairy products has been observed relatively less than that of private dairy plant, except for

toned milk. The study has suggested the development of co-operative dairy industry in a sustainable manner, and the co-operative dairy plants should formulate long-term vision and strategy. The study has observed that value addition in dairy products should be done without compromising the quality and consumer-oriented market research and development should be accorded greater attention.

Yogi *et al.* (2008) conducted study in Jipur district of Rajasthan. The analysis of primary data collected from 80 milk producers, 8 milk vendors, 5 halwais, 3 constructors and 10 consumers revealed that unorganized sector was domination in procurement of milk with the share of about 80%. The producers share in consumer's rupee was highest and price spread was observed lowest in channel II. Study further showed that the efficiency of that channel was low in which number of intermediaries was more.

Wani and Wani (2010) studied Marketing of milk in various Agro-climatic zones of Jammu and Kashmir and found that percentage of household selling milk was highest in the valley temperate zone (80 per cent), followed by subtropical (69 per cent), intermediate (38 per cent) and lowest in cold arid zone (29 per cent). The marketed surplus as percentage of total production varies from 68 per cent in intermediate zone to 73 per cent in subtropical zone.

Singh (2012) reported that dairy co-operative society member households disposed largest share of marketed surplus *ie.* 85.09 per cent to dairy co-operative society, followed by local consumers 10.32 per cent and the remaining 4.58 per cent to Tea shop. The disposal pattern of milk was the same for all the herd size categories in the group. Overall, non-member group disposed maximum share of milk to local consumer constituting 36.01 per cent followed by private dairy 32.59 per cent, teashop 20.26 per cent and the rest 11.15 per cent to dairy co-operative society. The disposal pattern of milk varies across herd size categories in non-member group. It was found that the small and medium categories disposes maximum quantities of milk about 40 per cent to local consumers, while the large household disposed maximum quantities of milk to private dairy accounting to almost 50 per cent of the total milk marketed.

Patidar (2016) reported that there are two main pattern of milk marketing found in the area i.e. sell in the village and sell in the outside of the village. Accordingly, there are 5 main milk marketing channels prevailing in the area.

**Channel I:** producer – consumer (in the village)

**Channel II:** producer - Itinerant traders / vendors – consumer (in the village)

**Channel III:** producer – Itinerant traders / vendors - dairy shop – consumer (outside of village)

**Channel IV:** producer - dairy shop – consumer (outside of village)

**Channel V:** producer – milk co-operative – consumer (outside of village)

The study revealed that producer received the lowest price (Rs.30 per liter) when they sold the milk at village level to consumer or to sell Itinerant traders / vendors (Channel Ist, IInd and IIIrd). This may caused producer's low share in consumer's rupee as compared when producer's sale their produce in the market themselves.

### **2.3 Constraints of commercial buffalo entrepreneurs.**

Dubeet *al.* (1987) observed various problems in adoption in animal husbandry practices. The important constraints were low price of milk and milk product, lack of veterinary hospital in villages and high cost of concentrates.

Chauhanet *al.* (1994) studied losses due to diseases and constraints for dairy development in Jangra district of Himachal Pradesh in 1990-1991. Data colleted form (100) dairy farmer (61 small, 25 medium and 14 large) through personal interview method were analyzed. Study reported high cost of fodder and concentrates, scarcity of fodder, poor quality of agricultural land, illiteracy, scattered holding, lack of grazing land and infestation of weed were reported to be major problem of dairy development.

Thorat and Kulkarni (1994) studied constraints faced by dairy farmer in Shripur Tehsil of Pune district. It revealed that the high cost of feed and fodder (87%) non-availability of loan for purchase of animal (7%), inadequate money for the purchase of animal (69%) and inadequate money for construction of byre (59%) were the major economic constraints. Low rate of milk (29%), Unsuitable time of milk production (26%) and payment of milk not in time were the other constraints faced by the farmers. It revealed that majority of farmers

(85%) were unaware about the preparation of silage in scientific manner and lack of knowledge about the feeding of animal.

Yadav *et al.* (1995) studied the constraints of dairy enterprise in Submontane zone of Maharashtra. The result of the study indicated that the weak financial status, cost factor and management difficulties were the main constraints in not maintaining good quality animals of the farmers. The respondent farm families strongly expressed the need for finance for the purchase of milch animals and also for feed and fodder. It was opined that good quality feed and fodder should be made available at reasonable rates and also need to be assured reasonable and stable prices for milk throughout the year.

Rajendran and Prabhakaran (1998) studied the constraints the constraints in milk production in rural areas of Dharanpuri district of Tamil Nadu. The major constraints in milk production were high feed cost, high investment, low price of milk, inadequate infrastructure facilities for milk marketing, low milk yield, inadequate input supply, high cost of veterinary treatment, disease and repeat breeding. It is concluded that adopting improved feeding and breeding management practices can increase, milk production.

Keshava and Mandape (2001) studied the problems encountered and prospects of dairy farming in Muzaffarpur district of North Bihar. Study revealed that inadequate herd size, low milk productivity and poor feeding practices were major problems characterized dairy farming in the area. The other major problems encountered included disease susceptibility of the animals, costly cattle feeds and unavailability of veterinary facilities and regular milk markets.

Natchinmuthu and Ramkumar (2004) studied the constraints perceived by 210 dairy farmers selected from six villages in Pondicherry region. Economic constraints especially low price for milk and high cost of feed were emanated from the study as the most serious constraints.

Dwaipayan *et al.* (2004) conducted in Udham Singh Nagar district in Uttaranchal to analyze the cost and returns and constraints in milk production from indigenous cattle in different seasons for different categories of farmers. Net returns over total cost on an average basis were found to be negative for

al the three seasons. The major factors, which contributed to unprofitable milk production, were high cost of feed and fodder and non-remunerative prices of milk paid by the dairy co-operatives.

Dwaipayane*et al.* (2005) carried out the study in five randomly selected villages of Rudrapur block of district Udham Singh Nagar; Uttaranchal, to study the major constraints perceived by dairy farmers. A total of 72 farmers were selected as sample for the study, having representations from landless, marginal, small, medium and large farmers. The study established non-remunerative price of milk, testing of milk only on the basis of fat percentage, reproductive problems, distant location of A.I. centers and high cost of feeds to be the major constraints faced by the dairy farmers of the region.

Singh and Chouhan(2006) studied the constraints faced by dairy owners in Jhunjhunu district of Rajasthan state. The data were collected through interview schedule from 720 dairy owners of 40 villages. The major constraints were high cost of feed and fodder and poor resources for raising fodder crops. Other constraints were under feeding of animals high cost of compound feeds, mineral mixtures and fodder seeds, ill equipped veterinary hospitals, lack of vaccines and medicines, high cost of treatment, poor knowledge of scientific management and animals health care practices.

Agarwa*et al.* (2007) studied feeding and breeding constraints in Punjab, Karnataka and West Bengal. High cost of feed and fodder, lack of marketing facilities, non availability of dry fodder, high cost of veterinary treatment were the major hurdles in profitable milk production in the study area.

Rengasamy and Dhaka (2007) identified the major constraints faced by the dairy plants in Tamil Nadu including procurements, processing, manufacturing and distribution of dairy products; the number of respondents were selected based on probability proportion to sample size method. Some members of co-operative society selling milk to vendors and some of the collection centers collecting the inadequate quantity of milk were the very serious problems faced by co-operative and private dairy plants respectively.

Sekhonet *al.* (2008) conducted study in Punjab regarding constraints related to marketing institutional and production. The major constraints in milk production were high feed cost, high investment, low price of milk, inadequate

infrastructure facilities for milk marketing, low milk yield, inadequate input supply, high cost of veterinary treatment, disease and repeat breeding.

Shashiet *al.* (2009) studied the constraints perceived by the dairy farmers in rearing buffaloes in and around Patna. The study was conducted on 60 randomly selected dairy units. Farmers recorded eleven constraints, of which high cost of buffalo ranked first followed by lack of proper housing due to high cost of land, non availability of green fodders and feed supplements, high cost of veterinary medicines, poor result of A.I., lack of finance, uneconomical male calves and non remunerative price of milk which require proper attention on priority basis.

Manjunathaet *al.*(2014) reported that the major constraints faced by the milk producers level were, inadequate availability of fodder (81.66 per cent) followed by feed (53.33 per cent), transport (48.33 per cent), inadequate availability of veterinary services (57.50 per cent) and lack of demand of milk in flush season (76.66 per cent). While at dairy co-operative society's level, the major constraints were milk purity (91.66 per cent) followed by milk pilferage while transport from DCSs to CC (79.16 per cent), labour (37.50 per cent), truck in time to collect the cans from DCSs (41.66 per cent), salaries paid to staff (83.33 per cent), bonus paid by union (50.00 per cent) and building (54.00 per cent).

Patidar(2016) reported that the main constraints confronted by dairy farmers were divided into three main groups and each group having their own importance. The most important constraints was “technological constraints” got rank Ist followed by “socio economic constraints” (rank II<sup>nd</sup>), “marketing constraints” (rank III<sup>rd</sup>) and “credit constraint” (rank IV<sup>th</sup>) respectively.

Pandey *et al.* (2020) Around 60 per cent of the subsidiary income obtained by rural population is from the sale of milk or milk products. The level of knowledge and extent of adoption of dairy farmers towards improved dairy management practices has a critical role in modernizing the dairy farming. The herd size, education, family size, urban contact, extension contact, milk sale (per day), size of land holding, milk production (per day) and social participation were positive and significantly correlated with extent of adoption. Whereas, age of the non-participating respondents was observed negative

and significantly correlated with extent of adoption of the non-participating respondents .

Mahesh *et al.* (2020) The study was conducted on socio-economic profile analysis of dairy farmers of Yadgir district of Kalyana Karnataka region during the year 2019-2020. Dairy farming plays an important role in social and economic livelihood of the farmers. The socio-economic profile of dairy farmers revealed that majority of the farmers (63.00%) belonged to middle age group. 32.00 per cent and 23.00 per cent were educated up to middle school and high school respectively. Majority (87.00 %) of the farmers had animal husbandry plus agriculture as main occupation, 66.00 per cent were belong to nuclear family and OBC category (61.00%), majority of farmers (80%) having local cattle's with small to medium herd size and large number of farmers belong to low milk production and getting low milk yield from local and cross breed, While, 60.00 per cent of the farmers belonged to medium mass media participation, medium extension contact (54.00 %), medium extension participation (55.00 %), medium economic motivation (56.00 %) and medium scientific orientation (50.00%).

## **Chapter – III**

### **RESEARCH METHODOLOGY**

The research methodology determines as material and methods of the study is an important component of any research process. In order to conduct the study and to fulfill the objectives, a prescribed methodology should be followed. Hence, an attempt has been made in this chapter to delineate the methodology adopted for the present study. This chapter deals with following sub-heads:

1. The study area.
2. Sampling procedure.
3. Nature and collection of data and method of enquiry.
4. Analytical procedure and concepts

#### **3.1 The study area:**

Every research study is carried out for certain specific study area and it is essential to describe the profile of that study area as various parameters described in the profile may act as dependent factors. The study has been conducted in Gwalior district of Madhya Pradesh; hence, following description of the district is as follows:

#### **Location:**

Gwalior District lies between North latitude 25°43' and 26°21' and East longitude 77°40' and 78°39' of Madhya Pradesh. The district is bounded by Bhind and Morena in the North, Datia in the East and Shivpuri in the southern direction. There are 3 Tehsils and 4 Blocks in the district. The block headquarters are Ghatigaon, Morar, Dabra and Bhitwar and the total population of the district is 2032036 (As per census 2011). Gwalior district falls under Ganga basin, Yamuna Sub Basin, Sind and Kunwari Minor basin

Gwalior district is situated between 25 0 43 'north and 26 0 21' north latitude and 77 0 40 'east and 78 0 39' in the northern part of Madhya Pradesh. Other

cities and towns in this district are Antari, Bhitwar, Bilaua, Dabra, Morar Cantonment, Pichhore, and Tekanpur.

**Climate:**

The climate of Gwalior district is characterized by hot summer and dryness except during southwest monsoon season. The year can be divided into four seasons. The winter season commences from December to February followed by the hot season from March to middle of June. The period from middle of June to September is the monsoon season; October and November form the post monsoon or transition period. The normal maximum temperature recorded during the month of May is 42.1° C and minimum during the month of January is 7.1°C. The relative humidity generally exceeds 83% and the wind velocity is higher during pre-monsoon period as compared to post-monsoon period.

**Rainfall:**

The normal annual rainfall of Gwalior district is 764.4 mm. Gwalior District receives maximum rainfall during southwest monsoon period i.e. June to September. About 89.1% of the annual rainfall received during monsoon period and only 10.9% takes place during non- monsoon period between October to May. The surplus water for ground water recharge is available only during the monsoon period. The maximum rainfall received at Gwalior is 895.9 mm and minimum at Dabra is 693.1 mm.



### Soil type:

Soils of the Gwalior district are under the broad group of alluvial soils and medium black soil in patches. Generally the soils of Gwalior district are found in category of low fertility status for nitrogen and medium with respect to phosphorus. The soil of Gwalior district can broadly be divided into 4 groups: - 1. Well drained clayey soil on moderate slopes. 2. Deep well drained firm soil on gently sloping. 3. Very shallow, well drained loamy soil on gentle slopes. 4. Moderately deep to deep, well drained to mod drained fine soils on very gentle slopes.

**Major crops:** The major crops of the investigated area are paddy, soybean, jowar and pearl millet in kharif and mustard, gram and wheat in rabi,

**Cropping pattern:**

The major crops grown in the district are Wheat, rice, Jawar, Bajra and others crops in a total area of 1,95,700 Hectare. The other major crops sown in the areas are gram and other pulses in an area of 56,100 Hectare. The total sown area in Kharif and Rabi i.e. gross crop area was 2, 51,800 Hectare.

**Livestock:**

The number of livestock in Gwalior is explained here. Exotic male breed is 3446 female are 12488 so total number of exotic breed is 13440. Number of Indigenous (Desi) male in study area is 16313 and female are 116891 so total Indigenous (Desi) are 133204 in Cattle Population -2019 survey.

**3.2 Sampling procedure:**

Multistage sampling technique was used for drawing a sample for the study.

**(a) Selection of district:**

Among the districts of Madhya Pradesh Gwalior district will be purposively selected. This district stands second position in milk production (399.75 thousand tones), which clearly indicates the importance of dairy farming in the study area.

**(b) Selection of block** - There are totally 4 blocks in Gwalior district namely: Bhitwar, Morar, Ghatigaon and Dabra. Out of these blocks, Morar block is selected purposively due to the highest number of buffaloes (63,735) in this block as compared to number of buffaloes of rest of the blocks in a Gwalior district.

**(c) Selection of villages:**

A list of the villages of Morar block was prepared with the help of block personnel. Out of these, 10 villages were selected randomly. In these villages buffalo milk producers categorized into three different herd group having unit size i.e. small buffalo milk producers (less than 3 buffaloes), medium buffalo milk producers (3-6 buffaloes) and large buffalo milk producers (more than 6

buffaloes). The detail allocation of villages and selection of buffaloes under taken for study is given as bellow:

**Table: 3.1 Allocation of villages and selection of buffaloes:**

| <b>S.No.</b> | <b>Name of village</b> | <b>Total No. of buffaloes' milk producer</b> | <b>Selected no. of buffaloes' milk producer</b> |
|--------------|------------------------|--|---|
| <b>1.</b>    | <b>Uteela</b>          | <b>30</b>                                    | <b>6</b>  |
| <b>2.</b>    | <b>Tiktoli</b>         | <b>27</b>                                    | <b>6</b>  |
| <b>3.</b>    | <b>Rora</b>            | <b>34</b>                                    | <b>6</b>  |
| <b>4.</b>    | <b>Ganeshpura</b>      | <b>45</b>                                    | <b>6</b>  |
| <b>5.</b>    | <b>Hastanapur</b>      | <b>25</b>                                    | <b>6</b>  |
| <b>6.</b>    | <b>Behat</b>           | <b>43</b>                                    | <b>6</b>  |
| <b>7.</b>    | <b>Dabka</b>           | <b>40</b>                                    | <b>6</b>  |
| <b>8.</b>    | <b>Badagaon</b>        | <b>36</b>                                    | <b>6</b>  |
| <b>9.</b>    | <b>Bijoli</b>          | <b>33</b>                                    | <b>6</b>  |
| <b>10.</b>   | <b>Bilara</b>          | <b>35</b>                                    | <b>6</b>  |
| <b>11.</b>   | <b>Total =10</b>       | <b>348</b>                                   | <b>60</b>                                       |

#### **Selection of respondents:**

A list of buffalo milk producers in selected villages was prepared separately as category wise. From these list six buffalo milk producers from each category was selected from each village randomly. Thus, 20 buffalo growers in each category were the sample of the study. Therefore, the total 60 buffalo milk producers were taken into consideration for study from 10 villages in Morar block of district gwalior.

#### **3.3 Nature and collection of data and method of enquiry:**

For present study, primary data was required which was collected from the sample dairy farmers and related milk traders.

**Primary data:**

Primary data was collected from sample dairy farmers regarding general information of the dairy farm and farm family, farm resource structure. The specific and detail information of cost incurred in rearing of buffaloes, production per milk animal and returns realized in production milk had been taken. The other required information was also collected from respondents as per the stated objectives. On the other hand, the data regarding cost of milk marketing, marketing margin of milk traders, marketing price and profitability from different marketing channels was collected from sample milk traders.

**Method of enquiry and study period:**

The data were collected using survey method. The data on different aspects were collected through pre-tested interview schedule. Each selected sample farmers as well as related trades were approached personally for recording of relevant data (Appendix-1). All the collected primary data were related to agricultural year 2017-18.

**3.4 Analytical procedure and concepts**

On the basis of raw data obtained regarding cost and return from dairy enterprise, the data on cost concept and returns in milch production was calculated as under:

**Capital Investment:**

The capital investment on milk production was divided into two heads i.e. non – recurring expenditure and recurring expenditure.

**a. Non – recurring expenditure:** It includes the overhead charges or depreciation on following items.

- (i) Overhead cost on shed
- (ii) Overhead cost on tubewell
- (iii) Overhead cost on equipments and utensils
- (iv) Expenditure on other fixed capital goods

**b. Recurring expenditure:** It includes the actual charges occurred on following items.

- (i) Cost of feed and fodder
- (ii) Labour charges
- (iii) Miscellaneous charges
- (iv) Interest on working capital

**Receipts from Dairy farms:**

A total receipt from the dairy unit was calculated separately on each farm and each source. The milk production was considered as main source of receipt from dairy enterprise.

In study a total receipt from the dairy unit (from milk production) was calculated separately on the basis of total milk production in a year multiplied by the average market price of milk during the study period.

**Concept used in economics of milk production:**

**Evaluation of farm inputs:**

Methods followed in evaluating different farm inputs for the present study was described in the following paragraphs.

**i. Hired human labour:**

The dairy farmers normally engage permanent farm labour on the basis yearly wages and casual labour on daily wages basis, for performing daily operations in dairy farm. The casual labour was evaluated on the basis of actual wages prevailed in the locality. The wages of male and female labour included payment given both in cash or kind. The value of kind components given to the labour was calculated at their prevailing market prices.

**ii. Family labour:**

The family labour cost was evaluated at the rate of prevailing wages in locality for casual hired labour at various stages of dairy operations.

### iii. Depreciation on fixed assets:

The straight-line method is used for calculating rate of depreciation. The depreciation rates for different fixed assets are taken as follow: -

Nature of fixed assets yearly

Dairy farm shed (temporary) for 20 years 10.00%

Dairy farm shed (bricks) for 50 years 5.00%

Tubewell for 20 years 10.00%

Equipments and utensils for 5 years 10.00%

Other perishable inputs, which are exhausted

During year e.g. rope, bin etc. 100.00%

### iv. Interest on working capital:

It was worked out @ 7 per cent yearly.

### Profitability concepts:

For the estimation of profitability from milk production, the following efficiency measures were used in this study:

i. Production of milk (liter per year)

ii. Net farm income,

iii. Input- output ratio,

**Net farm income:** It is defined as:

Market price of milk received – Cost of production

**Input – output ratio:**

$$\text{Input – output ratio} = \frac{\text{Market price received}}{\text{Cost of production}}$$

**Marketing channel:**

Marketing channel is a path traces in the direct or indirect transfer of title to a product, as it moves from a producers to ultimate consumer. Market channel is the structure of intra agents and dealers, wholesalers and retailers through which the commodity, product or services is marketed.

**Marketing costs:**

Marketing cost includes all the marketing charges paid by dairy farmers, traders / vendors of milk from local assembling to consumer point.

**Market margins:**

It includes profit of margins kept by different market functionaries.

**Total marketing cost:**

It consists of marketing cost and marketing margin together.

**Price spread:**

To calculate the price spread of milk for different marketing channels, the following estimates was obtained:

- Weighted average of price received by the milk producers from different market intermediaries
- Average marketing cost incurred by the farmers to sell their produce to various intermediaries
- The net price received by producers at the time of first sale:

$$P_F = P_A - C_F$$

Where,

$P_F$  = Net price received by producers (Rs./ liter)

$P_A$  = Weighted average of price received by the producers (Rs./liter)

$C_F$  = Marginal cost incurred by the producers (Rs./ liter)

- Producers' share in the consumers' rupee was as follows:

$$P_S = (P_F/P_C) \times 100$$

Where,

$P_S$  = Producers' share in the consumers' rupee

$P_C$  = Price paid by the consumer

$P_F$  = Net price received by producers

- The average price prevailing for milk, at different stages of marketing.

To calculate the margins of different intermediaries following formula was used

$$(a) A_{mi} = P_{Ri} - (P_{Pi} + C_{mi})$$

Where,

$A_{mi}$  = Net margin of the middlemen (Rs./ liter)

$P_{Ri}$  = Sale price (Rs./ liter)

$P_{Pi}$  = Purchase price (Rs./ liter)

$C_{mi}$  = Cost incurred on marketing (Rs./ liter)

- (b) Percentage margin of type of market functionary ( $P_{mi}$ ):

$$P_{mi} = \frac{P_{Ri} - (P_{Pi} + C_{mi})}{P_{Ri}} \times 100$$

Where,

$P_{Ri}$  = Total value of receipts/produce (Rs./ liter)

$P_{Pi}$  = Purchase value of goods/units (Rs./ liter)

$C_{mi}$  = Cost incurred on marketing per unit of produce (Rs./ liter)

- The average price paid by the ultimate consumer
- The percentage share of total marketing cost and margins in the price paid by the ultimate consumers:

$$(a) \quad C_S = (C/P_C) \times 100$$

Where,

$C_S$  = Percent share of total marketing cost in consumers' rupees

$C$  = Total marketing cost (Rs./ liter)

$P_C$  = Price paid by the consumer

$$(b) \quad M_{TS} = (M_T/P_C) \times 100$$

Where,

$M_{TS}$  = Percent share of total margins in consumers' rupee

$M_T$  = Total margins

$P_C$  = Price paid by the consumer

- Acharya's (Acharya and Agarwal, 1992) modified measure of marketing efficiency was used to calculate the efficiencies of the channels

$$MME = FP/(MC+MM)$$

Where,

MME = Modified Measure of Marketing Efficiency

FP = Prices received by the Farmers

MC = Total Marketing Cost

MM = Marketing Margin

**Producer share in the consumer's rupee:**

Producer share in the consumer's rupee has been calculated by using following formula:

$$P = \frac{C-M}{C} \times 100$$

Where,

P= Producer share in the consumer's rupee

C= Consumer's rupee

M= Marketing cost

**Marketing efficiency:**

The marketing efficiency is measured with the help of the following formula given by Shepherd:

$$ME = \frac{V}{I} - 1$$

Where,

ME = Index of Marketing Efficiency,

V = Value of goods sold or consumer price and

I = Total marketing cost or marketing cost per unit.

The higher the ratio the more marketing efficiency and vice versa.

## Chapter - IV

### Results

The results of present investigation pertaining to the objectives of the study as stated earlier are presented and discussed in this chapter under four sections. The first section cost and return of buffalo milk production has been discussed. Section two marketing pattern of milk i.e. marketing channels, price spread, and marketing efficiency. Factors affecting milk production and constraints faced by milk producer has been discussed in section three and four respectively. As per the objectives of study the result is presented and described in following sub head.

- To work out the cost and return of buffalo milk production in the study area.
- To study the marketing pattern of milk i.e. marketing channels, price spread, and marketing efficiency
- To determine the factors affecting of the milk production.
- To identify the constraints faced by milk producer in the study area.

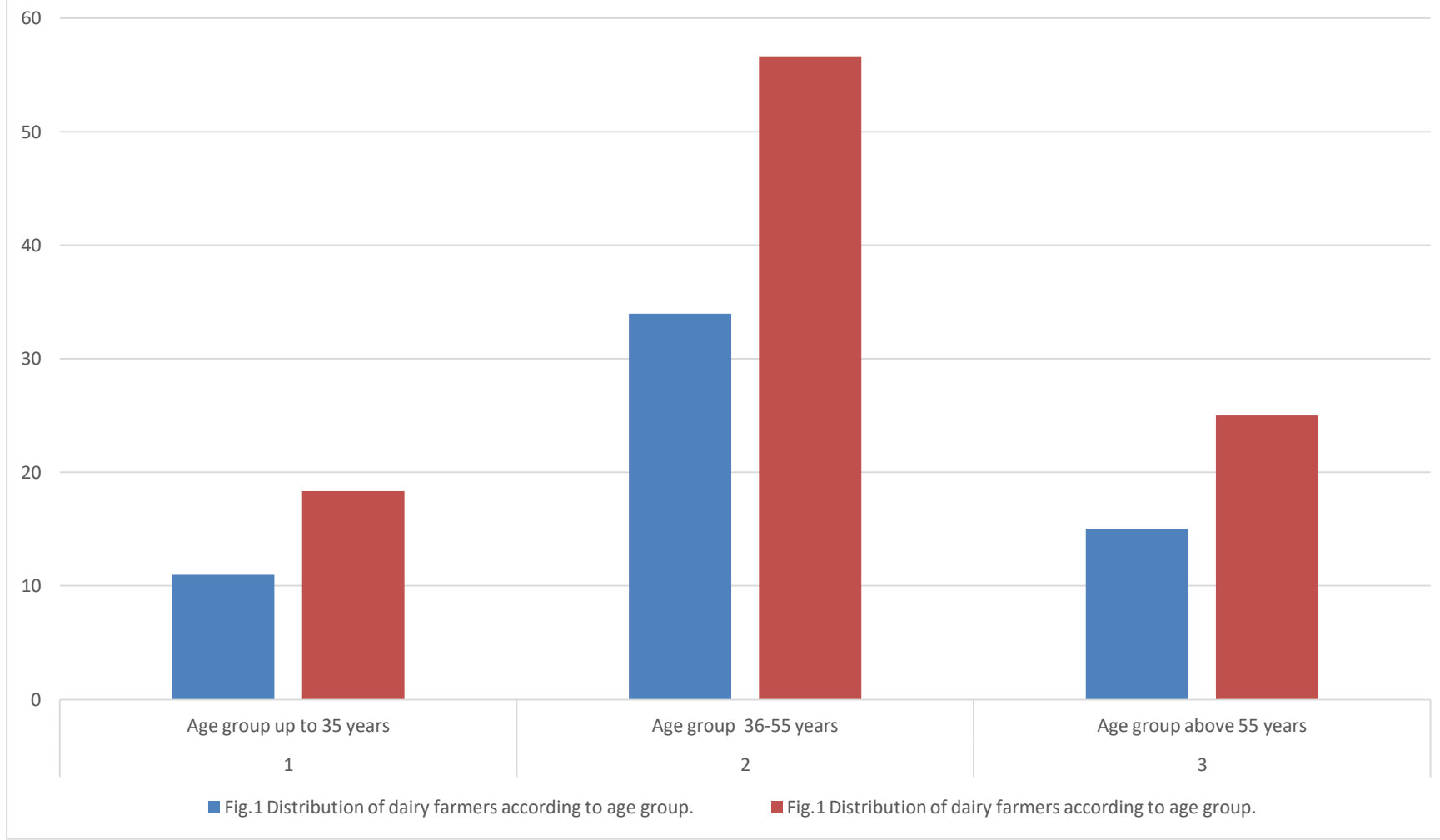
#### 4.1 Basic information about the farm household of the study area:

The major socio-economic characteristics considered were age, education level family size and type, size of land holding, education level, etc and there have been discussed in details as below.

**Table: 4.1 Distribution of dairy farmers according to age group.**

| S.No. | Age                      | Frequency | Percentage |
|-------|--------------------------|-----------|------------|
| 1     | Age group up to 35 years | 11        | 18.33      |
| 2     | Age group 36-55 years    | 34        | 56.66      |
| 3     | Age group above 55 years | 15        | 25         |
|       | Total                    | 60        | 100        |

Distribution of farmers according to age group.



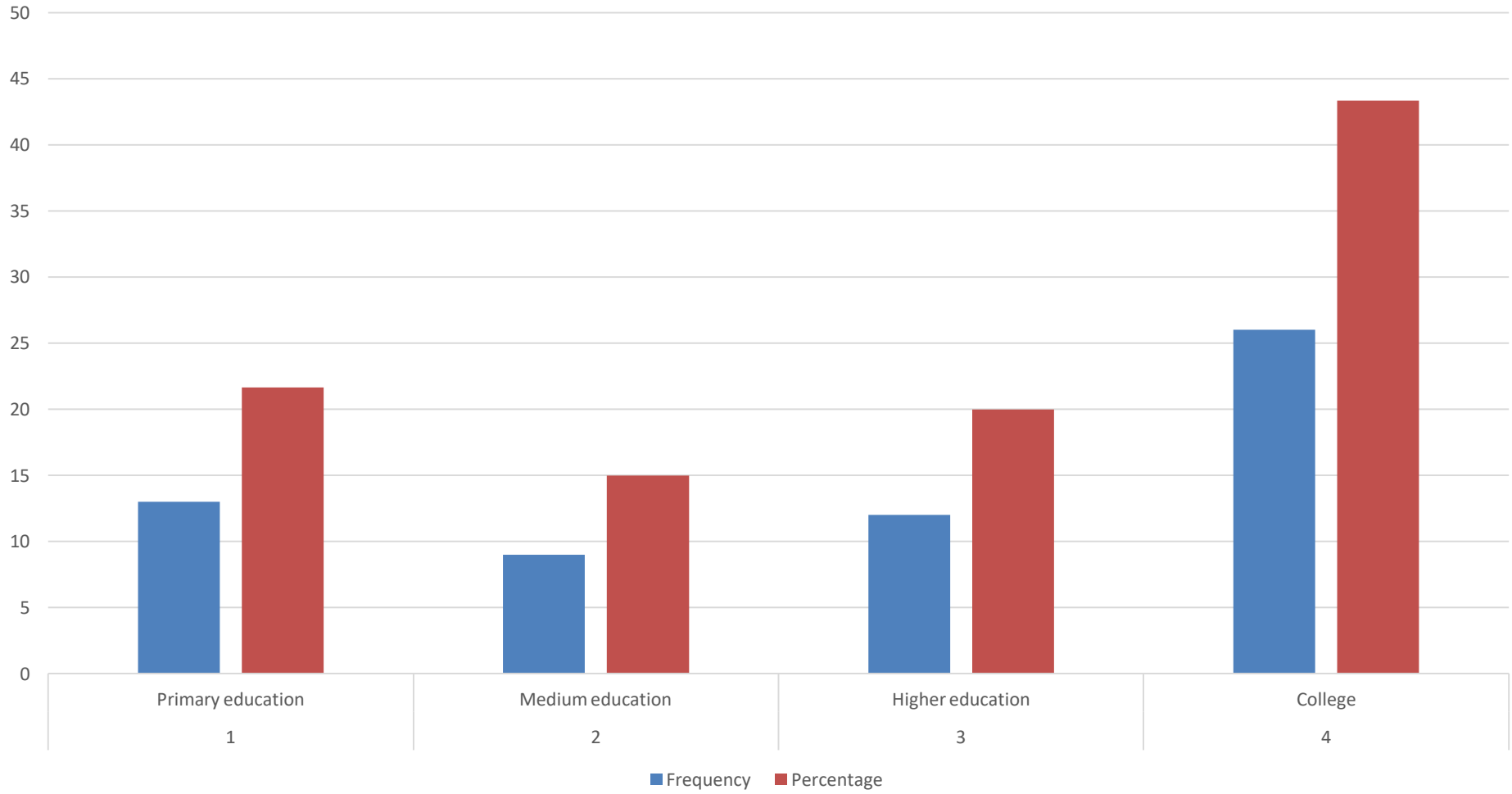
The above table 4.1 indicates that the majority of 56.66 percent dairy farmers were belonging to age group of 36-55 years, followed by 25 percent belonging to age group of above 55 years and remaining 18.33 percent had belonging up to 35 years age group category.

It may be concluded from the above table that most of the dairy farmers belonging to 36-55 years age group and they were taking more interest in dairy farming in this area.

**Table 4.2 Distribution of dairy farmers according to their education status**

| <b>S.No.</b> | <b>Education status</b> | <b>Frequency</b> | <b>Percentage</b> |
|--------------|-------------------------|------------------|-------------------|
| <b>1</b>     | Primary education       | 13               | 21.66             |
| <b>2</b>     | Medium education        | 09               | 15                |
| <b>3</b>     | Higher education        | 12               | 20                |
| <b>4</b>     | College                 | 26               | 43.33             |

Distribution of dairy farmers according to their education status



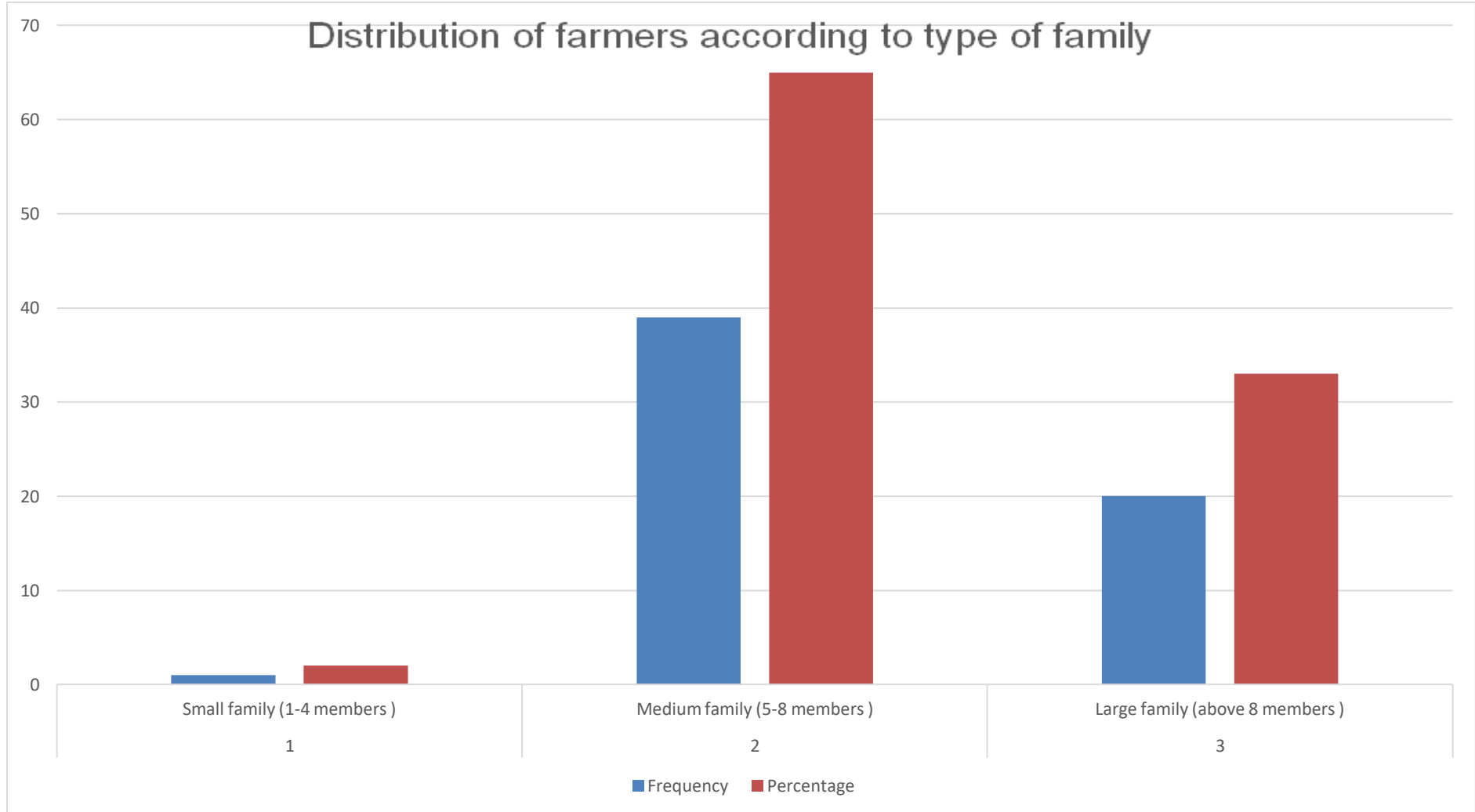
It was evident from the table 4.2 that the majority of 43.33 percent dairy farmers were literate up to college level, followed by 21.66 percent, 20 percent, 15 percent, dairy farmers were having education up to Primary school, Medium education, higher education respectively. Thus the total literate farmers were 100 percent.

It may be concluded clear from the above table that the most of the dairy farmers were educated and interested in dairy farming.

**Table 4.3: Distribution of dairy farmers according to their size of family**

| <b>S.No.</b> | <b>Size of family</b>           | <b>Frequency</b> | <b>Percentage</b> |
|--------------|---------------------------------|------------------|-------------------|
| <b>1.</b>    | Small family (1-4 members )     | 1                | 2                 |
| <b>2.</b>    | Medium family (5-8 members )    | 39               | 65                |
| <b>3.</b>    | Large family (above 8 members ) | 20               | 33                |

### Distribution of farmers according to type of family



The data given in the table 4.3 indicated the majority of 65 percent farmers were having 5-8 members in a family and it comes into medium family group, followed by 33 percent and 2 percent large family group and small family group. It may be observed that maximum percentage of dairy farmers was living 5-8 member size of family. These sizes of family were more active in milk production activities.

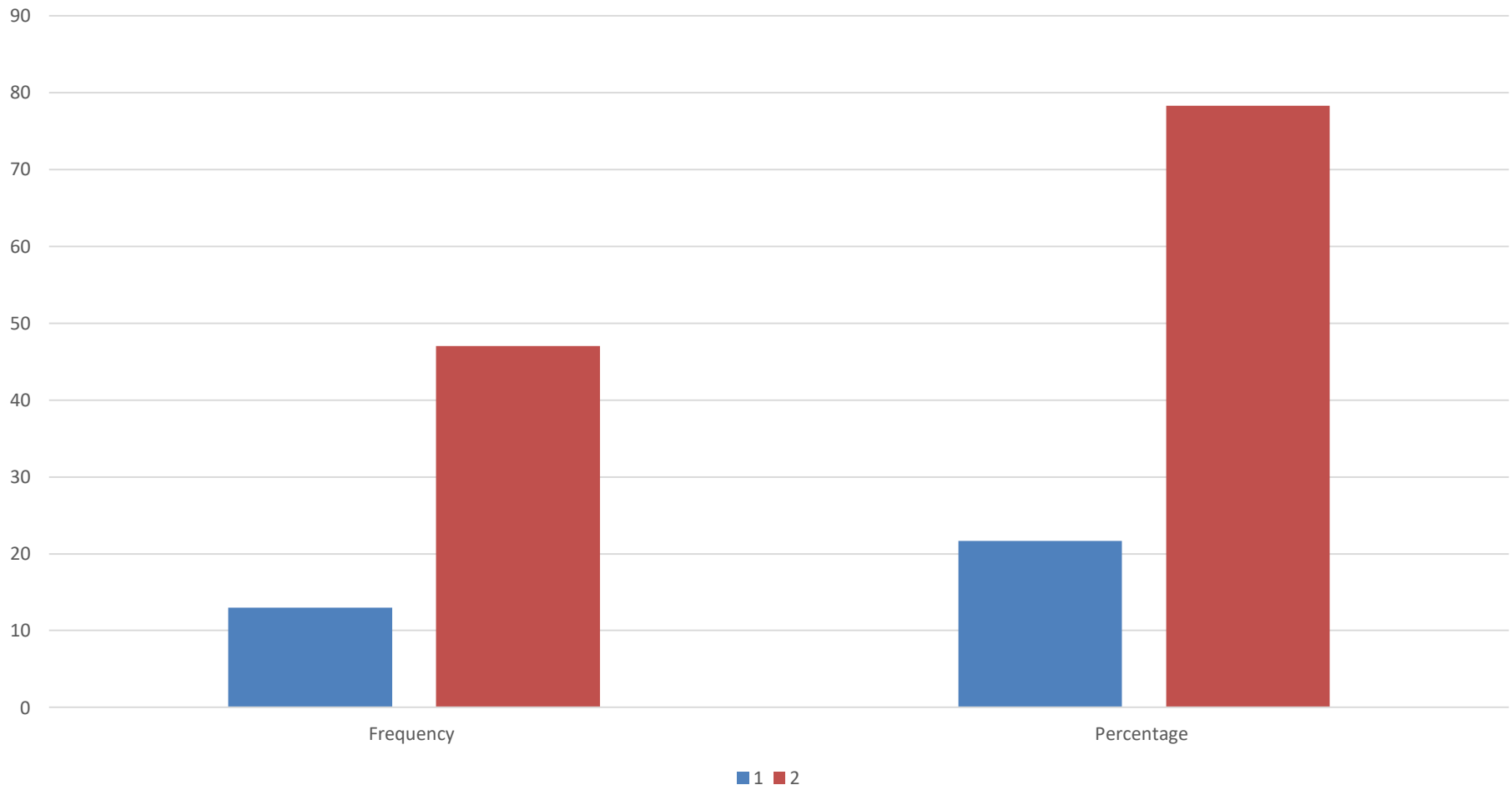
**Table-4.4: Distribution of dairy farmers according to their type of family.**

| <b>S.No.</b> | <b>Type of family</b> | <b>Frequency</b> | <b>Percentage</b> |
|--------------|-----------------------|------------------|-------------------|
| <b>1</b>     | Nuclear family        | 13               | 21.66             |
| <b>2</b>     | Joint family          | 47               | 78.33             |

The table 4.4 revealed that the majority of 78.33 percent dairy farmers were living in joint family and the remaining 21.66 percent sample household were living in nuclear family in the Gwalior district.

It may be concluded from the above that most of the dairy farmers believed joint family living for progress.

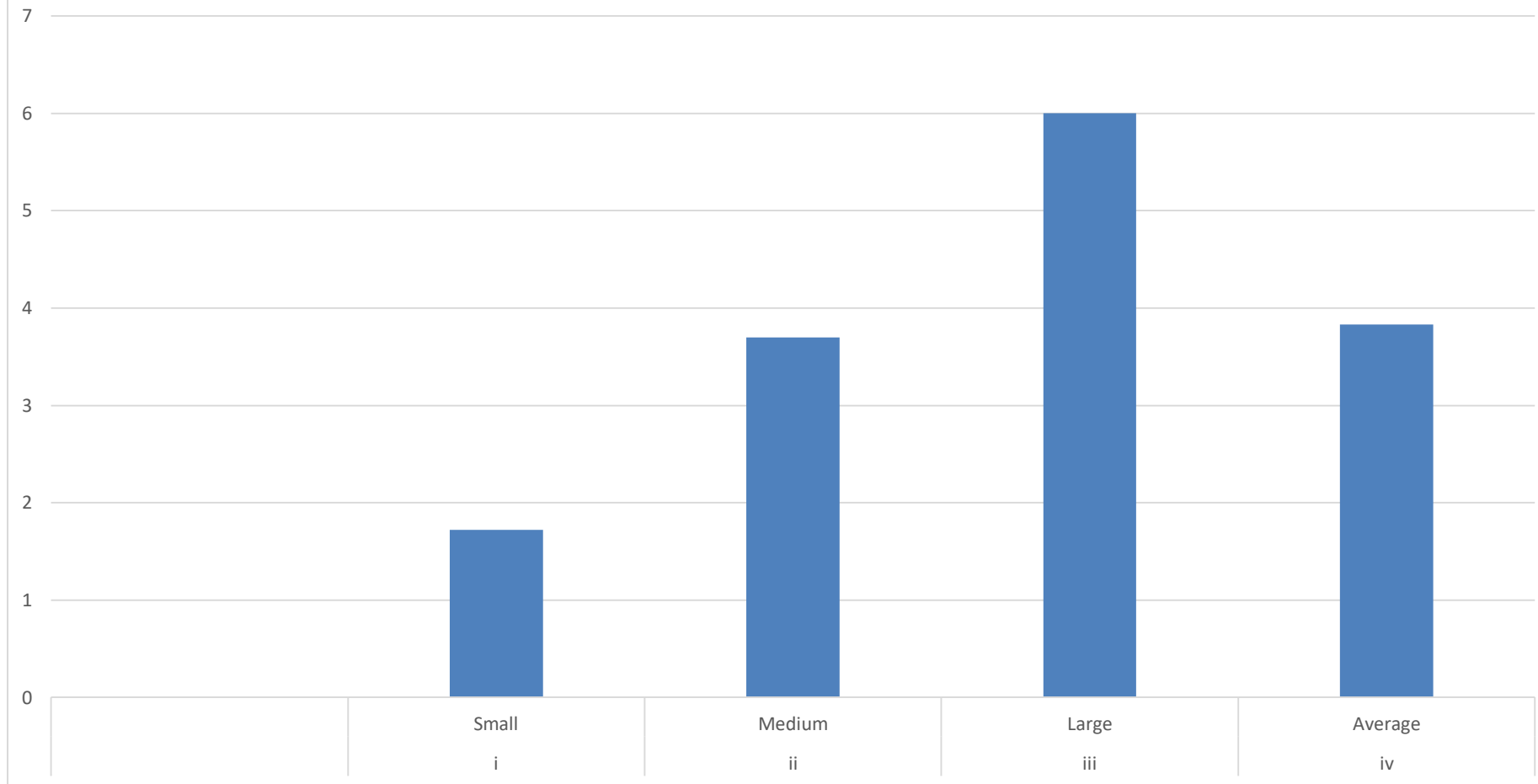
Distribution of farmers according to size of family



**Table: 4.5 Distribution of dairy farmers according to their land holding.**

| <b>S.No.</b> | <b>Size of herd</b> | <b>Average (Hectare)</b> |
|--------------|---------------------|--------------------------|
| <b>i</b>     | Small               | 1.72                     |
| <b>ii</b>    | Medium              | 3.70                     |
| <b>iii</b>   | Large               | 6.0                      |
| <b>iv</b>    | Average             | 3.83                     |

distribution of farmers according to land holding (Hectare)



Study depicted that the overall average size of holding with dairy farmers was found to be 3.83 hectare per farm. It is also evident from the data that the average size of holding with small size of herd farmers represents to 1.72 hectare per farm followed by 3.70 average hectares with medium farmers and 6.0 average hectares with dairy farmers of large size of herd.

**Table: 4.6 Distribution of dairy farmers according to buffaloes their prices**

| <b>S.No.</b> | <b>Size of herd</b> | <b>Total buffaloes<br/>(in the group)</b> | <b>No. of buffaloes<br/>(per unit)</b> | <b>Price<br/>(Rs/buffaloes)</b> |
|--------------|---------------------|---|--|---------------------------------|
| <b>i</b>     | Small               | 47  | 2.35                                   | 57000                           |
| <b>ii</b>    | Medium              | 98  | 4.9                                    | 59750                           |
| <b>iii</b>   | Large               | 147                                       | 7.20                                   | 60375                           |

The data presented in the table 4.6 indicated that the strength of buffaloes was found to be 2.35, 4.9 and 7.20 per unit with average price of Rs. 57000, Rs.59750 and Rs. 60375 on small, medium and large herd size respectively in the study area.

It may be concluded from the above table that most of the farmers were more interested in milk production activities.

**Table: 4.7 The value of fixed costs items with different size of dairy farmers**

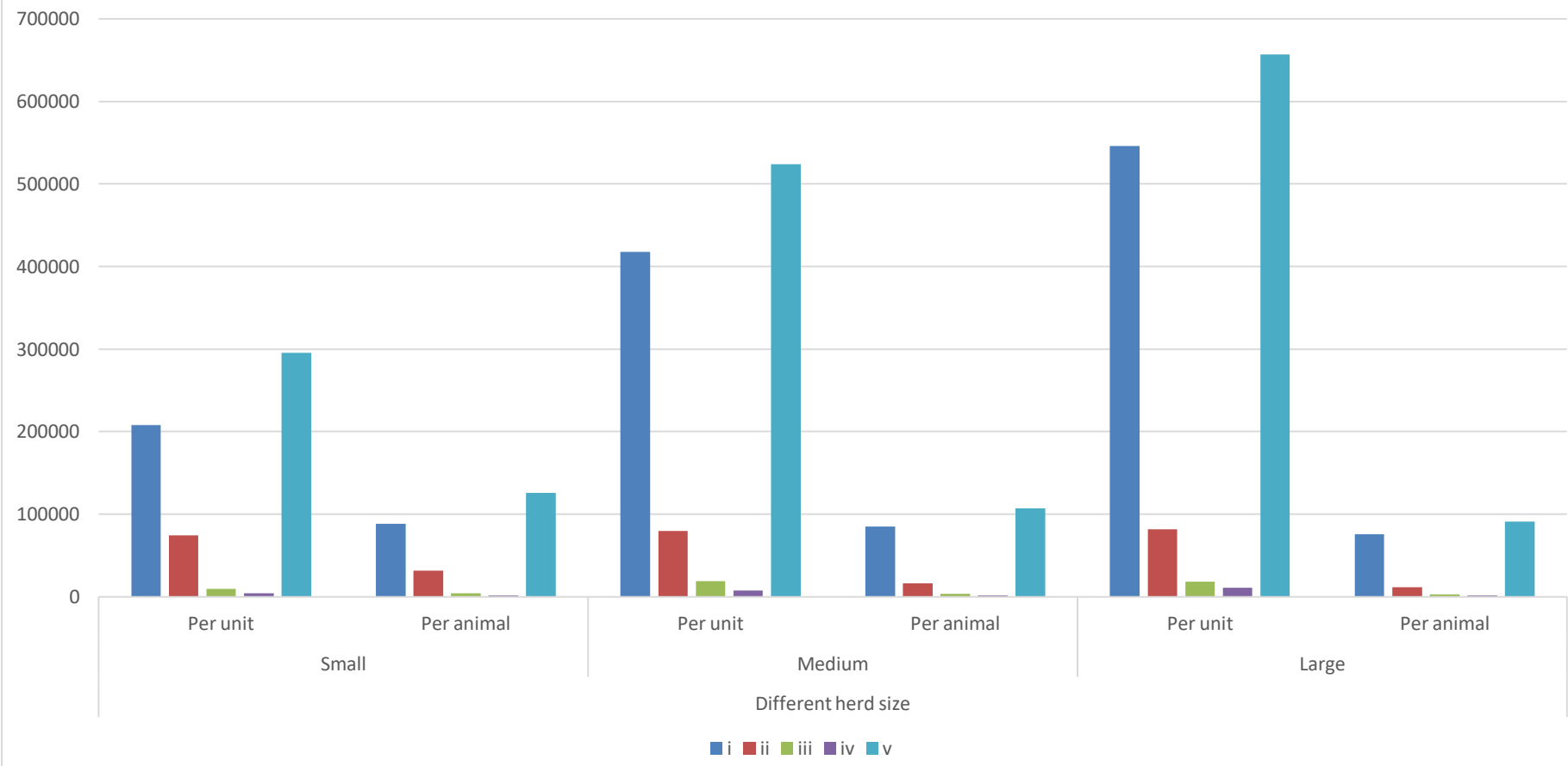
(Rs.)

| S.No | Fixed assets          | Different herd size |            |          |            |          |            |
|------|-----------------------|---------------------|------------|----------|------------|----------|------------|
|      |                       | Small               |            | Medium   |            | Large    |            |
|      |                       | Per unit            | Per animal | Per unit | Per animal | Per unit | Per animal |
| i    | Shed house            | 208054              | 88533      | 417529   | 85210      | 546020   | 75836      |
| ii   | Tubewell              | 74000               | 31489      | 80000    | 16326      | 82000    | 11388      |
| iii  | Equipment and utensil | 9215                | 3921       | 18750    | 3826       | 18260    | 2536       |
| iv   | Miscellaneous         | 3913                | 1665       | 7745     | 1580       | 10975    | 1524       |
| v    | Total fixed assets    | 295182              | 125608     | 524024   | 106943     | 657255   | 91285      |

The above table 4.7 revealed that cost on shed housing per unit on small, medium and large size of herd was found to be Rs.208054, Rs.417529, Rs.546020, and Rs. 88533, Rs.85210 and Rs.75836 per buffaloes respectively.

The cost on tubewell for watering purpose on small, medium and large size of herd was found to be Rs.74000, Rs.80000, Rs.82000, and Rs. 31489, Rs.16326 and Rs.11388 per buffaloes respectively, followed by equipment & utensil and miscellaneous items on small, medium and large dairy farmers i.e Rs. 9215 & 3913, Rs.18750 & 7745, and Rs. 18260 & 10975 per unit

The value of fixed costs items with different size of dairy farmers



Respectively with an average of per animal was Rs. 3921 & 1665, Rs.3826 & 1580 and Rs. 2536 & 1524 on small medium and large herd group farmers respectively.

The total fixed cost on small, medium and large dairy farm and per animal was found to be Rs.295182 & 125608, Rs.524024 & 106943 and Rs.657255 & 91285 respectively.

Data revealed that the cost of all fixed items increases with increasing the herd size but cost on per animal vise-versa with the size of herd.

#### **4.2 Cost of maintenance per milch buffalo per year on different herd size groups:**

The table 4.8 indicated that the cost of milk production in dairy farm, a portion of fixed cost i.e. called overhead charges per annum on different herd size on per animal basis. The detail of overhead charges incurred in maintenance of buffalo has been presented in table 4.8

**Table: 4.8 Overhead charges on fixed capital for maintenance of buffaloes per year in different size of herd.**

(Rs./buffalo)

| S.No. | Fixed assets          | Different herd size |        |       |         |
|-------|-----------------------|---------------------|--------|-------|---------|
|       |                       | Small               | Medium | Large | Average |
| i     | Value of buffalo      | 644                 | 661    | 667   | 657     |
| ii    | Shed house            | 677                 | 647    | 447   | 590     |
| iii   | Tubewell              | 371                 | 211    | 151   | 244     |
| iv    | Equipment and utensil | 149                 | 126    | 64    | 113     |
| v     | Miscellaneous         | 62                  | 51     | 33    | 49      |
| vi    | Total fixed assets    | 1902                | 1697   | 1362  | 1654    |

The data given in the above table indicated that the average overhead cost on "value of buffaloes" was found to be Rs.657 per buffalo per annum followed by Rs.590, Rs.244, Rs.113 and Rs.49 on shed house, tubewell,

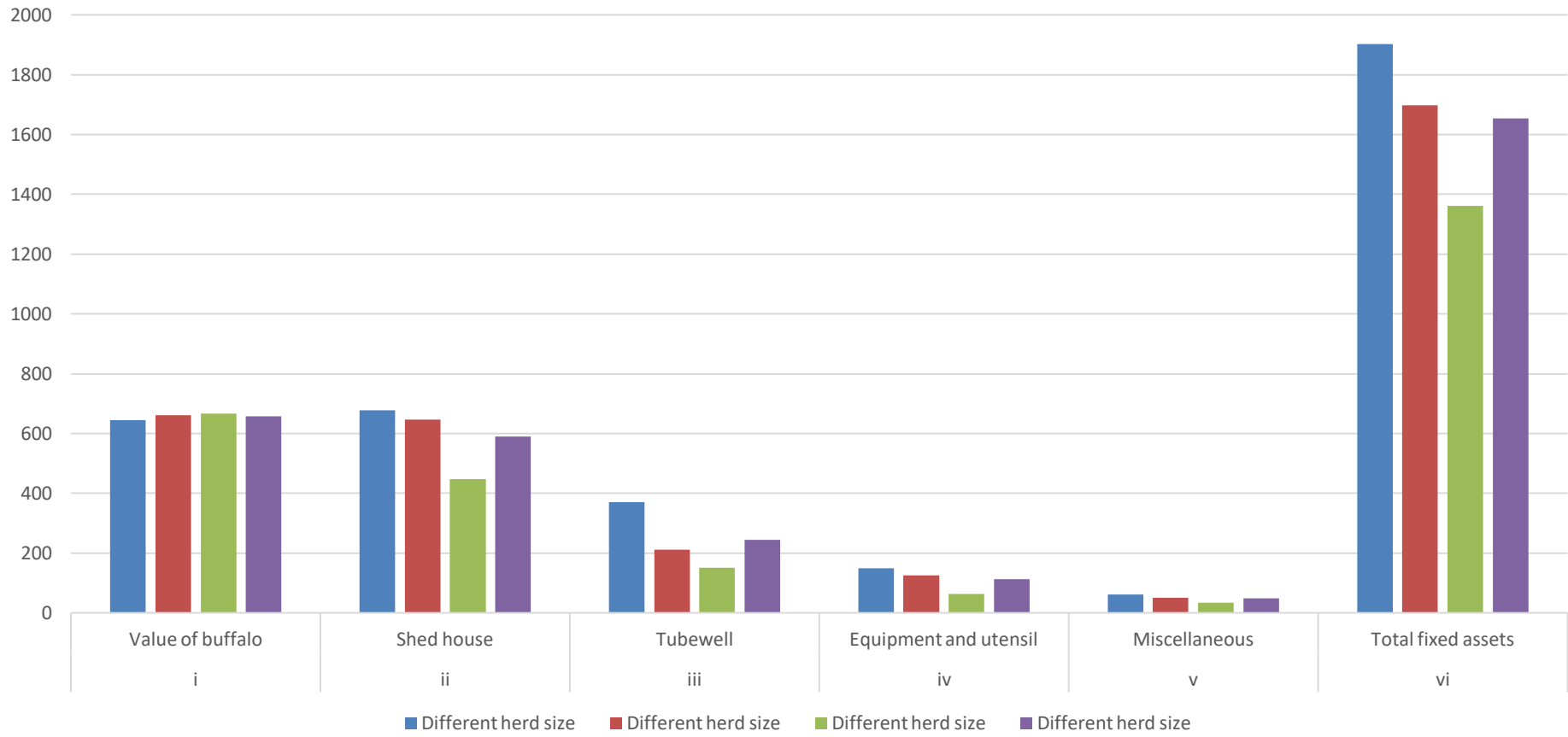
equipment and utensil and miscellaneous assets respectively with an total average of fixed assets found to be Rs.1654 per buffalo per annum.

Study revealed that among the total fixed assets the overhead cost on value of buffaloes have been found to maximum in case of large herd size Rs.667 per buffalo per annum followed by Rs.661 and Rs.644 per buffalo per annum in case of medium and small herd size respectively. Data shows that the overhead cost of buffalo found to increase with increasing size of herd.

The overhead cost on shed house was found to be Rs. 677, Rs.647 and Rs.447 on small, medium and large herd size per annum per animal respectively. It is revealed that the overhead cost of shed house found to decrease with increasing size of herd.

Tubewell is essential for water management to maintain the dairy farm. Study revealed that in case of small herd size Rs.371 per buffalo per annum followed by Rs.211 and Rs.151 per buffalo per annum in case of medium and large herd size farmers.

**Overhead charges on fixed capital for maintenance of buffaloes per year in different size of herd.**



In

dairy

farming

chaff cutter is the only specific equipment and other are determine as utensil. Data shows that in case of small herd size Rs.149 per buffalo per annum followed by Rs.126 per buffalo per annum in case of medium herd size and Rs.64 per buffalo per annum in case of large herd size farmers.

Apart from the other fixed cost there are some miscellaneous overhead charges also required. Study revealed that in case of small herd size Rs.62 per buffalo per annum followed by Rs.51 per buffalo per annum in case of medium herd size and Rs.33 per buffalo per annum in case of large herd size farmers.

The total overhead charges on fixed assets to maintain the dairy herd revealed that in case of small herd size Rs.1902 per buffalo per annum followed by Rs.1697 per buffalo per annum in case of medium herd size and Rs.1362 per buffalo per annum in case of large herd size farmers. It is revealed that the overall overhead cost of fixed assets found to decrease with increasing size of herd.

#### **Operational costs for milch animals:**

The working capital has been considered as total operational expenses incurred in maintaining per milch animal (buffaloes) per annual basis i.e feeds, fodder, labour etc.

#### **Expenses on feeds and fodder:**

Feeding of animals depends on availability of feeds and fodder during different season in a year. In the study area the feeding material includes dry fodder, green fodder and concentrate. The details regarding feeding practices and their respective costs incurred has been presented in table 4.9.

**Table: 4.9 Expenses on feeds and fodder on per buffalo per year in different size of herd.**

**(Rs./buffalo)**

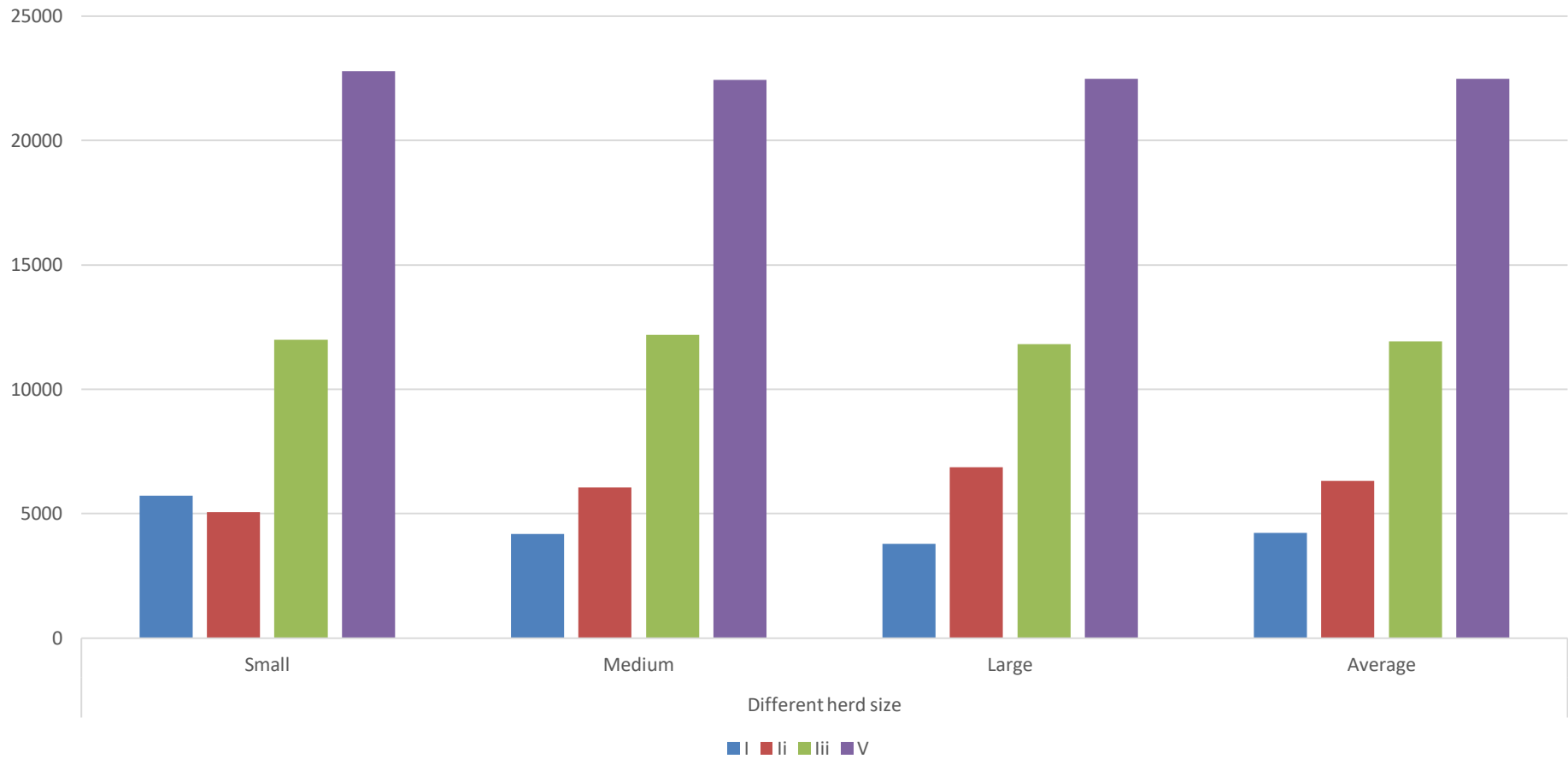
| S.No.      | Feed and fodder     | Different herd size |              |              |              |
|------------|---------------------|---------------------|--------------|--------------|--------------|
|            |                     | Small               | Medium       | Large        | Average      |
| <b>I</b>   | <b>Dry fodder</b>   | 5731                | 4185         | 3797         | 4230         |
| <b>li</b>  | <b>Green fodder</b> | 5053                | 6057         | 6875         | 6325         |
| <b>lii</b> | <b>Concentrate</b>  | 11997               | 12188        | 11806        | 11924        |
| <b>V</b>   | <b>Total</b>        | <b>22781</b>        | <b>22430</b> | <b>22478</b> | <b>22479</b> |

Data indicated that the overall average total cost on feed and fodder was accounted Rs.22479 per buffalo per annum.

The total costs incurred in various types of feeds and fodders per buffalo in a year found to variation in various size of herd. The average total cost on feed and fodder in case of small dairy farmers was accounted Rs.22781 per buffalo per annum followed by large herds size and medium herd size i.e. 22478 and 22430 respectively.

Data regarding cost of feed and fodder per buffalo per annum indicated that it was at par in all categories of herds.

Expenses on feeds and fodder on per buffalo per year in different size of herd



### **Miscellaneous costs and labour charges on milch animal:**

The detail of expenditure incurred on labour wage (family and hired labour) and other expenses are presented in table 4.10.

**Table: 4.10 Miscellaneous costs and labour charges on per buffalo per year in different size of herd.  
(Rs./buffalo)**

| S.No. | Items              | Different herd size |        |       |         |
|-------|--------------------|---------------------|--------|-------|---------|
|       |                    | Small               | Medium | Large | Average |
| I     | Miscellaneous cost | 2430                | 2660   | 2815  | 2635    |
| li    | Labour charge      | 35587               | 36072  | 38250 | 36636   |
| lii   | Total              | 38017               | 38732  | 41065 | 39271   |

Study depicted that the overall average total miscellaneous and labour cost was accounted Rs. 39271 per buffalo per annum.

The study revealed that the average cost on other miscellaneous cost in case of small size of herd was accounted to Rs.2430 per buffalo per annum followed by Rs.2660 and 2815 per buffalo per annum in case of medium and large size of herd. It is positively related to herd size.

The total cost on labour incurred Rs.35587, Rs.36072 and Rs.38250 per buffalo per annum in case of small, medium and large size of herd per buffalo per annum respectively.

The total average cost on labour and miscellaneous expenses was accounted Rs.38017 per buffalo per annum in small size of herd while; it was Rs.38732 per buffalo per annum on medium size of herd and Rs.41065 per buffalo per annum in case of large size of herd.

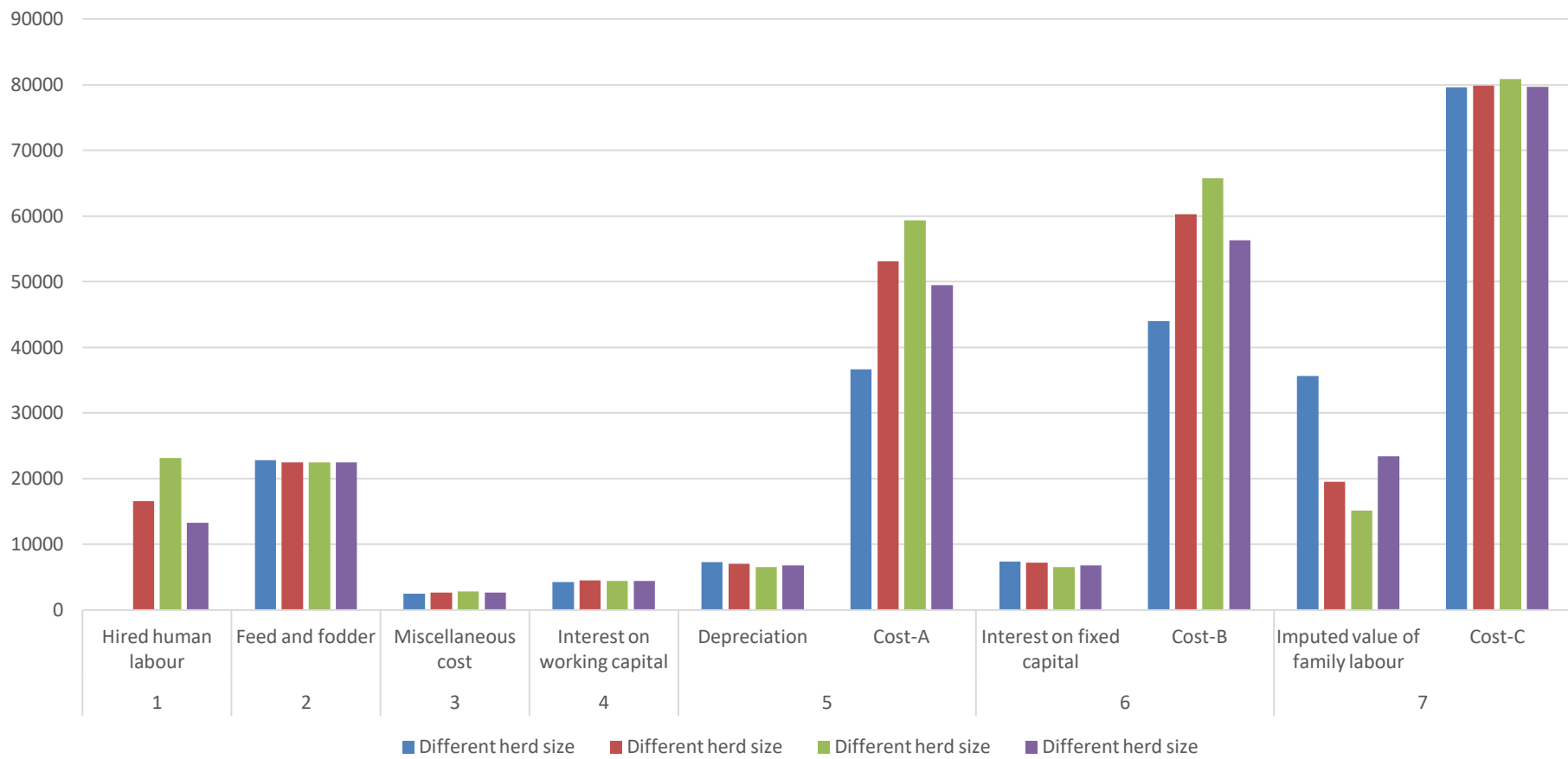
### **Cost and return from buffalo milk production**

The table 4.11 indicated the data regarding total cost i.e cost-A, cost-B and cost –C for rearing a buffaloes per year on different size of dairy farmers.. In total cost both overhead cost (share of fixed cost) and operational costs and interest on these are added together. The details of total cost of maintenance per buffalo per year have been presented in table 4.11.

**Table: 4.11 Total cost of maintenance per buffalo per year in different size of herd.  
(Rs/buffalo)**

| S.No. | Detail of costs                | Different herd size |              |              |              |
|-------|--------------------------------|---------------------|--------------|--------------|--------------|
|       |                                | Small               | Medium       | Large        | Average      |
| 1.    | Hired human labour             | 0                   | 16575        | 23135        | 13236        |
| 2.    | Feed and fodder                | <b>22781</b>        | <b>22430</b> | <b>22478</b> | <b>22479</b> |
| 3.    | Miscellaneous cost             | 2430                | 2660         | 2815         | 2635         |
| 4.    | Interest on working capital    | 4215                | 4457         | 4361         | 4359         |
| 5.    | Depreciation                   | 7239                | 6995         | 6509         | 6779         |
|       | <b>Cost-A</b>                  | <b>36665</b>        | <b>53117</b> | <b>59298</b> | <b>49488</b> |
| 6.    | Interest on fixed capital      | 7330                | 7181         | 6470         | 6792         |
|       | <b>Cost-B</b>                  | <b>43995</b>        | <b>60298</b> | <b>65768</b> | <b>56280</b> |
| 7.    | Imputed value of family labour | 35587               | 19497        | 15115        | 23347        |
|       | <b>Cost-C</b>                  | <b>79582</b>        | <b>79795</b> | <b>80883</b> | <b>79627</b> |

**Total cost of maintenance per buffalo per year in different size of herd.**



The component wise various costs incurred in the milk production are given in above table 4.11. A perusal of table reveals that, the average operational cost i.e. Cost A was Rs.49488/buffaloes/year followed by Cost B and Cost C i.e. Rs. 56280 and Rs.79627 respectively. In cost A, more than 60 percent contribution from hired labour and feed & fodder and remaining from depreciation, interest on working capital and miscellaneous cost.

It is revealed that the overall average operational cost i.e. cost A was Rs.59298, Rs.53117 and Rs.36665 per buffalo per annum in case of large, medium and small size of herd respectively. In cost A, more than 60 percent contribution from hired labour and feed & fodder and remaining from depreciation, interest on working capital and miscellaneous cost in all categories of herd size. Hired labour contribution was found zero in small category.

The total cost estimates i.e. cost C includes cost-A and cost-B was determine for maintenance of per buffalo per annum. The overall average cost i.e. cost C was found to be Rs.79582, Rs.79795 and Rs.80883 per buffalo per annum on small, medium and large dairy farmers respectively. Study revealed that cost C was found to highest in case of large size of herd followed by medium and small categories.

Data regarding total cost of maintenance per buffalo per annum indicated that it was increasing with increasing size of herd and it was due to size of economy.

## **B. Return and profitability from milk production:-**

The detail data on milk production and return from main product and by-product incurred have been presented in the table 4.12.

**Table: 4.12 Milk production and return incurred per buffalo per year in different size of herd.**

**(Rs./ buffalo)**

| S.No. | Detail of receipt                     | Different herd size |         |         |         |
|-------|---------------------------------------|---------------------|---------|---------|---------|
|       |                                       | Small               | Medium  | Large   | Average |
| 1.    | <b>Total milk production (liters)</b> | 2675                | 2602    | 2745    | 2682    |
| 2.    | <b>Gross return from milk (Rs.)</b>   | 123050              | 117090  | 123525  | 121495  |
| 3.    | <b>Gross return from dung (Rs.)</b>   | 22644               | 21922   | 19710   | 20858   |
| 4.    | <b>Total gross return (Rs.)</b>       | 145694              | 139012  | 143235  | 142353  |
| 5.    | <b>Net return</b>                     | 57052.7             | 50474.1 | 53649.9 | 54021.5 |

The table 4.12 shows that the overall average milk production per milch animal (buffalo) was found to 2682 liter per year with an average gross return from milk and dung was Rs.121495 and Rs. 20858 respectively. The total overall average gross return was Rs.142353 per year. Net return was calculated by total cost reduced from total gross return. Average net return was to be found Rs.54021.5.

The table indicated that on small herd size the average milk production, gross return from milk and dung, total gross return and net return was to be found 2675 ltr, Rs. 123050, Rs.22644, Rs.145694 and Rs.57052.7 per milch animal (buffalo)respectively.

In case of medium size of herd they receipt 2602 liter of milk per buffalo per year. This quantity of milk realized the gross return of Rs.117090 per year. The return or income receipt against the dung production was accounted to Rs.21922 per buffalo per annum with a net return of Rs. 50474..

On the other hand, in case of large size of herd they receipt 2745 liter of milk per buffalo per year. This quantity of milk realized the gross return of

Rs.123525 per year. The return or income receipt against the dung production was accounted to Rs.19710 per buffalo per annum, with a net return of Rs.53649.

**Cost of milk production per liter for milch buffalo on different herd size groups:**

To get the maximum profit from dairy enterprise it is necessary to estimate the economics of milk production per liter from different size of herd. As shown in table 4.13, the data were subjected to calculate cost of milk production as it is an important indicator of profitability per unit of output.

**Table: 4.13 Economics of milk production per liter for milch buffalo on Different herd size groups. (Rs./liter)**

| S.No. | Detail of economic  | Different herd size |        |       |         |
|-------|---|---------------------|--------|-------|---------|
|       |   | Small               | Medium | Large | Average |
| A)    | Cost of production (milk + dung) as per cost of maintenance | 30.12               | 30.95  | 29.66 | 29.94   |
| B)    | Marketing and 10% managerial charge                         | 3.012               | 3.093  | 2.97  | 2.99    |
| C)    | Total cost (A+B)  | 33.14               | 34.03  | 32.63 | 32.93   |
| D)    | Value of dung   | 2                   | 2      | 2     | 2       |
| E)    | Cost per liter of milk (C-D)                                | 31.13               | 32.02  | 30.63 | 30.93   |
| F)    | Sale price of milk  | 46                  | 45     | 45    | 45.3    |
| G)    | Net return per liter  | 14.86               | 12.97  | 14.36 | 14.36   |
| H)    | B.C. Ratio  | 1.51                | 1.40   | 1.5   | 1.46    |

Cost of production of milk per liter was estimated by subtracting value of dung. The result shows that the cost of milk production on sampled dairy farm was found to Rs.32.02 per liter on an average on medium size of herd which is maximum among the entire group followed by Rs.31.13 and 30.63 on small and large herd size respectively. The data shows that the cost of milk production per liter for milch buffalo was found to decreasing in increasing

size of herd. In nutshell, study depicted that overall on an average the cost of milk production on sampled dairy farm was found to Rs.30.93 per liter.

Thus, the net returns per liter of milk production were found to Rs.14.86, Rs.12.97 and Rs.14.36 on small, medium and large size of herd, respectively. In nutshell, study depicted that overall on an average the net returns per liter of milk production were found to Rs.14.36.

The B.C. ratio was found to be 1.51, 1.40 and 1.50 on small, medium and large size of herd and the overall average B.C. ratio was 1.46 respectively.

#### **4.3 Pattern of marketing of milk, marketing channels, price spread and marketing efficiency of milk.**

The remunerative market price of milk is must for development of dairy enterprise and farmers' economy. In some cases prices of produce are influenced by the market forces involved in marketing process. In study area the prevalent marketing patterns for sale of milk found at village level as well as sale in the out of village. There is one of the causes to select the site of marketing is quantity of produce have to be marketed. There are 4 main milk marketing channels are prevailing in the area i.e.

**Channel I:** Producer – General consumer

**Channel II:** Producer - Dairy shop – General consumer

**Channel III:** Producer - Itinerant traders / vendors – General consumer

**Channel IV:** Producer – Itinerant traders / vendors - Processor (Shop keeper)

The way in which the transactions for the disposal of milk take place in the market has assumed considerable importance not only for the farmer but for the dairy business as a whole.

#### **Marketing costs and marketing margins of different channels:**

To insure a higher share in consumer's rupee to the dairy farmers, the choice lies in the selection of a channel which is most remunerative amongst the existing marketing channels. Therefore, the study of marketing cost and margins assumes special significance in the area where marketing

infrastructure is less developed and the market is not perfect. Such studies are useful for understanding the market deficiencies and for suggesting measure for their improvement.

Marketing cost includes all the market charges involved for various marketing functions from the dairy farm to the final consumer. The chain of marketing cost and marketing margins of milk from producer to ultimate consumer is divided into following sub heads

1. Charges paid by the dairy farmers
2. Charges paid by Itinerant traders / vendors and dairy shop keeper
3. Total margins of Itinerant traders / vendors and dairy shop keeper
4. Price spread with different channels

The distribution of milk is the most important activity in the process of marketing. The farmers in general have to take positive steps to bring their produce to the attention of potential consumers in order to create a demand for them. The link between the producer and the consumer are varied; therefore, farmers have to select the suitable marketing channel. Table 4.14 presents the detail of marketing cost and margins of milk marketing at different marketing channels.

**Table: 4.14 Marketing cost and margins at different marketing channels of milk (Rs./liter)**

| S.No. | Particulars                                | Channels |      |     |     |
|-------|--|----------|------|-----|-----|
|       |  | I        | II   | III | IV  |
| 1.    | Producer's sale price                      | 48       | 46.5 | 45  | 45  |
| 2.    | Producer's marketing cost                  | 2.0      | 1.5  | -   | --  |
| 3.    | Net amount received by producer's          | 46       | 45   | 45  | 45  |
| 4.    | Dairy shop purchase price                  | --       | 45   | --  | --  |
| 5.    | Dairy shop marketing cost                  | --       | 1.0  | --  | --  |
| 6.    | Dairy shop margins                         | --       | 5.0  | --  | --  |
| 7.    | Dairy shop sale price                      | --       |      | --  | --  |
| 8.    | Itinerant traders / vendors purchase price | --       | --   | 45  | 45  |
| 9.    | Itinerant traders / vendors marketing cost | --       | --   | 2.0 | 2.5 |
| 10.   | Itinerant traders / vendors margins        | --       | --   | 5.0 | 4.5 |
| 11.   | Itinerant traders / vendors sale price     | --       | --   |     | 52  |
| 12.   | Processor purchaser price                  | --       | --   | --  | 52  |
| 13.   | General Consumer's purchaser price         | 48       | 51   | 52  | --  |

It is known fact that the milk reach to the consumers through different marketing intermediaries who taken a sizable portion of consumer's price as a market margin. The marketing cost incurred by each source or intermediary are included in the ultimate price, which varies considerably. Moreover, it also includes cost of marketing for rendering market services such as transportation, storage, retailing etc. Therefore, the share of producer in consumer's rupee depends on the channel followed by the producer in marketing of milk.

The study revealed that milk producer received the lowest price (Rs.45 per liter) when they sold the milk through itinerant traders / vendors (Channel III<sup>rd</sup> and channel IV<sup>th</sup>). This may caused producer's low share in consumer's

rupee as compared when producer's sale their produce in the market themselves. On the other hand, the milk producers received highest price (Rs.46 per liter) when they sold their milk themselves (Channel 1<sup>st</sup>) followed by all other channels.

The data revealed that among all the channels, on an average the milk producer received maximum net saving from selling the milk direct to consumer by themselves (Rs.46 per liter) i.e. channel 1<sup>st</sup>. Although, the farmers received net saving Rs.45 per liter through sell through other channels. Hence, the most important remunerative milk distribution channel (channel 1<sup>st</sup>) was found through farmers themselves to general consumer in which producers got average net return Rs.46 per liter followed by sale through dairy shop or sale through itinerant traders / vendors in which producers got average net return Rs.45 per liter from each channel. In order to secure a remunerative price, farmer takes maximum of their produce to the market for disposal through themselves.

#### **Price spread of different marketing channels:**

It was found in study that marketing cost and marketing margins was directly related to frequency of middle men. It is known fact that bigger the chain higher would be the marketing cost and ultimately the producer's share in consumer's rupee becomes the lower. It is said that marketing of milk, in general is more expensive than the distribution of other products due to perishable which direct affects the producer net price.

The details of average price spread in marketing of milk in different marketing channels have been presented in table 4.15.

**Table: 4.15 Price spread in marketing of milk in different channel.****(Percent)**

| S.No.     | Particulars                                  | Channel                      |                              |                              |                              |
|-----------|--|------------------------------|------------------------------|------------------------------|------------------------------|
|           |  | I                            | II                           | III                          | IV                           |
| <b>A.</b> | <b>Marketing Cost</b>                        | <b>2.0</b><br><b>(4.10)</b>  | <b>2.5</b><br><b>(5.00)</b>  | <b>2.0</b><br><b>(3.84)</b>  | <b>2.5</b><br><b>(4.80)</b>  |
| 1.        | Producers                                    | 2.0<br>(4.10)                | 1.5<br>(3.00)                | --                           | --                           |
| 2.        | Dairy shop                                   | --                           | 1.0<br>(1.9)                 | --                           | --                           |
| 3.        | Itinerant traders / vendors                  | --                           | --                           | 2.0<br>(3.84)                | 2.5<br>(4.80)                |
| <b>B</b>  | <b>Marketing Margins</b>                     | --                           | <b>5.0</b><br><b>(9.80)</b>  | <b>5.0</b><br><b>(9.61)</b>  | <b>4.5</b><br><b>(8.65)</b>  |
| 1.        | Dairy shop                                   | --                           | 5.0<br>(9.80)                | --                           | --                           |
| 2.        | Itinerant traders / vendors                  | --                           | --                           | 5.0<br>(9.61)                | 4.5<br>(8.65)                |
| <b>C.</b> | <b>Total cost + margin</b>                   | <b>2.0</b><br><b>(4.10)</b>  | <b>7.5</b><br><b>(14.70)</b> | <b>7.0</b><br><b>(13.46)</b> | <b>7.0</b><br><b>(13.46)</b> |
| <b>D.</b> | <b>Producer's share in consumer's rupees</b> | <b>46</b><br><b>(95.83)</b>  | <b>45</b><br><b>(88.23)</b>  | <b>45</b><br><b>(86.53)</b>  | <b>45</b><br><b>(86.53)</b>  |
| <b>E.</b> | <b>Consumer's purchase price (Rs./liter)</b> | <b>48</b><br><b>(100.00)</b> | <b>51</b><br><b>(100.00)</b> | <b>52</b><br><b>(100.00)</b> | <b>52</b><br><b>(100.00)</b> |
| <b>F.</b> | <b>Price Spread (%)</b>                      | <b>(4.10)</b>                | <b>(14.70)</b>               | <b>(13.46)</b>               | <b>(13.46)</b>               |

**Figure in parentheses show the respective percentage**

As it is discussed that producer gets minimum net price per liter of milk marketing in case of sell themselves (Producer - Dairy shop – General consumer) or to Itinerant traders / vendors i.e. (Producer - Itinerant traders / vendors – General consumer) and (Producer – Itinerant traders / vendors - Processor (Shop keeper)).

Among all the channels the producers share in consumer's rupees was highest 95.83 per cent in case when milk was sell through farmers themselves to direct general consumer (channel I<sup>st</sup>). On the other hand, the producers share in consumer's rupees was minimum 86.53 per cent in case when milk was sell through Producer - Itinerant traders / vendors – General consumer (channel III<sup>rd</sup>) and Producer – Itinerant traders / vendors - Processor (Shop

keeper) (channel IV<sup>th</sup>). Study also revealed that producers share in consumer's rupees was nominal 88.23 per cent in case when milk was sell through producer to shopkeeper (channel II<sup>nd</sup>).

**Milk marketing efficiency:**

The detail information of marketing efficiency of milk has been presented in table 4.16.

**Table 4.16: Marketing efficiency of milk marketed through different marketing channels.**

(Rs. /liter)

| Particulars                           | Channel |     |      |      |
|---------------------------------------|---------|-----|------|------|
|                                       | I       | II  | III  | IV   |
| Value of goods sold or consumer price | 48      | 51  | 52   | 52   |
| Marketing cost +marketing margin      | 2       | 7.5 | 7    | 7    |
| Marketing efficiency                  | 24      | 6.8 | 7.42 | 7.42 |

An efficient marketing system is an effective agent of change and an important means for raising the income level of the farmers through sale of their produce. On the other hand, it is also considerable that movement of milk from producers to consumers at the lowest possible marketing cost and margins may be termed as efficient marketing. On the basis of above facts, the above data indicates that the marketing efficiency of milk was found to be the highest i.e. 24 in case of channel I<sup>st</sup> (sale themselves to general consumer) in which the marketing cost and margin found to be the lowest and the producers got the highest net price of per liter of milk.

In case of milk marketing through channel III<sup>rd</sup> and IV<sup>th</sup> i.e. Producer - Itinerant traders / vendors – General consumer, and itinerant traders / vendors to processor and shopkeeper, the marketing of milk was observed next important i.e. marketing efficiency was found to be 7.42 and channel II<sup>nd</sup> having less marketing efficiency i.e. 6.8 respectively.

#### 4.4 Constraints faced by dairy farmers:

Some of the constraints faced by dairy farmers have been presented in table 4.17. The constraints analysis was reported based on the opinion survey of the sample farmers.

**Table: 4.17 Constraints faced by the sample farmers in milk production.**

**(N=60)**

| S.No. | Constraints                                   | Frequency | %     | Rank               |
|-------|---|-----------|-------|--------------------|
| 1.    | Exogenous factors                             | 33        | 55    | VIII <sup>th</sup> |
| 2.    | Scarcity of family labour                     | 35        | 58.3  | VII <sup>th</sup>  |
| 3.    | High cost of hired labour                     | 42        | 70    | V <sup>th</sup>    |
| 4.    | Scarcity of owned funds                       | 24        | 40    | X <sup>th</sup>    |
| 5.    | Non availability of alternative sources       | 26        | 43.3  | IX <sup>th</sup>   |
| 6.    | High cost of inputs                           | 43        | 71.6  | IV <sup>th</sup>   |
| 7.    | Non availability of quality feeding materials | 49        | 81.6  | III <sup>rd</sup>  |
| 8.    | Lack of technical guidelines                  | 57        | 95    | I <sup>st</sup>    |
| 9.    | Low yield of local breeds                     | 56        | 93.3  | II <sup>nd</sup>   |
| 10.   | Lack of market information                    | 42        | 70    | V <sup>th</sup>    |
| 11.   | High marketing cost                           | 41        | 68.33 | VI <sup>th</sup>   |
| 12.   | Low price for the produce                     | 56        | 93.3  | II <sup>nd</sup>   |
| 13.   | Poor transportation facility                  | 06        | 10    | XI <sup>th</sup>   |
|       | Total average                                 | 39.23     | 65.53 |                    |

**\* Higher than average value**

For effective planning to develop dairy enterprise, it is not only required to assess the constraints but it is also necessary to assess the extent or seriousness of constraints. Hence, an attempt was made for identifying the constraints as serious constraints (having higher than average value) and normal constraints (having lower than average value).

The main constraints confronted by dairy farmers under serious constraints were " Lack of technical guidelines " confronted by (95.00%) followed by " Low price for the produce & Low yield of local breeds confronted by (93.30% Second rank), "non availability of quality feeding materials" confronted by (81.60%), "high cost of inputs" confronted by (71.6%), " Lack of market information " confronted by (70.0%), " High marketing cost " confronted by (68.33%) and "scarcity of family labour due to involvement in the non farming activities/ high cost of hired labour" confronted by (58.3%) respectively.

On the other hand, the normal constraints confronted by dairy farmers under this constraint were "Exogenous factors, Non availability of alternative sources, Scarcity of owned funds and Poor transportation facility with 55.00%, 43.3%, 40.0% and 10.00% respectively.

#### **4.6. Factor affecting the milk production**

Table 4.18 shows the factors responsible for low milk production in the study area. 100 percent farmers ranked first to feed and fodder followed by temperature, marketing cost, marketing channel and weather with Second, third, fourth and fifth rank respectively.

**Table 4.18: factors affecting the milk production**

| <b>S.No</b> | <b>Factors</b>    | <b>Frequency</b> | <b>Percentage (%)</b> |
|-------------|-------------------|------------------|-----------------------|
| 1.          | Weather           | 11               | 18.33                 |
| 2.          | Feed / fodder     | 60               | 100                   |
| 3.          | Temperature       | 43               | 71.66                 |
| 4.          | Marketing channel | 18               | 30.00                 |
| 5.          | Marketing cost    | 24               | 40.00                 |
|             | Average           | 31.2             | 52                    |

## **Chapter - V**

### **DISCUSSION**

In this chapter result's finding has been discussed in detail to get the conclusive remarks about stated objectives of the study. This study mainly has been divided into two other sub heads i.e. to examine the cost and return structure of dairy enterprise with special emphasis on cost of milk production and marketing economic efficiency. Hence, the understanding of the economics of milk production and milk marketing in different marketing channels prevailing in the area is having its own importance.

With the context of cost and return of buffalo milk production of dairy farmers first we discussed about basic information of herd size of the study area. Study revealed that the phenomena with regards to dairy enterprise would be related more by the middle and old aged group. In response to education of dairy farmers, this lead to the understanding that the phenomena with regards to dairy enterprise would be related more by the literate persons and among them maximum number of dairy farmers educated upto college level.

The size and type of family composition is more realistic in agriculture enterprise because mostly farmers and dairy farmers are utilizing family labour for various operational and managerial works. This lead to the understanding that the phenomena with regards to size of family the maximum size of family was found with large size of herd followed by with medium and small size of herds. On the other hand, this is also leads to the understanding that the phenomena with regards to type of family the maximum nuclear family was found with small and large size of herd followed by with large size of herds.

It is evident from the data that the average size of holding with small size of herd farmers represents to 1.72 hectare per farm followed by 3.70 average hectares with medium farmers and 6.0 average hectares with dairy farmers of large size of herd. Apart from size of land holding the economy of dairy family is also depend on size of herd composition. Study revealed that average strength of buffaloes in small size of herd was found to be 2.35 per

unit followed by medium size of herd was found to be 4.90 per unit and large size of herd was found to be 7.20 per unit respectively.

It is well known fact that economic analysis of any enterprise requires the costs incurred into fixed assets and variable/operating costs. The same is true for costs on milch animals maintained by the sample farmers in this study. The over head charge on total fixed capital incurred in per unit of dairy per annual basis has been considered as per review of literature available. On the other hand, the working capital has been considered as total operational expenses incurred in maintaining the milch animal per annual basis.

Economists are generally interested with low cost involvement in production process. Hence, the information regarding total cost of production per unit of dairy and per animal per annum incurred is pertinent to make it possible to reduce the cost of milk production per liter. In present study the total cost estimates i.e. cost C was determine for maintenance of per buffalo per annum. Study revealed that cost C was found Rs.79582, Rs.79795 and Rs. 80883 per buffalo per annum on small, medium and large herd size respectively with an average of Rs. 79627.

Profitability from enterprise found to depend on quantity of total milk production and their respective market price. The gross return of any enterprise is considered the total receipt by selling of its produce. The return or income of dairy unit realized through selling the milk. It could be seen from the data that average milk production per milch animal (buffalo) was found to 2682 liter per year, in case of small, medium and large size of herd it is 2675, 2602, and 2745 liter respectively. This quantity of milk realized the gross return of Rs.142353 per year, this average gross return is considered the total receipt by selling of milk and dung per buffalo per annum. In case of small, medium and large size of herd they receipt the gross return of Rs.145694, Rs.139012 and Rs. 143235 per year/buffalo.

The net income from any enterprise is the profit which return by operation of the units and it is the real income which farmers got as remuneration of their business. For economics of dairy unit net return per buffalo per annum from different size of herd also calculated. Study revealed

that the maximum net return Rs.57052.7 per buffalo per annum was realized from small size of herd followed by Rs.53650 per buffalo per annum was realized from large size of herd. On the other hand, the minimum net return Rs.50474.1 per buffalo per annum was realized from medium size of herd.

To insure a higher share in consumer's rupee to the dairy farmers, the choice lies in the selection of a channel which is most remunerative amongst the existing marketing channels. It was found in study that marketing cost and marketing margins was directly related to frequency of middle men or intermediaries. It is known fact that bigger the chain higher would be the marketing cost and ultimately the producer's share in consumer's rupee becomes the lower. It is said that marketing of agricultural product, particularly in milk marketing, in general is more expensive than the distribution of other products because of the fact due to perishable in nature.

There are 4 main milk marketing channels are prevailing in the area.

**Channel I:** Producer – General consumer

**Channel II:** Producer - Dairy shop – General consumer

**Channel III:** Producer - Itinerant traders / vendors – General consumer

**Channel IV:** Producer – Itinerant traders / vendors - Processor (Shop keeper)

The study revealed that milk producer received the lowest price (Rs.45 per liter) when they sold the milk through, shopkeeper/itinerant traders / vendors (Channel II<sup>nd</sup>III<sup>rd</sup> and channel IV<sup>th</sup>). This may caused producer's low share in consumer's rupee as compared when producer's sale their produce in the market themselves. On the other hand, the milk producers received highest price (Rs.46 per liter) when they sold their milk themselves (Channel I<sup>st</sup>).

Marketing efficiency is essentially the degree of market performance. Marketing efficiency of milk production determine the effectiveness of marketing process performance it designated function. A reduction in marketing cost without reduction in consumer satisfaction is must for size of business and level of profitability, hence, needs to be study of milk marketing efficiency in different channel prevailing in the area. Study revealed that the

marketing efficiency of milk was found to be the highest i.e. 24 in case of channel I<sup>st</sup> (sale themselves to general consumer) in which the marketing cost and margin found to be the lowest and the producers got the highest net price of per liter of milk. In case of milk marketing through itinerant traders / vendors to processor and shopkeeper, the marketing of milk was observed next important i.e. marketing efficiency was found to be 7.42 in channel IV<sup>th</sup> and III<sup>rd</sup> followed by marketing efficiency was found to be 6.8 in case of channel II<sup>nd</sup> respectively. Data shows that there is need to be increase marketing efficiency of milk marketing in the area.

## Chapter –VI

### SUMMARY, CONCLUSION AND SUGGESTIONS FOR FURTHER WORK

#### 6.1 Summary: -

The main objective of the study entitled “An economic analysis of costs and returns of buffalo milk production in Gwalior District of Madhya Pradesh” is to find out the cost incurred in maintenance of buffaloes and income realized by dairy enterprise in the process of milk production and its marketing in different size of herd. The specific objectives of the study were as follows:

#### Objectives:

- To work out the cost and return of buffalo milk production in the study area.
- To study the marketing pattern of milk i.e. marketing channels, price spread, and marketing efficiency
- To determine the factors affecting of the milk production.
- To identify the constraints faced by milk producer in the study area.

The study has been conducted in Gwalior district of Madhya Pradesh. Multistage sampling technique was used for drawing a sample for the present study. There are totally four block in Gwalior district namely: Bhitwarwar ,moror, ghatigaon and dabra. Out of these blocks, moror block have been selected purposively due to highest number of buffalo milk producers for the study. A list of the villages of Moror block was prepared with the help of block personnel. Out of these, ten villages were selected randomly. In these villages buffalo milk producers categorized into three different herd group having unit size i.e. small buffalo milk producers (less than 3 buffaloes), medium buffalo milk producers (3-6 buffaloes) and large buffalo milk producers (more than 6 buffaloes). A list of buffalo milk producers in selected villages was prepared separately as category wise. From these list from these list six buffalo milk producers from each category was selected from each village randomly. Thus, 20 buffalo growers in each category was the sample of the study.

Therefore, the total 60 buffalo milk producers were taken into consideration for study from 10 villages in moror block of district Gwalior.

Primary data was collected from sample dairy farms. The data was collected using survey method. The data on different aspects were collected through pre-tested interview schedule. Each of the selected dairy farmers was approached personally for recording relevant data. All the collected primary data was related to the agricultural year 2017-18.

On the basis of raw data obtained regarding cost and return from dairy enterprise, the data on cost concept and returns in milch production was calculated as per economic and statistical values.

## **6.2 Conclusions:-**

Following conclusions have been drawn from stated objectives of study:

1. The average size of holding with small size of herd farmers represents to 1.72 hectare per farm followed by 3.70 average hectares with medium farmers and 6.0 average hectares with dairy farmers of large size of herd.
2. Study revealed that average strength of buffaloes in small size of herd was found to be 2.35 per unit. In respect of average price of milch animal (buffaloes) for this group it was accounted Rs.57000 per buffalo. The strength of buffaloes in medium size of herd was found to be 4.90 per unit. In respect of average price of milch animal (buffaloes) for this group it was accounted Rs.59750 per buffalo. The strength of buffaloes in large size of herd was found to be 7.20 per unit. In respect of average price of milch animal (buffaloes) for this group it was accounted Rs.60375 per buffalo.
3. Study shows that an average total fixed cost was found to be Rs.295182 per unit and Rs.125608 per buffalo in small size of herd followed by Rs.524024 per unit and Rs.106943, and Rs.640252 per unit and Rs.87878 per buffalo on medium and large size of herd respectively.
4. The total overhead charges on fixed assets to maintain the dairy herd revealed that in case of small herd size Rs.1902 per buffalo per annum followed by Rs.1697, Rs.1362 per buffalo per annum on medium and large

herd size farmers respectively. It is revealed that the overall overhead cost of fixed assets found to decrease with increasing size of herd.

5. The average total cost on feed and fodder in case of small dairy farmers was accounted Rs.22781 per buffalo per annum followed by Rs.22430 and Rs.22478 per buffalo per annum on medium and large herd size respectively.
6. The total average cost on labour and miscellaneous expenses was accounted Rs.38017 per buffalo per annum in small size of herd while; it was Rs.38732 per buffalo per annum on medium size of herd and Rs.41065 per buffalo per annum in case of large size of herd.
7. It is revealed that the overall average operational cost i.e. cost A was found to highest in case of large size of herd, accounted Rs.59298 per buffalo per annum followed by Rs.53117 per buffalo per annum in case of medium size of herd and Rs.36665 per buffalo per annum in case of small size of herd respectively.
8. Study revealed that cost C was found to highest in case of large size of herd, accounted Rs.80883 per buffalo per annum followed by Rs.79795 and Rs.79582 per buffalo per annum on medium and small size of herd respectively.
9. It could be seen from the data that average milk production per milch animal (buffalo) was found to 2675 liter, 2602 liter, 2745 liter per year in case of small, medium and large size of herd. This quantity of milk realized the total gross return of Rs.145694, Rs.139012 and Rs.143235 per year on respective herd size groups.
10. Study revealed that the minimum net return Rs.50474 per buffalo per annum was realized from medium size of herd followed by Rs.53650 and Rs.57052 per buffalo per annum was realized on medium and small size of herd.
11. The result shows that the cost of milk production on sampled dairy farm was found to Rs.32.02 per liter on an average on medium size of herd which is maximum among the entire group. Similarly it was found Rs. 31.13 and Rs.30.63 per liter on small and large herd size respectively.

12. As explained above, the price realized for sale of milk was the lowest on large farms and it increased as the farm size decreased. Thus, the net returns per liter of milk production were found to Rs.14.86, Rs.13.0 and Rs.14.36 on small, medium and large size of herd, respectively. The B.C. ratio was 1.51, 1.40 and 1.50 on small, medium and large size of herd, respectively.

13. There are 4 main milk marketing channels are prevailing in the area.

**Channel I:** Producer – General consumer

**Channel II:** Producer - Dairy shop – General consumer

**Channel III:** Producer - Itinerant traders / vendors – General consumer

**Channel IV:** Producer – Itinerant traders / vendors - Processor (Shop keeper)

14. The study revealed that milk producer received the lowest price (Rs.45 per liter) when they sold the milk through shopkeeper/ itinerant traders / vendors (Channel II<sup>nd</sup> Channel III<sup>rd</sup> and channel IV<sup>th</sup>). This may caused producer's low share in consumer's rupee as compared when producer's sale their produce in the market themselves. On the other hand, the milk producers received highest price (Rs.46 per liter) when they sold their milk themselves (Channel I<sup>st</sup>).

15. The data revealed that among all the channels, on an average the milk producer received maximum net saving from selling the milk direct to consumer by themselves (Rs.46 per liter) i.e. channel I<sup>st</sup>. Although, the farmers received net saving Rs.45 per liter through sell channel II<sup>nd</sup>, channel III<sup>rd</sup> and channel IV<sup>th</sup> also while they are selling milk through itinerant traders / vendors.

Among all the channels the producers share in consumer's rupees was highest 95.83 per cent in case when milk was sell through Channel I: Producer – General consumer, followed by 88.23 percent via Channel II: Producer - Dairy shop – General consumer and 86.53 percent each by Channel III:

Producer - Itinerant traders / vendors – General consumer and Channel IV: Producer – Itinerant traders / vendors - Processor (Shop keeper) respectively. The data indicates that the marketing efficiency of milk was found to be the highest i.e. 24 in case of channel I<sup>st</sup> (sale themselves to general consumer) in which the marketing cost and margin found to be the lowest and the producers got the highest net price of per liter of milk.

**16.**In case of milk marketing through Channel III: Producer - Itinerant traders / vendors – General consumer and Channel IV: Producer – Itinerant traders / vendors - Processor (Shop keeper), the marketing of milk was observed next important i.e. marketing efficiency was found to be 7.42 followed by marketing efficiency was found to be 6.8 in case of channel II<sup>nd</sup> respectively.

**17.**The main constraints confronted by dairy farmers under serious constraints were "Lack of technical guidelines" confronted by (95.00%) followed by " Low yield of local breeds " Low price for the produce both confronted by (93.3%), "non availability of quality feeding materials" confronted by (81.6%), " High cost of inputs " confronted by (71.6%), " High cost of hired labour " confronted by (70.0%), " High marketing cost " confronted by (68.3%) and "scarcity of family labour due to involvement in the non farming activities/ high cost of hired labour" confronted by (58.3%) respectively.

### **6.3 Suggestions for further work:**

On the basis of above conclusions following suggestions may be recommended:

- 1.** The study come out to be the fact that the net returns in milk production of the large dairy farms are found much higher than the small and medium dairy farms; Moreover large dairy farms are providing employment to the hired labour also. Therefore, it is a need to encourage the small and medium dairy farms by to expand their dairy farms providing cheaper loans so that socio-economic status of the poor can be uplifted and overall employment opportunities can be expanded.

2. It is suggested that better results could be obtained if arrangements are made by the government for the regular supply of green fodder and concentrates at cheaper rates. It is desirable and will be helpful if the government distributes animal feeds and fodder at subsidized rate to milk producers through the Milk producer's society. The government should also take necessary steps to reserve adequate acreage of suitable land for raising fodder, in order to arrest the rise in prices. It is also suggested that the government should instruct the banks to give more loans at appropriate time on par with agricultural loan and rate of interest to the people who are involved in dairy development activities especially for the purchase of milch animals.
3. The milch animal owners should be given necessary education and training by the government to understand and practice more advanced technique and scientific methods in milk production. The government and Non Governmental Organizations should organize veterinary medical camps frequently for the benefit of milk producers in rural areas to escape from seasonal and epidemic diseases.
4. As maximum quantity of milk produced is marketed by the dairy farmers, it shows that dairy animals were raised for income purpose. The efforts made for efficiency in milk collection, storage and processing will further help the farmer to raise their income.
5. As selling price of milk varies according to the agencies in which milk is disposed off, an effective mechanism has to be developed to regulate the price of milk based on quality and faster payment mode for the interest of the milk producers.

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**APPENDICES**  
**AGRICULTURAL ECONOMICS**  
**COLLEGE OF AGRICULTURE, GWALIOR (M.P.)**

**QUESTION SCHEDULE**

**Title of the Research Problem:**

An economic analysis of costs and returns of buffalo milk production in Gwalior District of Madhya Pradesh.

**Name of Guide**

**Dr. A.M.Jaulkar**

**Name of investigator**

**SandeepSharma**

**INTERVIEW SCHEDULE**

**(1) General information of the respondent:**

**General Information:**

- Dairy farmer Name: .....
- Father Name... ..
- Age (Year) .....
- Cast :- (Gernal / OBC/ SC/ST)
- Education: - .....
- Family type :- (Joint / Nuclear)
- Village: - .....

| Adult Male   | Number | Age(yrs ) | Education | Working on farm(No.) | Working outside farm(No.) | Annual Income (Rs.) |
|--------------|--------|-----------|-----------|----------------------|---------------------------|---------------------|
| Adult Female |        |           |           |                      |                           |                     |
| Children     |        |           |           |                      |                           |                     |
| Total        |        |           |           |                      |                           |                     |

## 2. Buffalo composition, milk production

| S. No. | Animal type | No. | Value of the animal at the time of purchase | Milk production (lit/day) | Milk sales(Lit/day) | Total value Rs |
|--------|-------------|-----|---|---------------------------|---------------------|----------------|
| 1      | Local       |     |   |                           |                     |                |
| 2      | Cross Breed |     |   |                           |                     |                |
|        | TOTAL       |     |   |                           |                     |                |

### 3. Pattern of investment in dairy enterprise:

| S. No | Particulars   | Total quantity | Total cost(Rs) |
|-------|---|----------------|----------------|
| 1     | FEED AND FODDER COST <ul style="list-style-type: none"><li>• Dry fodder</li><li>• green fodder</li><li>• Concentrates</li></ul> |                |                |
| 2     | Water   |                |                |
| 3     | Electricity   |                |                |
| 4     | Insemination  |                |                |
| 5     | Medicine  |                |                |
| 6     | Veterinary services   |                |                |
| 7     | and supervision   |                |                |
|       | Building repairs  |                |                |
| 8     | Machinery repairs   |                |                |
| 9     | Others  |                |                |
|       | <b>Total</b>  |                |                |

### 4. Pattern of investment in dairy enterprise:

| S.NO | Items of investment  | VALUE |
|------|----------------------|-------|
| 1.   | Sheds including land |       |
| 2.   | Bore well/well       |       |
| 3.   | Electricity          |       |
| 4.   | Milking equipments   |       |

|    |                     |  |
|----|---------------------|--|
| 5. | Miscellaneous items |  |
|    | <b>Total cost=</b>  |  |

**5. Labour charges In Dairy:**

| S.NO | Particulars            | Labour (Nos) |       |               |       | Wage rate(Rs/man/day) |       |
|------|------------------------|--------------|-------|---------------|-------|-----------------------|-------|
|      |                        | Hired labour |       | Family labour |       | Men                   | WOMEN |
|      |                        | MAN          | WOMEN | MEN           | WOMEN |                       |       |
| 1    | Roughage collection    |              |       |               |       |                       |       |
| 2    | Grazing                |              |       |               |       |                       |       |
| 3    | Stall feeding          |              |       |               |       |                       |       |
| 4    | Cleaning of            |              |       |               |       |                       |       |
| 5    | sheds                  |              |       |               |       |                       |       |
|      | Cleaning of            |              |       |               |       |                       |       |
| 6    | animals                |              |       |               |       |                       |       |
|      | Milking                |              |       |               |       |                       |       |
| 7    | Transportation of milk |              |       |               |       |                       |       |
|      | OTHERS                 |              |       |               |       |                       |       |
|      | <b>TOTAL</b>           |              |       |               |       |                       |       |

## 6. Returns from Dairy:

| S.NO | Particulars                | unit | Total quantity | Price/unit | Total value(Rs) |
|------|----------------------------|------|----------------|------------|-----------------|
| 1    | Milk production            | Lit. |                |            |                 |
| 2    | Dung production            | CL   |                |            |                 |
| 3    | Sale of males              | NO.  |                |            |                 |
| 4    | Sale of calves             | NO.  |                |            |                 |
| 5    | Sale of dry/culled animals | NO.  |                |            |                 |
|      | <b>Total</b>               |      |                |            |                 |

## 7. Marketable and marketed surplus:-

| S.NO | Particulars           | Quantity / lit. / buffalo |
|------|-----------------------|---------------------------|
| 1    | Total Milk Production |                           |
| 2    | Consumption Milk      |                           |
| 3    | Family use            |                           |
| 4    | Marketable surplus    |                           |
| 5    | Actual Marketed       |                           |

## 8. Marketing channels for buffalo milk.

- (i) Channel I: producer - consumer
- (ii) Channel II: producer - Itinerant traders / vendors - consumer
- (iii) Channel III: producer – Itinerant traders / vendors - dairy shop - consumer
- (iv) Channel IV: producer - dairy shop – consumer
- (v) Channel V: producer – co-operative – consumer

## 9. Constraints

- 1. Exogenous factors: - \_\_\_\_\_yes/no
- 2. Scarcity of family labour due to involvement in the non farming activities/  
high cost of hiredlabour :- \_\_\_\_\_yes/no
- 3. Scarcity of owned funds: - \_\_\_\_\_yes/no
- 4. Non availability of alternative sources:- \_\_\_\_\_yes/no
- 5. High cost of inputs:- \_\_\_\_\_yes/no
- 6. Non availability of quality feeding materials:- \_\_\_\_\_yes/no
- 7. Lack of technical guidelines:- \_\_\_\_\_yes/no
- 8. Low yield of local breeds:- \_\_\_\_\_yes/no
- 9. Lack of market information: - \_\_\_\_\_yes/no
- 10. High marketing cost:- \_\_\_\_\_yes/no
- 11. Low price for the produce:- \_\_\_\_\_yes/no
- 12. Poor transportation facility:- \_\_\_\_\_yes/no

## 10. Factors affecting milk production

- a).....
- b).....
- c).....
- d).....
- e) .....
- f) .....

## VITA

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|-------------------------------|---------------------------------|--------------------------|------|------|
| M.sc(Ag)                      | RVSKVV                          | Agriculture<br>economics | 2020 | 67.5 |
| B.sc. (Ag)                    | ITM UNIVERSITY,<br>GWALIOR(M.P) | Agriculture              | 2017 | 80.7 |
| Higher<br>Secondary<br>(10+2) | M.P. Board, BHOPAL              | BIOLOGY                  | 2010 | 72   |
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