“Critical Analysis of Risk Management Involved in Maintenance of Livestock and its Effect on Rural Economy”

Thesis submitted to

Savitribai Phule Pune University, Pune

For the Award of Degree of

DOCTOR OF PHILOSOPHY

In **Commerce**

Under the Board of Studies of

Business Administration

Submitted By

Dr. Vivek Hindurao Ksheersagar

Research Student

Under the Guidance of

Dr. S. K. Pole

Research Guide

Research Centre

M. C. E. Society’s
Abeda Inamdar Senior College of Arts, Science & Commerce,
Pune 411001

November 2018

This Research Work is dedicated to

Lord Gopal Krishna

M.C.E. Society's
ABEDA INAMDAR SENIOR COLLEGE
RESEARCH CENTRE IN COMMERCE
2390-B, K.B.Hidayatullah Road, Azam Campus,Camp, Pune- 411001, Tel. No. 020-65228257

Dr. E. M. Khan
Principal

Dr. Shaila Bootwala
Director, Research Centre in Commerce
Vice Principal & H.O.D. of Commerce Dept.

Ref. No./- MSC/717/Ph D/2018

Date: 30 - 10 - 2018

CERTIFICATE OF THE INSTITUTE

Certified that the work incorporated in the thesis "Critical Analysis of Risk Management Involved in Maintenance of Livestock and its effect on Rural Economy" submitted by KSHEERSAGAR VIVEK HINDURAO was carried out by the candidate at this Centre. Such material obtained from other sources has been duly acknowledged in the thesis and plagiarism (under 10%) is well within acceptable limits of the University.

Pune

Dr. Shaila Bootwala
Director, Research Centre in Commerce

DIRECTOR
Abeda Inamdar Senior College
Research Centre in Commerce

Date: 30 - 10 - 2018

ABEDA INAMDAR SENIOR COLLEGE CAMP PUNE-1

M.C.E. Society's
ABEDA INAMDAR SENIOR COLLEGE
RESEARCH CENTRE IN COMMERCE
2390-B, K.B.Hidayatullah Road, Azam Campus,Camp, Pune- 411001, Tel. No. 020-65228257

Dr. F. M. Khan
Principal

Dr. Shaila Bootwala
Director, Research Centre in Commerce
Vice Principal & H.O.D. of Commerce Dept.

Ref. No./- ARSC/717/Ph-D/2018

Date: 30 - 10 - 2018

CERTIFICATE OF GUIDE

Certified that the work incorporated in the thesis "Critical Analysis of Risk Management Involved in Maintenance of Livestock and its effect on Rural Economy" submitted by **KSHEERSAGAR VIVEK HINDURAO** was carried out by the candidate under my supervision and guidance. Such material as has been obtained from other sources has been duly acknowledged in the thesis.

Dr. S. K. Pole
Guide Signature

Place: Pune

Date: 30 - 10 - 2018

ABEDA INAMDAR SENIOR COLLEGE CAMP PUNE-1

DECLARATION

I hereby declare that the thesis entitled **"Critical Analysis of Risk Management Involved in Maintenance of Livestock and its Effect on Rural Economy"** completed and written by me has not previously formed the basis for the award of any degree or other similar title upon me of this or any other university or examining body.

I further declare that such material as has been obtained from other sources has been duly acknowledged in the thesis.

Place: Pune

Date: November 2018

Dr. Vivek Hindurao Ksheersagar
Research Student

ACKNOWLEDGEMENTS

It is with deep sense of gratitude that I acknowledge the inspiration, encouragement and guidance given to me by my research guide Dr. S. K. Pole, Principal, S.B.B. alias Appasaheb Jedhe Arts, Commerce & Science College, Shukrawar Peth, Pune 411002 , Maharashtra (India) His suggestions, constant advice, pursuit for perfection, meticulous detailing have helped me in completing this research work.

I am sincerely thankful to Dr. Shaila Bootwala, Coordinator and Vice Principal, Abeda Inamdar College, and Research Centre, Camp, Pune for her active support and guidance in completing this research. I express my sincere thanks to Shri Vishnu Hinge, Chairman, Pune Zilha Sahakari Dudh Utpadak Sangh Maryadit, Pune for his encouragement to accomplish this research work.

My thanks are also due to the librarians of Dept. of Commerce and Research Centre of University of Pune, Jayakar Library, University of Pune for their valuable support in getting the requisite reference books.

I am thankful to my senior colleagues and the staff of Katraj Dairy for their valuable assistance in completing this research work. I am also thankful to the respondent dairy farmers and the dairy societies for their valued cooperation in data collection without which this research would not have been complete.

I am thankful to Mr. Sameer Rajopadhye of M/s. Sameer Copiers, Pune for timely typing and neatly presenting this research work.

I express my indebtedness to my Mrs. Varsha, and daughter Mrs. Geeta and Son in law Mr. Padmsingh Jadhav, my granddaughters – Keiva and Krishna for their wholehearted support and for the sacrifice, they have made in relieving me for this research work.

Dr. Vivek Hindurao Ksheersagar

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVATIONS USED

Abbreviation	Full form
Bn	Billion
BPO	Business Process Outsourcing
CCCC	Community Cattle Care Centre
DPA	Draught Prone Area
F.Y.P.	Five Year Plan
FAO	Food and Agriculture Organization
FYM	Farm Yard Manure
GDP	Gross Domestic Product
Govt.	Government
HRD	Human Resources Department
ICT	Information Communication Technology
IDF	International Dairy Federation
MIDC	Maharashtra Industrial Development Corporation
NABARD	National Bank for Agriculture and Rural Development
NCDFI	National Cooperative Diary Federation of India Ltd.
NDDB	National Dairy Development Board
NPA	Non-Performing Assets
PRI	Panchayat Rajya Institution
RBI	Reserve Bank of India
SC	Scheduled Castes
SMP	Skim Milk Powder
ST	Scheduled Tribes
UP	Uttar Pradesh
US	United States

CHAPTER – I
INTRODUCTION

1.1 INTRODUCTION

Indian economy is predominantly dominated by the agriculture sector. Agriculture plays a pivotal role in giving boost to the Indian economy. In India the major agriculture activity is being carried out in traditional manner. This is reflected in its yield of various crops. As compared to the world standards of yield of various crop our yield of every crop per Ha is very less and the need of the hour is to make conscious efforts for improving the yield for which the agriculturists will have to adopt modern techniques.

1.2 HISTORICAL PERSPECTIVE OF LIVESTOCK IN THE INDIAN AGRICULTURE SECTOR

From the ancient time of human civilization, where the process of rearing the domestic animals evolved, amongst all the other useful animals the cattle and buffaloes were always on top in the hierarchy. Because of this order, where cattle had more importance, the richness of any individual was calculated on the no. of good animals he owned and relatively on their productiveness in terms of milk. In accordance with any religion the cow has as aesthetic value. There are many spiritual stories in the Indian History that states that "cow comprises of 33 crores of different Gods and Goddesses whereas the male buffalo being the vehicle of "Yama", who is considered the God who takes the life away from living. Also the male cattle Nandi" is the vehicle of "Lord Shiva", who represents death and distortion Because cow is involved from breeding to feeding process practiced in human civilization she symbolizes the nature goddess Earth.

Earlier in the time of human civilization the culture of utilizing the services of the livestock was practiced for thousands of years they were using very strict & scientific breeding technique where land was made available for grazing of cattle's

and the milk produced by then was either used directly for drinking while the form of by products like butter, ghee etc. were used in Vedic methodologies.

In context of the lord Krishna‟s period the people of those times used to take the curd & butter from Vrindawn to Mathura. At those times also, the practices were milk at production level i.e. from cow to use new born calf only after 100% feeding of the calf, the remaining of milk was taken by the owner to his house for his family. Only after the fulfillment of milk needs in the family, the surplus milk was converted in version other products and sold in market. “Selling milk is like selling your grandson” is the thought in even 1980’s at northern states in India.

Later on this process was breached and the milkmen used to starve their family and sell the milk in market one step further, they started to starve the calf (young one of cow) for the milk of cow and use to sell the milk in market to oppose these improper deeds of the milkmen, lord Krishna started “Dahihandi” where he used to break the milk carrying earthen pots by not allowing them to sell in the market also, during the Pandava period Nakul and Sahadev, the youngest in them also expert in rearing of livestock.

In today’s scenario, where there is rise in industrialization and atomization has geared up resulting in need of fast life, fast food and fast money minting techniques this resulted in practice of adulteration of the milk for the more greedy and unhealthy practices.

The whole scenario in consideration with a simple life cycle wherein the fodder, crops, trees, etc. are eaten by the herbivorous animals and they are eaten by carnivorous animals and after these animals die, the non-living material is decayed and converted in manure which is then again consumed by the plants for their nutrition. This was a very simple followed lifecycle.

Under the civilization where the man used to settle at the banks of rivers where the crops for fodder and grains were cultivated in the land at that time the

grains were eaten by human beings and the fodder and residue were utilized by the livestock which in turn resulted in milk, available again for human beings.

As we know, milk contains fats, proteins, carbohydrates, vitamins and minerals that make it a complete food.

The dung of these livestock with the crop residue is converted in manure useful for crops as a very efficient effluent treatment of the fields.

Under the modern civilization & industrialization, people are running for more and more profits in the Industrial sector and not choosing the agro-dairy industry by the so called brainy people. Until 1960 the youth were interested to be a farmer rather than pursuing any other economic activity. Now the situation is reversed.

1.3 INDIA'S SOCIO ECONOMIC INDICATORS

In order to have some background on which the dairy activity is being focused as an economic activity. India's performance on socio economic front is as under:

Table 1.1: Indian's Performance on Socio-Economic front Selected Economic and Social Indicators

	2010-11	2011-12	2012-13	2013-14	2014-15
GVA at factor cost: (at current prices in Rs. crore)	72488603R	8832012NS	9252051NS	10477139NS	11550240AE
GVA at factor cost: (at constant prices in Rs. crore)	49185333R	8195546NS	8599224NS	9169787NS	9827089AE
Per capita Net National Income at factor cost at constant prices in `	362023R	64316NS	66344NS	69959NS	74104AE
Gross Domestic Capital Formation as percentage of GDP (at current market prices)	37	38.2	36.6	32.3	na
Gross domestic savings as percentage of GDP (at current market prices)	33.7	33.9	31.8	30.6	na
Index of agricultural production [base: Triennium ending 1981-82] for the data given till 2000-01 and base i.e. ending 2007-08 from 2009-10 onwards	121.0	125.2	124.2	129.6	123.9
Index of industrial production (Base: 2004-05=100)a	165.5	170.3	172.2	172.0	174.9

	2010-11	2011-12	2012-13	2013-14	2014-15
Wholesale Price Index average	143.3	156.1	167.6	177.6	181.2
Consumer Price Index for Industrial workers	180.0	195.0	215.0	236.0	251.0
(1) OUTPUT (a) Food grains [million tonnes]	(5) 244.5	(6) 259.3	(7)257.1	(8)265.0	(9) 252.68
(b) Coal and lignite [million tonnes]	570.4	582.3	602.9	610.0	459.4f
(c) Crude oil [million tonnes]	37.7	38.1	37.9	37.8	28.2f
(d) Electricity generated [utilities only] [billion KWH]	845.0	923.0	964.5	1014.8	741.4f
Plan outlay (Rs. crore) FOREIGN TRADE (i) Exports (Rs. Crore)	826268 1136964	936292 1465959	971951 1634318	1281022 (RE) 1905011	484533 (BE)g 1897026h
(US $ million)	251136	305964	300401	314405	310533.9h
(ii) Imports (Rs. Crore)	1683467	2345463	2669162	2715434	2734049h
(US $ million)	369769	489319	490737	450200	447548.3h
Foreign exchange reserves [excluding gold, SDRs and Reverse Tranche Position at IMF]; (` Crore)	1224883	1330511	1412631	1660914	1985458
(US $ million) SOCIAL INDICATORS Population (Million) i	274330 1186.0	260069 1202.0	259726 1235.0	276359 1251.0	317323 1267.0
Birth Rate (per 1000) j	21.8	21.6b	21.4m	na	na
Death Rate (per 1000)j	7.1	7.0b	7.0m	na	na
Life Expectancy at Birth (in Years)k	66.1b	na	67.5m	na	na
(a) Male	64.6b	na	65.8m	na	na
(b) Female	67.6b	na	69.3m	na	na
Education: Literacy Rate (%) l	74.04	na	na	na	na
(a) Male	82.14	na	na	na	na
(b) Female	65.46	na	na	na	na

Source : Pocket Book of Agriculture Statistics 2015, Govt. of India, Ministry of Agriculture and Farmers Welfare

Source: Ministry of Finance, CSO and RBI. BE: Budget Estimate, RE: Revised Estimate, AE: Advance Estimate na: Not available, NS: New Series Estimates a: GVA at factor cost estimates prior to 2011-12 are based on 2004-05 series.

1.4 INDIAN DEMOGRAPHIC SCENARIO

India is the second largest country next to China. The population growth rate has been brought down by pursuing a deliberate family planning policy. The data in the following paragraph shows how the population growth has been arrested. The Indian population size offers a vast potential market for the food grains, milk and milk products, and for all other consumable and consumer durable goods. In fact the growing population creates a tumbling block in the growth of the country.

In the year 1951 the total Indian population was 36,10,88090 of which the rural population was 29,86,44,381 and the urban population was 6,24,43,709. Thus in the percentage terms the rural population was 82.70 per cent and the urban population was just 17.3 per cent. According to the 2011 Indian population census India's total population stood at 1210193422 and its rural, urban break up was 833087662 and 377105760 respectively. In terms of percentage it works out to 68.83 per cent and 31.17 per cent respectively. The fall in the rural population over these years is mainly because of the migration of rural population to the urban locations for earning their livelihood, education and better civic facilities.

From this study point of view also, it will be worthwhile to understand the gender wise break of the Indian population which has been presented in the following table. This is mainly because in the rural area the raising of the livestock is attended to by the female members of the house. The following table gives the data as per the latest Indian population census of 2011. The table gives the data for Nation as a whole, for the state of Maharashtra and for the Pune district which is the carved out study area of this research.

Table 1.2 : Sex ratio and share of female population as per 2011 Census

Territory	Sex Ratio	Female population	Percentage of female population
India	940	586649174	48
Maharashtra State	925	54111575	48
Pune District	927	2717131	47.34

Source: National Census Data 2011

The literacy rate of the population is also significantly important from the point of the developmental efforts. This literacy rate is having gender wise differentiation. In the year 1951 the total literacy rate of the Indian population was 18.33 per cent of which male literacy rate was 27.16 per cent while female literacy rate was just 8.86 per cent. Due to the developmental efforts on the educational front, the literacy rate according to the 2011 population census, the total literacy rate rose to 74.4 per cent while of that of male literacy rate was 81.14 per cent and that of female literacy rate was 65.46 per cent. It clearly indicates that the government had paid due attention to the women's education and that the gap between the literacy rate of male and female has been considerably bridged.[1]

The data on this literacy front reveals that there is a consistent growth in the literacy rate of both the genders. As the literacy rate grows naturally the approach towards lifestyle, and work culture also positively changes. With regard to the present topic under research, the literacy of the female segment of population is quite encouraging as in the normal course the maintenance of the livestock is usually looked after by the female members in the family. If this literate force is imparted some basic training in the maintenance of the livestock it will definitely produce good result.

This research is focused on the rural area where the dairy activity is predominantly carried out. Here it will be appropriate to understand what is meant by a village. According to the Indian census 2011 the definition of the village is where the population is less than 5000. It has one more dimension of density of population. In this regard the criteria was where the population is less than 400 per sq.k.m. and where the 25 per cent of the male members are engaged in agricultural activity. Rural area, in general, is a country side located in the interior parts and outside the towns and cities. In other way it can also be stated as rural area is one which is not considered as urban area. The typical features of rural include low population density

[1] Office of the Registrar General Census of India 2011, Provisional Population totals, Paper 1 of 2011, India Series I.

and small settlements; predominantly agriculture is the economic activity. According to the Indian population census of 2011 there are over 6 lakhs villages in India.[2]

1.5 SPECIFIC FEATURES OF THE RURAL AREA

Following are the specific features of the Indian rural area:

1. **Size of the area:** As compared to the urban communities the villages are smaller in area, and the density of pollution is also less as it comprises of the villages.
2. **Density of population:** As the population density is less in the villages almost everyone knows each other in the village and in the vicinity.
3. **Agriculture is the principal economic activity:** The principal economic activity is agriculture. Majority of the residents own their agricultural lands and there is one more class which is referred to as agricultural labourers. The agriculture labourers do not have their own lands but they earn their livelihood by earning wages from the labour on the agricultural fields.
4. **Living in the natural environment:** In the rural area the residents are in close contact with the nature. There is no air pollution. Their rural routine revolves with the natural environment. They regard their agricultural land as their mother as it provides food, shelter and clothing not only for them but the surplus generated is marketed.
5. **Homogeneity:** Usually majority of the houses are connected. Their lands are but naturally connected. Their occupations are also the same. Because of the thickness of relationship with each other, they also work on each other's lands. In most of the villages the relations are quite harmonious irrespective of the religion, caste, class to which they belong to.
6. **Social stratification:** The rural society is divided amongst various castes which are traditionally based on their occupations.

[2]https://en.wikipedia.org/wiki/Rural_area

7. **Social Interaction:** As compared to the urban areas the rural areas witness lower social interaction. In the primary groups the interaction is quite intimate.
8. **Social Mobility:** Social mobility in the rural are relatively less mainly because the society is divided based on the castes which are based on their occupation. The caste hierarchy is predominant. Switching over to a new occupation outside the caste is very difficult.
9. **Social unity:** As compared to the urban and metropolitan areas the social unity is very thick. For any function, even the society comes together and helps each other.
10. **Joint family:** It is a peculiar feature of the rural families. The land ownership is vested in the name of the Karta (head) of the family. The lands are usually not divided until the death of the head of the family. The lands are jointly cultivated. Generally the head of the family enforces discipline and control the family.

The rural –urban differential in decadal growth population is also having a bearing on the developmental approach. In the year 1951-61 the rural growth rate was 2.06% while the urban growth rate was 2.64 per cent. In the decadal year 2001-2011 this rate was 1.22 and 3.18 respectively. This is mainly because of the migration from rural to urban locations. India is an agrarian country where over 78 per cent of population is dependent for their livelihood on the agriculture. Indian agriculture being dependent on the vagaries of the monsoon this sector does not provide employment throughout the year. Therefore, the rural population has to seek jobs in the urban centers. Availability of the healthcare facilities is also an area which influences the migration.

1.6 INDIAN AGRICULTURE SECTOR

India is a vast country which has been endowed with lots of natural resources including the land. There are three different seasons in agriculture: Rabi, Kharif and Perennial. In the following tables the researcher has presented the data relating to land utilization in India at the national level for the period 2000-01 to 2012-13.

Table 1.3 : Pattern hf Land Utilization (Thousand Hectares)

Year	Geographical Area	Forests	Not available for cultivation			Other uncultivated land excluding fallow land			
			Area under non-agricultural uses	Barren and unculturable land	Total (col.5+6)	Permanent pastures & other grazing lands	Land under Misc. tree crops & groves (not incl. in net area sown)	Culturable waste land	Total (col.8 to 10)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2000-01	328726	69843	23752	17483	41235	10662	3445	13631	27737
2001-02	328726	69720	23914	17414	41328	10528	3442	13520	27489
2002-03#	328726	69821	24119	17517	41636	10450	3431	13651	27532
2003-04	328726	69968	24516	17466	41982	10484	3381	13241	27106
2004-05	328726	69960	24761	17468	42229	10452	3362	13272	27086
2005-06	328726	69994	24993	17331	42323	10444	3391	13225	27060
2006-07	328726	70025	25445	17287	42732	10418	3351	13274	27042
2007-08	328726	69965	25882	17020	42902	10362	3400	13044	26806
2008-09(p)	328726	69978	26211	16851	43062	10344	3343	12735	26423
2009-10 (p)@	328726	69990	26157	17177	43334	10340	3214	12945	26499
2010-11(p)	328726	70028	26399	17175	43574	10305	3204	12646	26155
2011-12(p)	328726	70035	26309	17217	43526	10311	3167	12639	26117
2012-13(p)	328726	70007	26454	17284	43738	10240	3157	12578	25976

(p) : Provisional except Geographical Area.

@ : In 2009-10 there is significant decline in Total Cropped Area and Net Area Sown due to decline in net area sown in the States of Andhra Pradesh, Bihar, Jharkhand, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. This was mainly due to deficient rainfall.

Table 1.3 - Pattern of Land Utilization (Thousand Hectares) … continued

Fallow Lands			Net area Sown	Total cropped area	Area sown more than once (col.16 -15)	Agricultural Land/ Cultivable land/ Cultivable land/Arable land (col.9+10+14 +15)	Cultivated land (col.13+15)	Cropping Intensity (% of col.16 over col.15)
Fallow lands other than current fallows	Current fallows	Total (Col.1 2+13)						
11	12	13	14	15	16	17	18	19
10267	14777	25044	141336	185340	44005	183455	156113	131
10513	15343	25856	140734	188014	47280	183552	156077	134
11966	22459	34426	131943	173889	41947	183450	154402	132
11313	14489	25802	140708	189661	48953	183132	155198	135
10878	14792	25670	140642	191103	50461	182946	155434	136
10696	14213	24908	141162	192737	51575	182686	155375	137
10516	15512	26028	139823	192381	52558	182476	155334	138
10333	14646	24979	141016	195223	54207	182438	155662	138
10290	14192	24482	141899	195328	53429	182459	156091	138
10838	16009	26847	139173	189002	49829	182179	155182	136
10323	14275	24598	141563	197563	56000	182012	155839	140
10664	14515	25179	140974	195632	54658	181959	155488	139
11001	15282	26283	139932	194399	54467	181950	155214	139

(p) : Provisional except Geographical Area.

: In 2002-03 there is significant decline in Total Cropped Area and Net Area Sown due to decline in net area sown in the States of Andhra Pradesh, Karnataka, Kerala, Madhya Pradesh Maharashtra, Orissa, Rajasthan, Tamil Nadu, West Bengal and Haryana. This was mainly due to deficient rainfall.

@ : In 2009-10 there is significant decline in Total Cropped Area and Net Area Sown due to decline in net area sown in the States of Andhra Pradesh, Bihar, Jharkhand, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. This was mainly due to deficient rainfall.

1.7 GROWTH OF THE INDIAN AGRICULTURE

Right from the India's independence the Govt. of India has focused its attention to develop the agriculture section as it is making highest contribution to the India's Gross Domestic Product. The following table brings out the growth of the Indian agriculture sector.

Table 1.4: Growth of the Indian Agriculture sector ('000 hectares)

Classification	1950-51	1990-91	2000-01	2009-10	2010-11	2013-14
Total agricultural land	328.73	328.73	328.73	328.73	328.73	328.73
Total area under cultivation	284.32	304.86	305.19	305.83	305.90	313.67
Total area sown	131.89	185.74	185.34	188.99	198.87	207.65
Area under double cropping	13.15	42.74	44.00	49.81	57.39	57.42
Net irrigated area	20.85	48.02	55.20	61.94	63.60	66.03

Source: Director of Economics & Statistics, Ministry of Agriculture.

The data in table 1.4 reveals that there is a good growth in all the parameters. Particularly the area under double cropping and net irrigated area has shown considerable increase which has its impact on the total agricultural output.

It will be appropriate to have a broad view the Govt.'s Five Year Plans since the 7th F.Y.P.

Table 1.5 : Five-Year Plan expenditure /outlay on animal husbandry and dairying between 1980-85 onwards

Plan	Expenditure (Rs. Millions)			Dairying	Agriculture as percentage of total plan	AH&D as percentage of Agriculture
	Total Plan	Agriculture and Allied Sectors	Animal Husbandry & Dairying (AH &D)			
7th Plan 1985-90	2,187,296	127,926	4,768	3,744	5.85	3.73
Annual Plan 1990-92	1,231,205	72,559	1,989	1,194	5.89	2.74
8th Plan 1992-97	4,341,000	224,672	11,235	8,181	5.18	5.00
9th Plan 1997-02	8,592,000	424,620	5,927	1,469	4.94	1.40
10th Plan 2002-07	15,256,390	589,330	17,077	2,858	3.86	2.90
11th Plan 2007-12	35,827,680	1,628,490	29,071	5,783	4.55	1.79
12th Plan (2012-17) (Outlay)	76,698,070	3,632,730	116,100	49,760	4.74	3.20

Source: R. P. Gupta's Dairy India, 7th Edition, pp. 145

It can be seen that there is a substantial increase in the outlay for agriculture since 9th F.Y.P. The allocation for Animal Husbandry & dairying is substantially increased during the 12th F.Y.P.

Table 1.6: : Composition of the land utilization in percentage terms as of 2013-14

	Utilization	Percentage %
1.	Area under forest	23
2.	Area under non agriculture	8
3.	Non cultivable	6
4.	All-time Gairane – Grazing grounds for cows	3
5.	Area under grazing.	1
6.	Miscellaneous crops not covered under cultivation area	4
7.	Follow land for	8
8.	Net area under cultivation	47

Source: R. P. Gupta's Dairy India, 7th Edition, pp. 146

The table 1.6 shows that 47 per cent of the land is under cultivation and 23 per cent of the land is covered by the forest.

1.8 MAJOR CROPS OF INDIA AND AREA THEREUNDER

Paddy, Jawari, Bajari, What, Pulses, Food grains, oil seeds, and Sugar cane are the principal crops that are cultivate in India. The following table gives the details of the area under each crop.

Table 1.7: Area under principal crops grown in India ('000 hectares)

Name of the crop	2009-10	2010-11	2011-12	2012-13	2013-14
Paddy	41918	42862	44006	42754	48426
Jawar	7787	7382	6245	5214	7138
Bajara	8904	9612	8777	7297	9090
Wheat	28457	29069	29865	30003	28763
Pulses	23282	26407	24462	23257	22688
Food grains	121334	125773	124755	120776	123160
Oil seeds	25959	27224	26308	26484	24697
Sugarcane	4175	4885	5038	4999	4702

Source: Central Statistical Office, Statistic & Project Implementation Program Ministry, Govt. of India, Page No. 223

1. It can be seen from the table no. 1.7 above that there is a very meager increase in the area under paddy (6.64%)
2. The area under wheat crop is 7.86 per cent and the area under oil seeds depicts ups and downs in the area under cultivation.
3. Even under the food grains the area under cultivation is marginally increased.
4. Because of the growth in the irrigation sector, the area under sugarcane has shown good growth of 6.51 per cent.

1.9 PER HECTARE PRODUCTION OF CROPS OF THE PRINCIPALCROPS

The following table gives the data of the principal crops grown of the per hectare crop production in kilogram.

Table: 1.8: Production of India's principal crops per hectare in kilograms.

Year	Paddy	Wheat	Sugarcane	Cotton	Pulses	Oilseeds
1990-91	1740	2281	65395	1634	578	771
2000-01	1901	2708	68577	1867	544	810
2010-11	2240	2938	68596	2212	689	1159
2011-12	2372	3140	70317	2285	694	1135
2012-13	2462	3119	66940	2350	786	1169
2013-14	2424	3075	69839	2432	764	1153

Source: RBI Handbook of statistics on the Indian Economy 2013-14 p. 75-76

In respect of all the principal crops there is a consistent growth throughout the period mentioned above. However, there can be no complacency as the productivity is very much less than the productivity in the developed counties. Therefore, the govt. of India is giving thrust on increasing the productivity by improving the quality of the seeds, cultivation of modern practices, use of fertilizers etc. and the outcome is positive.

India is a country where agriculture is predominant economic activity. 68.4 per cent of the Indian population resides in villages. Following are the few important features of the Indian agriculture sector:

1. **Dependence on Monsoon:** Indian agriculture production is dependent on the vagaries of the monsoon. Therefore, it is seen that India in one

part of India there is heavy monsoon whereas in the other part there are scanty rains. Therefore, India has some time either dry or weight drought like situation which totally disturbs the rural economy.

2. **Comparatively low crop yield:** Majority of the agriculturists follow traditional approach to cultivation. In major areas there is no dependable source of water. India being a developing country it is faced with low capital formation. This leads to low investment in agriculture which affects the crop yield adversely. As compared to the world over our crop yield is drastically low and there is need to step up the same.
3. **Low level of farm mechanization:** Because of the traditional type of cultivation and the small and fragmented land holding, use of farm mechanization is also on low level. Now the banks are extending finance for purchase of farm machinery and equipment and the position is now improving on this score.
4. **Disguised unemployment:** Indian agriculture is dependent on Rabbi, Kharif and perennial crop seasons. There is no full time engagement in agricultural activity and as a result there is prevalence of disguised unemployment. Agriculture does not provide full time employment throughout the year. After sowing and initial operations, the cultivator remains idle. According to the experts this idle period ranges between five to six months. In a way the cultivation has a seasonal employment.

The impact of low yield is on the cultivator's income generation. Not only that there is uncertainty of income because of the frequency of droughts, the seasonal unemployment nature also necessitates that the cultivators should carry out some economic activity which is complementary to the principal activity of agriculture. This is required to boost his dependable earnings to have stability. The economic activities which the agriculturist can take up are called as "Activity Allied to Agriculture" or Activities complementary to agriculture. These activities include:

1) Dairy 2) Poultry 3) Fishery 4) Piggery 5) Seri culture
6) Apiculture etc.

These activities can engage the agriculturists for gainful employment round the year and supplement his income generation. These activities are discussed in brief hereunder.

1.10 CONCEPTUAL FRAMEWORK

Management

The term management includes either individual or a group of individuals. Mainly the management encompasses planning, budgeting, directing, organizing, staffing, controlling, etc. The management tasks are to be attended by the individuals as by itself management does not work. The management is concerned with the attainment of the objectives set out by the organization. Management should be cost conscious and therefore it targets high degree of efficiency and productivity.

The term management has been defined by Henri Fayol who is regarded as the father of the management science as under:

> **Henri Fayol**, "To manage is to forecast and to plan, to organize, to command, to co-ordinate and to control."

> **Harold Koontz** another management Guru has defined the term management as "Management is the art of getting things done through and with people in formally organized groups."

Livestock

Livestock are domesticated animals raised in an agricultural setting which produce commodities such as food, fiber, and labor. However, in the normal course the term is exclusively referred to indicate those animals which are raised for food only such as cattle and goats[3]

[3] https://en.wikipedia.org/wiki/Livestock

Rural Economy

About 68.4 per cent of the Indian population resides in the rural area. The principal economic activity pursued by these villagers is agriculture and activity allied to agriculture. Agriculture activity is the backbone of the Indian economy. For quite some time this agriculture sector was dominating in the Indian economy. Even today the contribution of agriculture is sizable but the industrial sector has taken over its position over the years. The present government is very well seized with the issue of raising the agriculturist's income in a time bound manner. Therefore, it is likely that the agriculture sector may gain its original position in the composition of the Indian economy.

Over the past four decades, the government has heavily spent on the rural development which has transformed the rural structure.

The Government had addressed its efforts in land reforms, providing irrigation facilities, establishing veterinary services, promotion of village industries, improving village administration, development of local leadership to bring about these changes. The Government had launched several rural development programs for the benefit of the villagers. These efforts were directed to modernize the agricultural cultivation and improving the production. Over the past few years the use of high yielding varieties of crops as well as consumption of fertilizers and farm mechanization has substantially increased.

On the socio-economic front the government has introduced several welfare activities which include opening of schools, primary healthcare centres, improvement of infrastructure and communication in the rural areas. These schemes have certainly made positive impact on the rural life.[4]

Rural economics is the study of economics, including: economic growth, development, and change, size and spatial distribution of production and household

[4] https://www.linkedin.com/pulse/rural-economy-india-meaning-features-kuntal-sanghvi

units and interregional trade, land use, housing and non-housing as to supply and demand.[5]

Risk[6]

Likely hood of threat of damage, loss, or any other negative occurrence of any event is called risk. Risks are caused either by external or internal factors. By initiating appropriate preemptive action the risks can be totally avoided or minimized.

Finance

There are various types of risks in the Finance category. These risks are basic risk, capital risk, country risk, default risk, delivery risk, economic risk, exchange risk, liquidity risk, payment risk, political risk, and underwriting risk etc.

Management of Risk[7]

Risk management is the process of identifying, quantifying, and managing the risks that an organization faces. As the outcomes of business activities are uncertain, they are said to have some element of risk. These risks include strategic failures, operational failures, financial failures, market disruptions, environmental disasters, and regulatory violations. Risk is a statistical concept that is measured using statistical concepts that are related to the unknown future. Almost all investments are exposed to it.

Risk Management

The risk management is a skillful activity. The first and foremost requirement is to identify the specific risk area and its exposure. Find out various alternatives available to avoid the probable risk. When the risk is inevitable then the management should think of best possible alternative to minimize the risk. The risk management should also be concerned with the impact of the risk on the future earnings of the company.

[5] https://en.wikipedia.org/wiki/Rural_economics
[6] http://www.businessdictionary.com/definition/risk.html
[7] ibid

In fact profit is the reward for risks undertaken. Therefore, in a commercial organization it is not possible to remove all the risks. What is important is to take effective steps to eliminate the risk element by taking appropriate preventive measures. The management should always be on its toes to implement a strategy to minimize or eliminate the risks the organization is facing. For this purpose in an organization every responsible official has to play his role efficiently.

There are certain readymade safeguards to prevent the risks. E.g. the management can insure its assets against various types of risks such as fire, earthquake, loss of business etc. Similarly, by proper planning and using latest technology productivity and quality of the product can also be further improved to withstand the competition in the market.[8] The organization should ensure that there is proper coordination amongst the various departments so that duplication of efforts can be avoided.

According to the managements experts' management is the highest risk taking body in every organization. It is also considered as one of the factors of production. The principal task the management has to address to is marketing and research and development. The management takes policy decisions and the chief of the organization ensures that the policy decisions taken by the decision making body are executed in the right perspective to achieve the goals set out by the top management.

The directors and managers who have the power and responsibility to make decisions and oversee an enterprise form the management.

The size of management can range from one person in a small organization to hundreds or thousands of managers in multinational companies.

[8] http://lexicon.ft.com/Term?term=risk-management

1.11 CONTRIBUTION OF AGRICULTURE SECTOR TO INDIA'S GROSS DOMESTIC PRODUCT (GDP)

With advent of industrial revolution since 1956 the industrial sector has been consistently growing. While implementing the five year development plans agriculture was given special attention as India was then importing the food grains from the developed countries. However, over the years the government has been able to convert India into not only self-sufficient but also exporting the agricultural produce to number of countries. However, because of the industrial and services sector development, especially after the adoption of globalization, liberalization and privatization, the industrial sector has received boost up and gradually the share of agriculture and allied activities in the GDP has been declining. Today, the government is also seized with this problem and efforts are being made to step up the agriculture and improve its share in GDP. The diary sector is one of the major components of agriculture and allied sector contributes around 20 per cent of the value of output. Dairying is recognized as an effective tool for social and economic development. The following table depicts as to how the composition of India's GDP has fared during the last few years.

Table 1.9 : India's GDP growth rates during the period 2010-11 to 2014-2015

F. Y. Ending 31st March of

	2011	2012	2013	2014	2015
India's growth rate of GDP (2004-05 prices) (Factor Cost)	8.91	6.69	5.6*	6.6*	7.2*
Industrial growth GDP (2004-05 prices)	7.55	7.81	5.00*	5.9*	7.3*
Agriculture & Allied Sector (2004-05 prices)	6.60	5.02	1.5*	4.2*	-0.2*
Services Sector Growth	9.67	6.57	7.08*	10.3*	9.2*

Source: Reserve Bank of India, Central Statistical Organization, Finance Ministry CSO 30/05/2014

* At 2011-12 prices.

1.12 ACTIVITIES ALLIED TO AGRICULTURE

1) Dairy

Dairying in India has emerged as a very important activity with around 300 million dairy animals producing more than 146.3 million tonnes of milk per annum. Milk and milk products are highly perishable and therefore demands adequate quality and food safety. The role of the Indian Agriculture and allied sectors is of very importance in ensuring 'inclusive growth'. It is very essential to make the dairy farmers aware of the importance of the quality and the risks which should be addressed while carrying out the dairying activity.

Dairy in India is a unique activity in more than one respect. India ranks first in the world in having a large bovine population. So far as output is concerned, milk is the single largest agriculture commodity in the country. Dairy contributes nearly 33 per cent of the gross income of rural households in case of those who are having land and in case of those who do not have any land it accounts of 50 per cent.

Amongst the various food items milk is the top most single source that can ensure sound health, particularly for growing children and senior citizens. Milk is highly nutritious food and an excellent source of energy, protein, vitamins and minerals. India ranks the largest milk producer in the world with a total production of 146.3 million tonnes.

In the year 2014-15, India ranked first in the World so far as milk production is concerned accounting 18.5 per cent of the total world production. In the said year the Indian milk production was 146.3 million tons. In the year 2013-14 India's milk production was 137.69 million tons. [9] Details about livestock population in India have been presented in table 1.10.

[9]http://www.news18.com/news/business/economic-survey-2015-16-india-ranks-first-in-milk-production

Table 1.10 : Livestock Population in India position as on 31st March of 2016

(Million Numbers)

Year →	2011	2012	2013	2014	2015	2016
Cattle	**155.3**	**192.5**	**204.6**	**185.2**	**199.1**	**190.9**
Buffalo	**43.4**	**69.8**	**84.2**	**97.9**	**105.3**	**108.7**
Total Bovines	**198.7**	**262.4**	**289.0**	**283.1**	**304.4**	**300.0**
Sheep	39.1	48.8	50.8	61.5	71.6	65.1
Goats	47.2	95.3	115.3	124.4	140.5	135.2
Horses & Ponies	1.5	0.9	0.8	0.8	0.6	0.6
Camels	0.6	1.1	1.0	0.6	0.5	0.4
Pigs	4.4	10.1	12.8	13.5	11.1	10.3
Mules	0.1	0.1	0.2	0.2	0.1	0.2
Donkeys	1.3	1.0	1.0	0.7	0.4	0.3
Yaks	NC	0.1	0.1	0.1	0.1	0.1
Total Livestock	**292.8**	**419.6**	**470.9**	**485.0**	**529.7**	**512.1**
Poultry *	73.5	207.7	307.1	489.0	648.8	729.2
Dogs	NC	18.5	21.8	29.0	19.1	11.7
Rabbits	NC	NC	NC	0.5	0.4	0.6

Source: Department of Animal Husbandry, Dairying & Fisheries. NC: Not Collected

* includes chicken, ducks, turkey & other birds. $ Provisional derived from village level total.

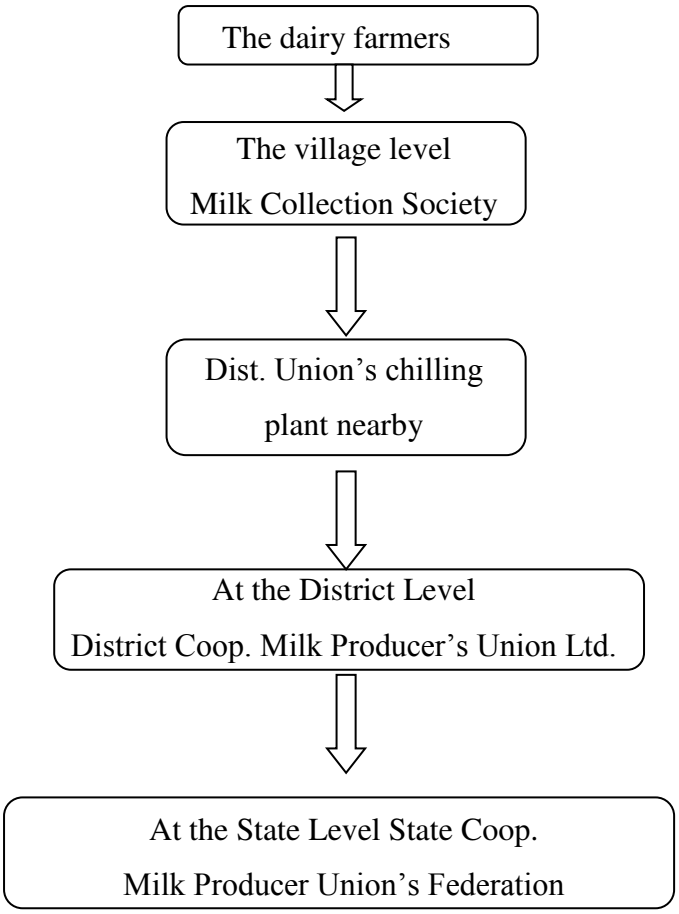
It can be seen from the table 1.10 above that the total bovines through the period covered by the above table shows consistent increase. It accounts for 58.5 per cent of the total livestock. Naturally the contribution of the dairy activity to the Indian economy is more. Therefore, this research study has focused on the dairy activity.

Table 1.11: All India Production of Milk in Million Tons

Year	1990-91	2000-01	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Milk	53.9	80.6	116.4	121.8	127.9	132.4	133.7	146.3

Source: Dept. of Animal Husbandry, Dairying & Fisheries, Source**:** Pocket Book of Agriculture Statistics 2015, Govt. of India, Ministry of Agriculture and Farmers Welfare

The major portion of the agriculturists who are predominant rural residents are engaged in the dairying activity as an activity to agriculture to supplement their agriculture income. These large numbers of agriculturists are traditionally carrying out the dairy activity. In India there is good demand for buffalo milk as well as cow milk. The dairy activity normally has the following chain:



Livestock

So far as milk is concerned broadly there are two types of milk are available. Those are: 1) buffalo milk 2) Cow milk. There are number of varieties in buffaloes:

1)	Local breed	2)	Mehsana breed
3)	Delhi Murrah	4)	Jafarabadi

Each of the variety has its peculiarities so far as yield is concerned, maintenance is concerned,

As regards cows, apart from the local breed there are two types of cross breed cows which are more popular in India. Those are 1) Jersey 2) Holstein. A comparative picture of per capita availability of milk in India and Maharashtra is presented in table 1.12

Table 1.12 : Per Capita Availability of Milk AT All India and Maharashtra State level (gms/day)

State	06-07	07-08	08 - 09	09-10	10-11	11-12	12-13	13-14	14-15	15-16
All India	251	260	266	273	281	290	299	307	322	337
Maharashtra	181	184	188	190	197	206	213	219	228	239

Source: Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, Government of India

It can be seen from the above data that the per capital availability of milk at the national as well as Maharashtra state level is showing an increasing trend. The statistics also reveals that there is still scope for Maharashtra so far per capita milk availability is concerned. It means there is still untapped potential for dairy activity.

At the district union level the milk collected is further processed in different forms as per the demand from the market and sold it through its retail outlets to the direct consumers. This is how the whole process gets completed.

With this brief background of the dairy mechanism a sincere effort has been taken to discuss the organization from the grass root level stage i.e. village level. At the village level the dairy farmer procures the livestock per his choice and maintains it. He then supplies the milk to the local dairy society regularly of which he is a member. If he is not a dairy member, he has a choice to sell the milk to any of the customers of his choice. Now with this back drop the probable risks which are required to be taken into account and plan to overcome those risks are discussed in detail.

1.13 RISK MANAGEMENT IN DAIRY

Dairy is an economic activity. Any economic activity is carried out to earn profit. According to the economic theory, profit is the reward for risks undertaken. Therefore, dairy activity is also susceptible for risk. Risk is unavoidable in any

business and dairy is not an exception to it. Risk is characterized by uncertainty of outcomes.

Risk in agriculture is all-encompassing and complex. Indian agriculture is mostly dependent on the availability of regular monsoon. It is necessary that it is timely and in adequate quantity. This is very rarely achieved. During the last decade Indian agriculture has witnessed irregularity in rain fall, untimely rains, and drought situations. Thus, the management of the risk on this rainfall conditions is very complex activity. India is a vast country and the climatic conditions also differ from region to region. Therefore, the origin of risks and its severity differs from situation to situation.

Management means a decision making activity and choosing a right alternative to achieve the desired objective. This is achieved through various aspects of management, broadly planning, budgeting, staffing, directing, communicating, reviewing, etc. Therefore, the risk management envisages understanding the potential risk in any activity and thinks of various alternatives available, formulate a strategy identifying a right strategy, to overcome the risks involved. What is important is the assessment of risk in advance and developing solutions to overcome the same.

Integrated Risk Management is an approach in which instead of preparing a strategy for a particular risk in isolation (individually) all the stakeholders who are involved in running the activity come together and address the risk factor from a variety of angles and arrive at a solution to manage it. The risks are varied in nature. It may pertain to the policy, availability of raw material, availability of backward and forward linkages, natural calamities, etc.

In the following few paragraphs the researcher has discussed various stages where risks are involved in the dairy activity and the care required to be taken by the various stakeholders as have been pointed out earlier.

1. Individual Dairy Farmer

Risks involved

In today's circumstances it has become necessary that before undertaking the dairy activity the dairy farmer should understand the economics of the dairy activity. It has been observed that the dairy farmers are not maintaining books of accounts therefore, they are not aware whether their dairy unit is running in profit or otherwise. Of late, it has been observed that the prices of the cattle feed, green and dry fodder have gone high making the dairy unit marginally viable. The economics of the dairy activity as of today is as under:

a) At the time of purchasing the cattle

Care needs to be taken to select freshly calved cattle/buffaloes of 2nd and 3rd lactation from farmers after assessing their production performance for 3 milking with the idea that these cattle/buffaloes would be serving as future bull mothers. These should be purchased with 15 days of calving so that their peak yield is not missed.

Management of Health Care & Breeding

In India in the rural area there is a gross unawareness amongst the dairy farmers about the technical skills required to have proper breeding practice. In fact it is expected of the dairy farmer to maintain proper records and progeny testing which is essential to improve the herd quality. For this purpose the need of the hour is to expand the network of the Artificial Insemination centres and their extension services. The government may also seek the assistance of research institutions and private sector participation. In order to have disease free and superior quality of the calf germ plasma needs to be focused to address this issue. The dairy farmer should have basic knowledge for preventing the common diseases that occur frequently and they should be educated to take preventive measures so that the milk production will not hamper.

b) Housing arrangement for the livestock

The important source of contamination is the animal shed. It should have proper drainage, adequate lighting and ventilation. The surface should be dry in the animal shed. The milking area needs special care to ensure hygienic conditions. The drinking water to be given to the cattle should be potable. The udders should be clean,

flanks of the animals as well as the utensils where the milk is being collected and the milker's hands should also be clean to prevent any contamination.

c) Health Care and raring of the livestock

Health Care

Whenever there is a diseased animal, its milk should not be mixed with the other milk. It should be kept separately and that its disposal should be attended on top priority. If there is any animal which has a contagious disease, care should be taken to a segregated from the healthy cattle. Cattle should be regularly washed and cleaned. The udders should be washed before every milking and cleaned and dried using a cotton cloth after milking.

d) Milking the cattle

Now a day, milking machines are used on a large scale, wherein the danger of contamination is relatively very less. Care should be taken to see that the milker does not have any contagious diseases. The milker should trim his nails. The milker should wear clean clothes and wash his hands before milking and after milking using soap. The milking area should be cleaned after every milking activity.

e) Storage and Transport, Supplying the milk to the dairy / ultimate consumer

Greater care is required to be taken while storing the milk. Before it is stored, the cleanliness of the container needs to be ensured. According to the present legal provisions the container should be of stainless steel material. The milk should be filtered before it is stored so as to ensure that any particles that might have entered in the milk are kept out. The container should have a proper lid and it should be stored in a cool place. Before each milking the containers should be cleaned and sanitized. The storage place should be free from flies, insects, dust, dirt, etc.

f) Care of the calf

The dairy farmer has to ensure timely vaccination, deworming, management of feeding schedule with ration balancing.

Sucking method

There are various methods and in every method there are advantages and disadvantages. Due to space constraints only one method which is more popular is detailed hereunder with its advantages and disadvantages.

In this method, the calf is allowed to stay with its mother and allowed to suckle only a little before and after of milking the cow. The calf gets whole milk throughout lactation.

Advantages

i) This is a natural system of feeding.
ii) The calf gets contamination free milk.
iii) No much care is required to take during feeding.
iv) The mother-calf affection developed.

Disadvantages

i) If calf dies, the cow refuses to let the milk.
ii) It cannot be ascertained about over feed or under feeding of the calf.
iii) If milk is infected the infection may be transferred to calf.
iv) The actual quantity and quality of milk yield of cow cannot be calculated.
v) The post-partum heat is late.

Village level dairy societies

a) Proper collection arrangements
b) Proper storage arrangements
c) Transporting the milk to the headquarter of the Dudh Sangh
d) Maintenance of proper records
e) Proper payment system for the milk proceeds.
f) Ensuring proper education and training to the dairy farmers
g) Providing guidance to the dairy farmers.

g) At the District Milk Producers Coop. Union's Main Processing Plant

At the dairy processing plant of the district milk producer's main processing plant, at every stage i.e. while receiving the milk as well as while feeding it to the processing plant it should be filtered again and then it should be taken to processing. At every stage of processing the technician should take abundant care in handling the milk till it is packed for marketing. Cleanliness should be the buzz word in the dairy plant. The plant should be properly cleaned and serviced as per the prescribed procedure by the plant supplier.

h) Economics of Dairy Activity

1) For the individual dairy farmers (Viability norms for the individual)

The district cooperative milk Sangh Ltd. Katraj Dugdhalay, Katraj Pune has worked out the economics of a single cow's per day income and costs as under:

Per day average milk production	12 litters
Per day income @ Rs.21.50 per litter (Assumed fat 3.5, S.N.F.8.5)	Rs. 258
Income from cow dung	Rs. 40
Total income	**Rs.298**

Per day expenditure of a cow

Presumption that every input is purchased from outside

Sr. No.	**Particulars of expenditure**	**Rs.**
1	4 Kgs. Of cattle feed @ 21/- (Godrej Milk plus)	84
2	Green fodder 25 Kgs. @ Rs.4/-	100
3	Dry fodder 5 Kgs. @ Rs.6/-	30
4	Medical expenses	20
5	Mineral Mixture	8
6	Light bill	8
	Total	**244**

Total income	Rs. 298.00
Total Costs	Rs. 244.00
Daily profit per cow	**Rs. 54.00**
Per litter profit	Rs. 4.50

However, if the activity is being pursued as an activity allied to agriculture usually the dairy farmer has the green fodder and the dry fodder from his agriculture land. Therefore, the profit per litter also increases.

If the Dairy farmer is having more than 5 cows he can certainly go in for a biogas plant which not only gives him gas plus high quality of organic fertilizer.

2) For the village level Milk Producer's Society

Minimum member's criteria: 51

Daily average collection of milk: 50

Space requirement: 500 sq. ft.

3) Economics of Gobar Gas Plant

If the dairy activity is enlarged to minimum of 5 cows or buffaloes one can comfortably go in for gobar gas plant installation. It enhances the profitability of the dairy activity by getting gas and high quality fertilizer.

For 5 members' family:

The size of the gobar gas plant should be 2 Cubic Meter

Daily dung availability from she-buffaloes : 15 Kg.

Daily dung availability from bullock and cows: 10 kg.

Daily dung availability from the calf: 5 kg.

From 1 Kg. of dung 37 ltrs. Gas is produced.

For cooking per person per day0.227 Cubic Meter Gas is required

For lighting: 0/127 Cubic Meter gas is required

2) Poultry

The poultry activity is mainly of two types – 1) layers poultry where the chicks are raised for egg purposes and the eggs are sold 2) broilers poultry where in the chicks are raised for direct consumption. Both these activities are pursued in the rural areas as it provides self-employment and a steady income. However, for the management of the poultry farm requires proper training to the management otherwise it is exposed to greater risk.

Keeping in view the importance of the poultry activity the government has initiated several steps to enhance the commercial poultry production. It has focused its attention in strengthening the family poultry system. This thrust enables the generation of employment as well as helps in sorting out the livelihood issues.

Over the past few years the egg and poultry meat production in India has registered a good growth. So far as egg production is concerned in the financial year 2014-15 India's total egg production was around 78.48 billion eggs and the poultry meat production was about 3.04 Million Tones.

3) Apiculture

This is an activity wherein bees are raised for extracting honey and market it. This is also an activity allied to agriculture. This activity is being carried out on a large scale in Satara district of Maharashtra.

4) Sericulture

Sericulture is one of the oldest industries in India. The silk is the final product of this industry. It particularly suits to rural population working with agriculture. This sericulture activity relatively requires low capital investment and the returns are quite attractive. Even the small and marginal farmers can also pursue this activity.

Maharashtra is a nontraditional sericulture state producing Mulberry and Tasar silk. The specialty of the state is that, it undertakes 98% of bivoltine sericulture and stood first among nontraditional states and one of the potential States in India for silk production.

5) Pisci culture (Fishery)

The contribution of the fisheries to Indian GDP is 1% while its percentage shares in the total agriculture segment it works out to 5.08 per cent. During the financial year 2014-15 the total production of fish was 10.16 million tons. During the F.Y. 2016-17 the production showed an increasing trend. The government is trying to diversify farm and non-farm activities in the agriculture to ensure livelihood security.

1.14 WORLD DAIRY SCENARIO

"As incomes increase, demand for greater food variety grows. Demand for higher -value and quality foods such as meat, eggs and milk rises, compared with food of plant origin such as cereals. These changes in consumption, together with sizeable population growth, have led to large increases in the total demand for animal products in many developing countries, and this trend will continue". – Quote from an outlook report from the United Nations Food and Agriculture Organization (FAO 2003),[10]

1.15 INDIAN DAIRY SCENE[11]

Operation Flood & White Revolution (1970-1996)

Immediately after the independence 43 per cent of the demand for milk was met through milk powder and butter oil through imports. The milk supply in the urban and metropolitan areas was met through the milk supply received from the nearby villages and dairy farms installed by the private entrepreneurs. In the rural area the milk supply was met through raring one or two dairy cattle. The dairy activity or other milk products activity was not looked from the commercial angle. After two decades from the independence the demand for the milk started increasing rapidly. The demand from the urban as well as rural area continued to increase. This led to adulteration in the milk and the supply in the urban area was at price.

By this time, Dr. Verges Kurien, Graduate from the Milk Engineering College entered Anand Govt. Milk processing organization. In order to supply milk to Mumbai a district dairy society was established in 1946 at Kaira. However, the

[10] https://www.ifama.org/resources/Documents/v19ib/2Vitaliano.pdf
[11] Economic Survey 2015-16 presented to the Parliament by the Finance Ministry

society was finding it difficult to compete with Polson Company a private organization. Dr. Kurien decided to leave the Govt. job and started assisting Anand Milk Union and Kara Dist. Milk Producers Union. In the year 1962 the said Kaira district dairy Union had 210 cooperative dairy societies having membership of 46000 and it turned out to be the number one cooperative milk producers society in India.

In order to have reasonable rates for the milk producer and to have adulteration free milk supply all over India, the then Prime Minister Mr. Lalbahadur Shastri, established National Dairy Development Board in 1965 and Dr. Kurian with 96,000 dairy societies spread over in 75,000 villages having over 90 lakh memberships. It was comprised of 180 District Milk unions and 30 State Level Apex Institution. During this 30 years period, India which was importing the milk powder and bunter oil became the self-reliant in milk production and not only that it started exporting the milk and milk products. Today, India is number one milk producer in the world. Dr. Verges Kurien strengthened the dairy societies. Operation flood – scheme was closed in 1996. In 2012 the number of milk societies were 1,13,152 and the membership of these societies of the order of 13 million and the milk production reached to 122 million tones. The overall milk market value is over 2,50,000 crores and it is much more than any other agricultural crop. [12]

In India in the year 1990-91 the per capita availability of milk was just 176 grams per day. After the implementation of the White Revolution there is a phenomenal growth in the availability of milk to the extent of 322 grams per day in the year 2014-15. There is a continuous increase in this regard. Over the years, the dairy activity has proved to be an important activity to supplement the agriculturist's income in the rural areas.

Now the dairy sector has adopted integrated approach to this activity. It starts from maintaining livestock, collection of milk in the primary milk producers' cooperative societies, its transportation to the processing plant, processing of the milk collected for different purposes and then again to transport the processed milk to the respective markets. This is being successfully handled at each level. This

[12] Dr. Ramanath Sadekar, Architect of Autobiography, Agriculture Volume pp 250-252

supplementary income from the dairy activity helps the dairy farmers to meet their cash requirement for day to day life. On the back drop of the seasonal crop incomes this dairy activity has proved to be very much useful in the rural areas.

According to the data available from the Central Statistical Office, the growth in the agriculture and allied sectors is estimated to be 11 per cent in 2015-16. The Twelfth Five Year Plan (2012-13 to 2016-17) had envisaged a growth rate of 4 per cent for the agriculture and allied sectors. The realized growth rate during the last three years has been fluctuating at 1.5 per cent in 2012-13; 4.2 per cent in 2013-14; and (-) 0.2 per cent in 2014-15. The decline in the growth rate has been attributed to the continued drought in 2013-14 and 2014-15. India's estimated milk production in 2015-16 was 155.49 million tons, which is about 6.28 per cent higher than last year. The estimated per capita availability in 2015-16 was 337 grams per day, an increase of 4.7 per cent over the previous year.

The collective contribution of the cooperative sector was 15.58 million tons of milk which was 12 per cent higher than the last year. Imports of milk and milk products increased marginally while the exports declined from 35,800 tons during 2014-15 to 12000 during the period 2015-16, which accounts for 30 per cent.

According to one report private companies have reduced the procurement volume and prices of liquid milk, thereby affecting farmers' income and viability of smallholder dairy farms. The private dairy farms have also scaled down their operations to contain the losses.

Women producers form the major workforce of the dairy sector. Efforts are continued to strengthen and empower them. There are 5.01 million women members in dairy cooperatives.

The milk production in India is growing at a faster rate of 6 per cent. The market for value added dairy products is growing high at 21 to 31 per cent. Growth is a value added products market is a positive sign and is an important tool for paying higher returns to the farmers. As per Food & Agriculture Organization, out of 76

million households involved in milk production, share of commercial dairy farming is merely 5 per cent of milk production produced by 1 of dairy animals and only about 7 per cent of estimated 105 lakh hectares of fodder grown in India.[13]

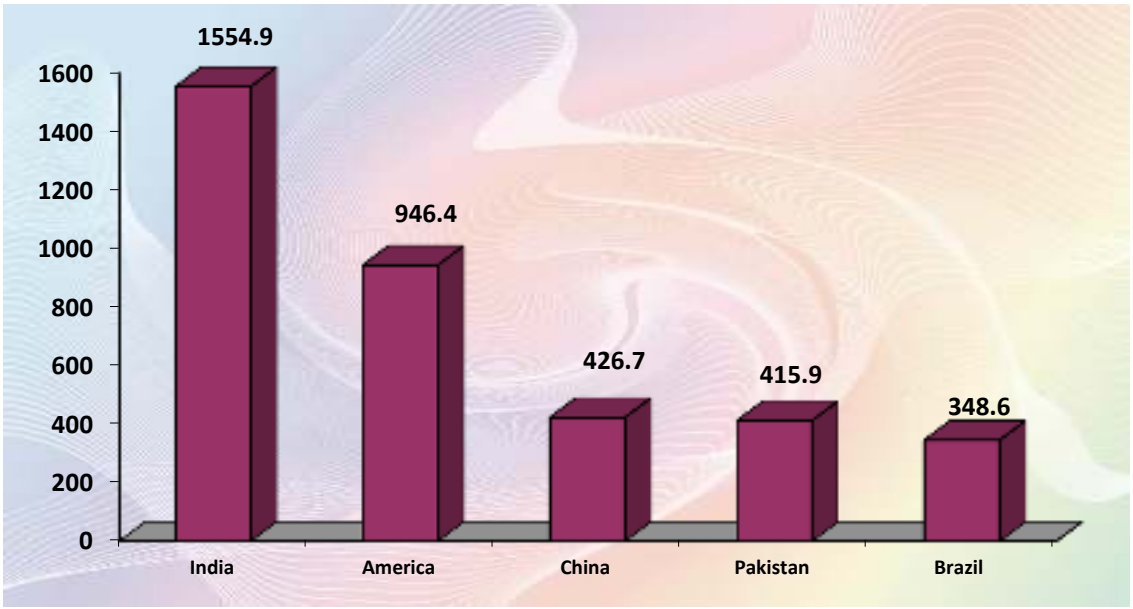
India is topping the list of milk production in the world. The following data will through light on it.

Table 1. 13: Top Six milk producing countries in the world. (as on 31.3.2017)

Name of the country	India	America	China	Pakistan	Brazil	Germany
Milk production in Lakh Tons	1554.9	946.4	426.7	415.9	348.6	327.1

Source: FOASTAT, 1st March 2018

Fig. 1.1: Top Six milk producing countries in the world (lakh tons)



Source: Food and Agriculture Organization Corporate Statistical Database FOASTAT,1st March 2018

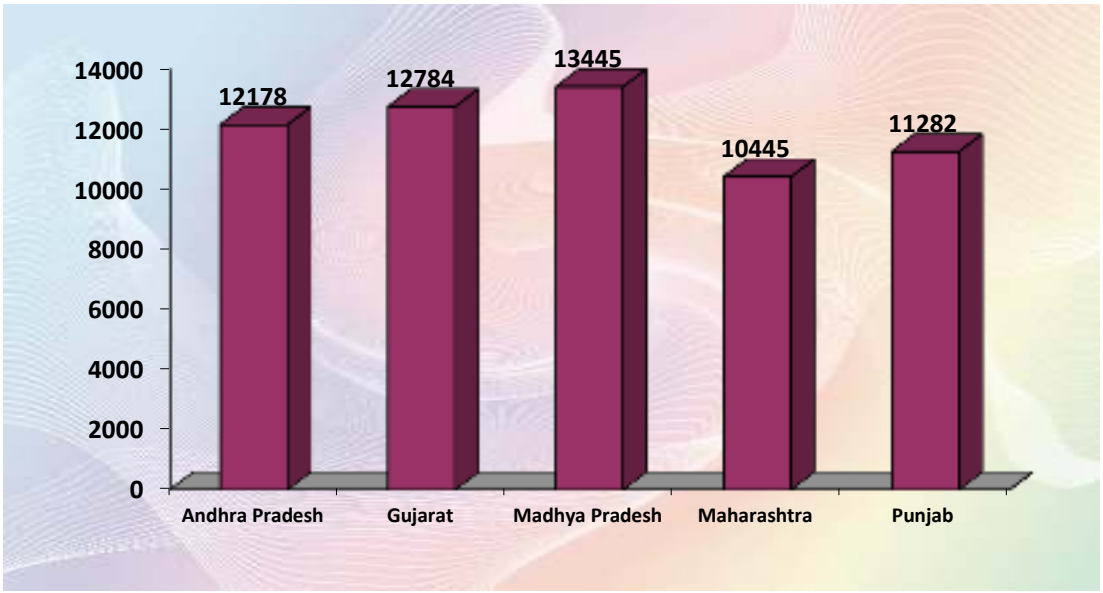
The majority of the countries either import milk or use skimmed milk powder to meet their demand. So far as per capita per year, milk consumption is concerned as on 31st March 2017 Finland was topping the list with 369.19 kg., while Indian consumption is 125.5 kg.

[13] Central govt. letter regarding Animal Hostel Model, bearing No. DO.No.22-18/2016-DP dated 14.10.2016

Table 1.14: Major milk production states with their production and availability of milk per capita per day:

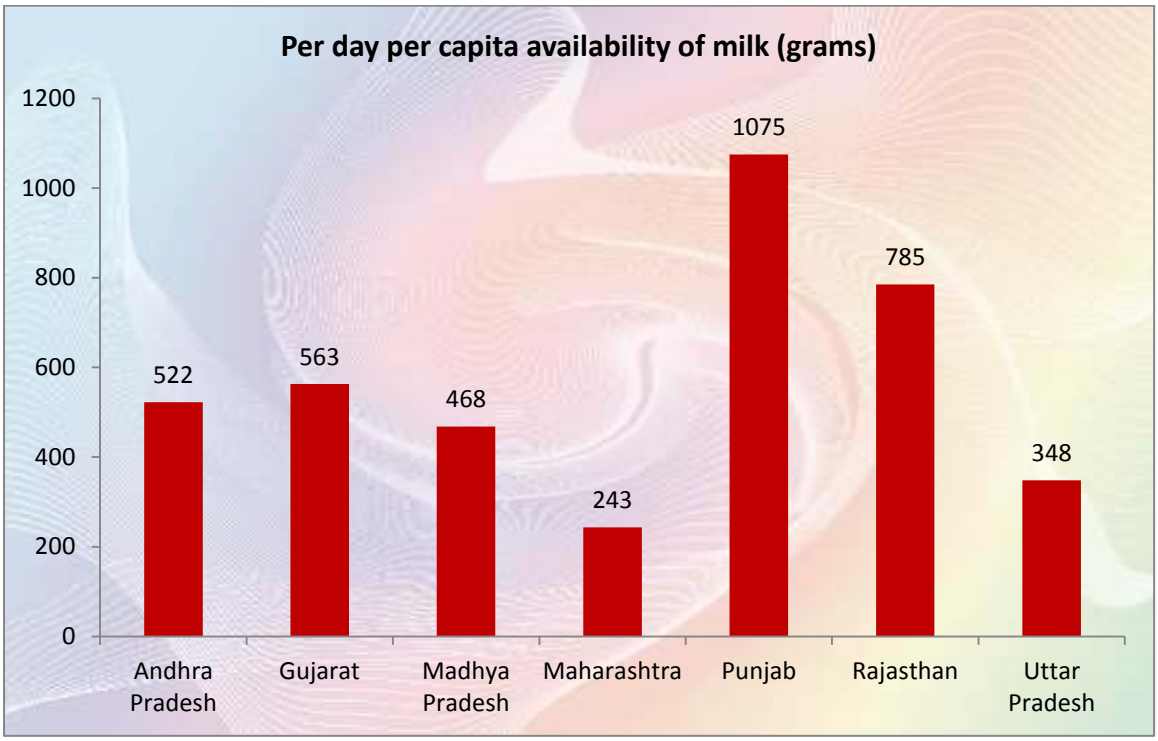
Name of the State	Andhra Pradesh	Gujarat	Madhya Pradesh	Maharashtra	Punjab	Rajasthan	Uttar Pradesh
Milk production tons ('000 omitted)	12178	12784	13445	10445	11282	20850	27770
Per day per capita availability of milk (grams)	522	563	468	243	1075	785	348

Fig. 1.2 :Major milk production states with their production per day as of 31.32017



This shows that there is plenty of scope for the state of Maharashtra to step up its milk production.

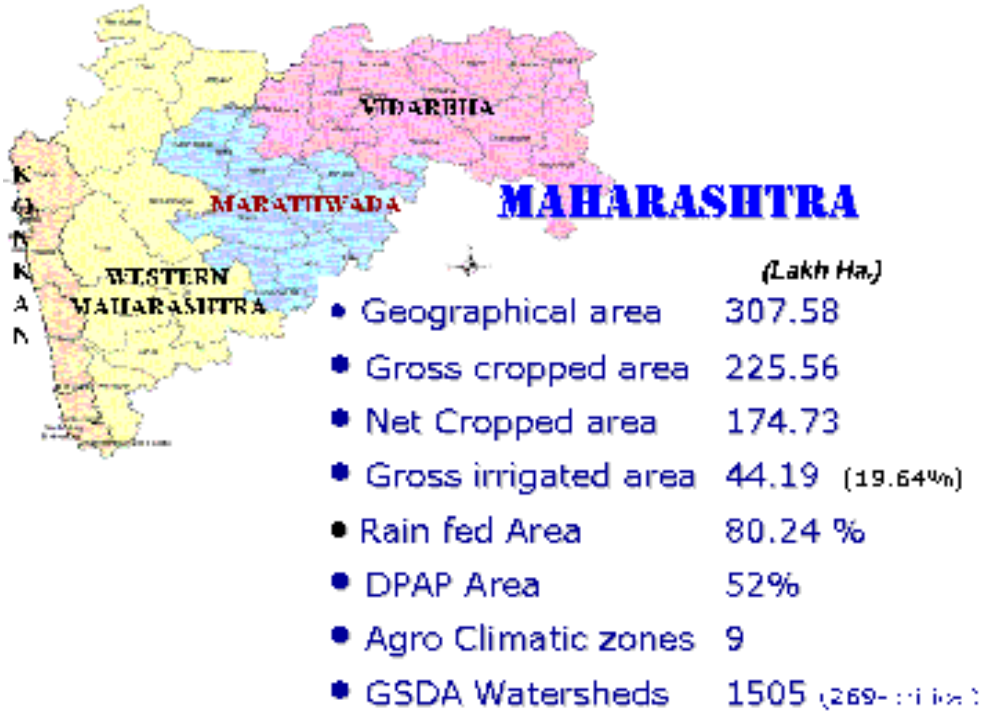
Fig. 1.3:Per Capita Consumption of Milk in the above States



1.16 MAHARASHTRA STATE DAIRY PERFORMANCE

In India the Uttar Pradesh is the leading milk producer state. Maharashtra ranks 7th in the production of milk. The western division of Maharashtra is the leading division so far as milk production is concerned. Of late the State Govt. is implementing a project through National Dairy Development Board covering Marathwada and Vidarbh Region. This is being done with a view to provide supplementary income to the farmers who are debt burdened and where the incidence of farmer's suicide is more.

Fig.1.4: Maharashtra State Map with the Revenue Divisions.



An earnest effort has been made to present the land usage pattern in Maharashtra State in Fig. 1.1 and the land holding pattern in Maharashtra State in Table 1.13.

Fig. 1.5: Land usage in the state of Maharashtra

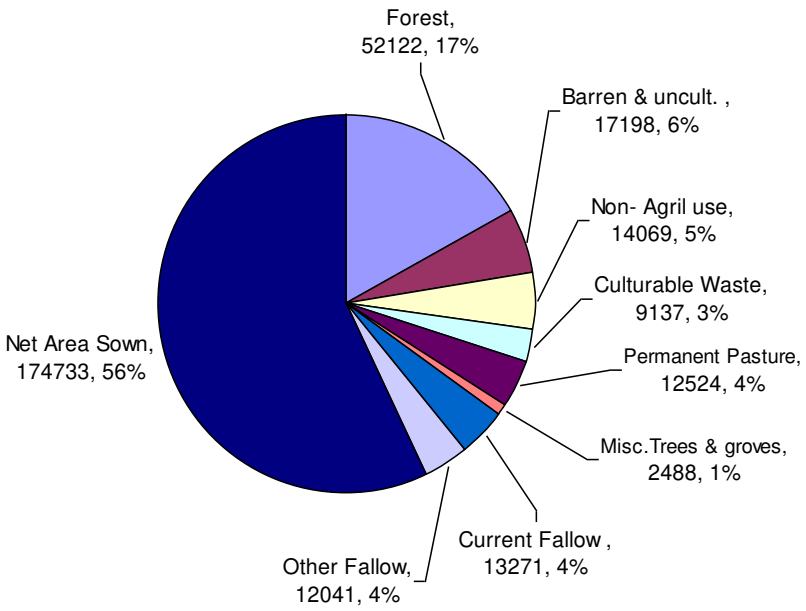


Table 1.15: Land Holding Pattern in Maharashtra

Farmers	No of Operational Holdings (Lakh)		Area (lakh Ha.)	
		%		%
Marginal	53.06	43.71	26.49	13.18
Small	36.06	29.71	51.27	25.50
Semi-Medium	22.74	18.73	61.09	30.39
Medium	8.65	7.13	48.80	24.27
Large	0.87	0.72	13.38	6.66
TOTAL	**121.38**		**201.03**	
SC	9.44	7.80	12.41	6.23
ST	7.78	6.46	15.34	7.70

Source: Data from Dairy Development Commissioner's office.

In the state of Maharashtra the major dairy activity is coordinated by the cooperative dairy sector. At the village level there are dairy societies which collect milk from their members and send it to the District Milk Union (separately registered under Maharashtra Co-Op. Society's Act) which takes it, process and send it to the identified market. The following tables depict how the dairy activity has grown over the years under various parameters.

Table 1.16: Dairy Cooperative Societies in Maharashtra

80-81	90-91	00-01	2014-15	2015-16
716	4535	16724	21082	21671

Source: National Dairy Development Board Annual Report 2015-16 page 92

Table 1.17: Dairy Cooperative Societies Producer Members in Maharashtra (Figures in thousand)

80-81	90-91	00-01	2014-15	2015-16
87	840	1398	1770	1814

Source: National Dairy Development Board Annual Report 2015-16 page 93

Table 1.18: Dairy Cooperative Societies Milk Procurement in Maharashtra (Figures in Thousand Kilograms)

80-81	90-91	00-01	2014-15	2015-16
165	1872	2979	3243	3645

Source: National Dairy Development Board Annual Report 2015-16 page 94

Table 1.19: Dairy Cooperative Societies Liquid Milk Marketing in Maharashtra & Mumbai (Figures in Thousand liters per day)

	80-81	90-91	00-01	2014-15	2015-16
Maharashtra	18	363	1178	2574	2686
Mumbai	950	1057	1390	1785	1784

Source: National Dairy Development Board Annual Report 2015-16 page 95

There has been an increase of a dairy societies by 2926.68 per cent, producer members by 1985.06 per cent, cooperative milk procurement by 2109.09 per cent and the cooperative milk marketing by 14,822.22 per cent at the end of 2016 over the year 1980-81.

Dairy development initiative of Maharashtra in Vidarbha and Marathwada regions: In the state of Maharashtra the Vidarbha and Marathwada are the two regions where the farmer's suicide was more. These farmers were not having any activity allied to agriculture and they were solely dependent on the agricultural income. To combat this situation, the government of Maharashtra entered into a MOU with NDDB to undertake dairy development activities in Vidarbha and Marathwada. For this purpose the Govt. of Maharashtra provided financial support – a grant of Rs. 3,000 million which was to be invested in the area of productivity enhancement.

1.17 LIVESTOCK IN MAHARASHTRA

The livestock census is held at an interval of five years. In the year 2012 last livestock census was carried out. According to this census the state of Maharashtra ranked sixth at the national level. The position at the state level between the two census periods i.e. 2007 and 29012 are given in the following table.

Table 1.20 : Livestock as per the 18th and 19th livestock census

Total State	Livestock Census	Cattle	Buffaloes	Sheep & Goats	Other live stock	Total Live Stock	Total poultry birds
Maharashtra	2007	16184	6073	13,301	397	35595	20,222
	2012	15484	5595	11,016	394	32489	32,489

Source: Economic Survey of Maharashtra 2016-17 (Unit '000 omitted)

The table 1.18 above indicates that there is decrease in cattle, buffaloes, during the period 2007 and 2012. This is mainly because of the urbanization as well as the awareness amongst the dairy farmers to send the totally dry cattle to the slaughter house. The production of milk is also increasing because of the improved raring practices followed by the dairy farmers.

So far as dairy activity in the State of Maharashtra, there is mainly following types of breeds popularly used. Their general information is given in the following table:

Table 1.21: Milk composition of different breeds in Maharashtra

Breed	Fat percentage	Protein Percentage	Lactose percentage
Buffalos:			
1. Mehsana	6.9	3.7	5.2
2. Delhi Murrah	6.56	3.81	5.43
3. Jafarabadi	9.0	NA	NA
4. Geer	4.73	3.22	4.85
5.Sahiwal	4.59	3.33	5.04
Cows:			
1. Holstein	3.56	3.02	4.61
2. Jersey	4.97	3.65	4.70

Source: Delaval: Dairy Farming Handbook.

The dairy activity plays a vital role in providing employment to the rural household and serves as good income source. The State ranks 7th in milk production in India while so far as consumption of per capita milk per day it ranks 17th number in India.

Table 1.22 : Production of milk and it's per capita availability

Year	Milk production MMT		Per capita availability (grams per day)	
	State	**All India**	**State**	**All India**
2012-13	8.7	132.0	213	299
2013-14	9.1	137.7	219	307
2014-15	9.5	146.3	228	322
2015-16	10.1	155.5	239	337
2016-17	10.5	N.A.	239	N.A.

Source : Economic Survey of Maharashtra 2016-17

The above data reveals that the production of milk in the state of Maharashtra is showing an increasing trend and the consumption of per capita milk is also showing marginal increasing trend.

1.18 GOVERNMENT'S ROLE IN IMPROVING DAIRY SCENERIO IN THE STATE

In order to assist the dairy farmers in India the Central Govt. as well as respective State Governments have launched several schemes which are described in brief hereunder:

1.18.1 NABARD'S Schemes for Dairy Farmers

National Bank for Agriculture and Rural Development (NABARD) has formulated comprehensive dairy farming subsidy which has been detailed in the following paragraphs. It covers all the aspects dairy farming. [14]

NABARD Dairy Farming Subsidy – Objectives

The dairy activity not only helps not only in milk production but the cow dung is a source of organic matter which improves the fertility of the soil as well as crop yields. Besides this the gobar gas from the cow dung can also be used as fuel and for lighting purposes. Depending upon the size of the livestock the gobar gas can also be used for operating small engines for watering the agricultural fields. It helps the dairy farmers to use the green fodder from the own fields for captive consumption. The NABARD's objectives for granting the subsidy for the dairy activity are as follows:

First of all, it generates self-employment and provide infrastructure for dairy sector

- To set up modern dairy farms and infrastructure for production of clean milk
- In addition, to encourage heifer calf rearing for conservation and development of good breeding stock.

[14] http://muvsi.in/nabard-dairy-farming-subsidy-how-to-get/

- ❖ To bring structural changes in the unorganized sector, so that initial processing of milk can be taken up at the village level.
- ❖ To upgrade traditional technology to handle milk on a commercial scale. Additionally, to provide value addition to milk through processing and production of milk products.

NABARD Dairy Farming Subsidy – Eligibility

1. Farmers, Individual Entrepreneur, and Groups of Unorganized and Organized Sector. A group of organized sector, includes Self-Help Groups on behalf of their members, Dairy Cooperative Societies, Milk unions on behalf of their members, Milk federation, Panchayati Raj Institutions (PRls) etc., are eligible under the scheme.
2. An applicant will be eligible to avail assistance for all components under the scheme but only once for each component.
3. More than one member of a family can be assisted under the scheme provided they set up separate units with separate infrastructure at different locations. The distance between the boundaries of two such farms should be at least 5OO m.

NABARD Dairy Farming Subsidy Schemes

- **Establishment of Dairy** : Establishment of small dairy units with crossbred cows/ indigenous description dairy cows like Sahiwal, Red Sindhi, Gir, Rathi etc / graded buffaloes up to 10 animals.
- **Investment:** Rs 5.00 lakh for 10 animal unit – minimum unit size is 2 animals with an upper limit of 10 animals.
- **Subsidy:** 25% of the outlay (33 .33 % for SC / ST farmers,) as back-ended capital subsidy subject to a ceiling of Rs 1.25 lakh for a unit of 10 animals (Rs 1.67 lakh for SC/ST farmers,). The maximum permissible capital subsidy is Rs 25000 (Rs 33,300 for SC/ST farmers) for a 2 animal unit. Subsidy shall be restricted on a pro-rata basis depending on the unit size.
- **Rearing of Calves :** Rearing of heifer calves – cross breed, indigenous description dairy breeds of cattle and of graded buffaloes – upto 20 calves

- **Investment:** Rs.4.80 lakh for 20 calf unit – minimum unit size of 5 calves with an upper limit of 20 calves.
- **Subsidy:** 25% of the outlay (33.33% for SC/ST farmers) as back-ended capital subsidy subject to a ceiling of Rs.1.20 lakh for a unit of 20 calves (Rs.1.60 lakh for SC/ST farmers). The maximum permissible capital subsidy is Rs.30000/- (Rs.40000 for SC/ST farmers) for a 5 calf unit. Subsidy shall be restricted on a pro rata basis depending on the unit size.

1.19 CHAPTER SUMMARY

This chapter gives introduction of the research topic along with the related information to have its better understanding. The topic covers perspective of Indian demographic statistics, agriculture and allied activities, historical background of the dairy activity in India, conceptual frame work, the dairy scenario at global, national and the state level.. It also covers risk factors attendant to the dairy activity and its stake holders, and the care needs to be taken etc. It has also covered the schemes for dairy development launched by the Govt. of Maharashtra, NABARD etc.

CHAPTER – II
RESEACH METHODOLOGY

2.1 INTRODUCTION

India is the largest producer of milk in the world and it is further projected to achieve the target of 180- MT by 2020. With the expected increase in the procurement and processing of milk by the organized sector, the number of dairies and the installed capacity of the existing dairies would increase further. The dairy and food industries are thus opening up new avenues for employment and economy. Dairy farming in India holds a great promise for providing sustainable livelihood particularly to small and marginal farmers in drought prone areas and is deemed to be the treasure trove. In the large part of Maharashtra, livestock rearing has emerged as an alternative option for livelihood, support besides providing 'drought proofing'.

Being agriculture oriented country almost half of the Indian population is employed in the agriculture sector. Therefore, for rural prosperity steady and sustained growth of agriculture will improve the life style in the rural areas. There are numerous dimensions to leveraging the best of diversification, risk management, technology, clean energy and corporate supply chain initiatives in the context of the Food Energy Water nexus, for substantially improving farm incomes.

Till today dairy industry is being considered as a 'secondary' industry to get supplementary source out of existing agricultural income. However, dairy industry is the only 'Agri-business' in our country which gives assured income to marginal farmers and landless agri-labourers who contribute a major share of supporting milk to milk unions.

2.2 IMPACT OF DAIRY ACTIVITY ON THE RURAL AREA

The dairy activity is predominant in the rural area and it is looked upon as a source of supplementary income. The dairy activity helps the dairy farmer to avail off liquidity position to meet his daily requirement of cash for various domestic purposes. It helps the dairy farmer a dependable source of income. Particularly it has gathered

momentum when because of the vagaries of the monsoon the Indian agriculture sector is receiving set back year after year and that because of the heavy indebtedness the agriculturists are committing suicides. This dairy activity as a source of assured complementary income has been in focus and the agriculturists are persuaded to start this dairy activity. India is having the largest livestock population in the world. However, the productivity of milk is less if we compare it to with the world. The scientists and the dairy farmers are also putting their efforts to increase the same by adopting new technologies and educating the dairy farmers. Wherever required the Govt. of India is also providing subsidies to the deserving dairy farmers. Even though our per capita daily consumption of milk is showing an increasing trend, compared to the developed countries it is less and we have scope to further improve it. The dairy experts based on the latest data have observed that there is a tremendous scope for the dairy activity in the Indian context and that we should exploit this opportunity.

2.3 RELEVANCE OF THE STUDY

In the Indian agricultural scenario the livestock play a pivotal role. It is the back bone of the rural India. This dairy activity is pursued as an activity allied to agriculture. The landless labour also takes up dairy activity but their contribution is marginal. The livestock not only produce direct food but it also provide key inputs to agricultural crops. Livestock is an alternative for farm mechanization to a great extent.

Normally the agriculturists receive the sale proceeds of the crops grown only on harvesting and the consequent marketing of it. Thus the agriculturists get money seasonally. However, in the case of dairy activity which is an allied activity the agriculturist receives the sale proceeds of the milk at fortnightly or monthly interval which helps the agriculturist to meet his day to day requirement of the liquid cash. The surplus generated also helps him to effect purchases of the agricultural requirement. In India there are three seasons in agriculture. Therefore, agricultural income is seasonal. In such a situation even a small livestock which has high rate of reproduction and speedy growth, helps the dairy farmer to have dependable source of income from the sale of milk

The agriculturists who are pursuing dairy activity can maintain the fertility of their land by using farm yard manure (FYM). Of late, it has been observed that there is an increasing awareness amongst the agriculturists about adopting the organic farming practices and the produce of organic farming is very much in demand although it is bit costly. This is mainly because of the greater awareness about the quality of the agriculture produce that one gets has hazardous effect on the human body because of the excessive use of chemical fertilizers. In good old days the farmers were maintaining sizable livestock. Now there is a tendency to develop and maintain livestock to reap the benefits of organic farming. In this organic farming the productivity is more and the realization of the crop proceeds is also sizable.

The productive livestock on the idle land adds to its value. Even in the other parts of the world a combination of the agriculture and dairy as an activity allied to agriculture is very much encouraged. Indian situation on this front is not an exception to this ideology. The bye-products available from each of the agricultural output can be used to economically pursue the dairy activity more profitably. E.g. the cereal crop residues can be as input in the dairy activity for enriching the cattle feed. Of late, it has been observed that the crop residues are now being used in manufacture of blocks as a solid waste fuel which in turn may adversely affect availability of this material for the dairy animals in course of time. The cow dung is used for generating energy as well as the organic fertilizer which improves the quality of the land. Therefore, dairy activity should not be looked upon as a mere source of milk and its sale proceeds.

2.4 OBJECTIVES OF THE STUDY

The researcher has a rich experience of the management of the large size dairy unit in Pune District. He is also having a veterinary background being a post graduate in veterinary science. He had also an opportunity to interact with various dairy farmers as well as the small, medium and managements of large sized dairy projects. Hence, he has rich knowledge of the developments in the dairy activity over the past two decades.

The researcher has framed the following objectives for this research bearing in mind the title of the research.

a To study the contribution of dairy animals in the economic development of the rural area.

b To study the level of awareness of risks in managing the livestock and the remedial measures being adopted by the dairy farmers/Dairy Cooperative societies as the risks eliminate the earnings from the dairy activity.

c To study the grass root level problems faced by these dairy farmers in Pune District and to suggest suitable remedial steps to mitigate these problems.

Justification for the Objectives

The dairy activity as an activity allied to agriculture is having a fair contribution to the economic development of the rural area. This activity is being pursued in the rural area as it is an allied activity. In the rural area the agriculturists get good climate, adequate land is available, availability of the green fodder which is also a key requirement for the maintenance of the livestock. The dairy activity provides ready money at fortnightly or monthly interval which provide liquid money with the dairy farmer which helps him to meet his daily requirement. This gives boost to the other economic activities get going. In this way the maintenance of livestock and the dairy activity is pace setter for the rural economic development. How far this phenomenon is operating at the grass root level is the objective of this research. Therefore, the objective number one justifies this study.

It is also necessary to find out the current level of awareness of the dairy farmers about the maintenance of the livestock, their selection, space requirement, food and feed requirements, health care requirements, and obtaining clean milk and its onward supply to the village level dairy milk producers society etc. What care is required to be taken of the livestock? Which are the agencies that will help in ensuring healthy livestock and increasing milk production? What is the probable solution to tide over the problems encountered in ensuing efficient and profitable dairy activity? All these aspects are required to be studied right from the grass root level to the middle level functionaries and finally the role that the district level milk producer's unions is performing. The solutions to these problems and how to

strengthen the hands of the dairy farmers to improve their present milk collection and increase the dairy activity to earn better income and have a better life style. This research study is addressed to this aspect also.

In the entire dairy operations the stakeholder at the district level is the district milk producers Union which collects the milk process it and sells it to the ultimate consumers through their network spread over in the district. In this context the researcher is also would like to study the role played by the particularly in identifying the problems faced at the grass root level by the dairy farmers who are supplying the milk to the village societies and also the problems faced by the village level societies. This will enable the researcher to suggest practical solutions and assist the stakeholders to come out aggressively to meet the challenge of achieving higher targets of milk production. It is in this context the third objective of this research is relevant.

2.5 HYPOTHESES OF THE STUDY

The researcher is a veterinary post graduate and has had field experience of management of dairy farming. Therefore, on the basis of the experience that he had gained the researcher has formulated the following hypotheses.

H_1 Dairy activity as allied activity to agriculture significantly contributes to the rural economy despite its attendant risks which need management skills.

H_2 In view of the contribution of dairy to the economic development of the rural area still there is a wide scope to enlarge the dairy activity.

H_3 The cooperative dairy organizations are playing a key role to financially strengthen the rural farmers.

Justification of the Hypotheses

The Indian agriculture is mainly dependent on the vagaries of the monsoon. There is no dependent source of water which will ensure fair agricultural yield. As a result in the large agricultural land seasonal crops are cultivated. A consequence of this the agriculturist is not deployed for the agriculture throughout the day and he has much spare time in which he can be gainfully employed. Over the years it has been

identified that some economic activities which are complementary to the principal economic activity i.e. agriculture, can be pursued by the agriculturists. These activities are termed as "Activities allied to or complementary to Agriculture". That is to say that the agriculturists can simultaneously run this activity and add to his income kitty. These activities are dairy, poultry, fishery, beekeeping, piggery etc. Amongst all these sub activities dairy is the most popularly undertaken and even the female members of the family can take care of this activity very well. Due to conscious efforts put in the Agriculture department after the independence the dairy activity has made a significant contribution to the Indian economy. The figures already mentioned in the chapter I, throw light on the growth of the activity. Between 1956 onward till 1996 there was Operation Flood and since then White Revolution has made tremendous contribution to the dairy farmer's income. Since last 15 years India is number one in the world in respect of milk production. This has resulted in the improvement in the life style of the rural masses considerably. This being the case the researcher has postulated hypothesis No.1.

As the time passes, because of the education, as well as various new economic activities the income level in the rural as well as urban areas has shown increasing trend. The increase in the income level naturally translated into the increase in purchasing power of the masses. As compared to the western world our per capita milk consumption is still at low rate and there is scope for the improvement. The value added products from the milk have added to the dairy scenario. Therefore, the researcher is of the view that there is still untapped potential in the dairy sector and if properly planned we can explore the opportunity and increase the dairy production. This justifies the second hypothesis.

In the rural area the cooperative movement has grown and well established all over India in general and states like Maharashtra, Gujarat, Karnataka, UP in particular. The cooperative sector has well set up its dairy activity in the rural area wherein at the village level there is a cooperative society of milk producers, at the District level there is District level milk producers union registered as per the cooperative societies Act. This district union establishes its collection cooling centres in the district as per the convenience and finally processes the milk and turn out the

value added milk products. The major part of the milk collection and the other milk products processing is attended to by the Cooperative sector. This dairy activity enables the dairy farmers to earn ready cash to meet their liquidity requirement. This adds to the purchasing power of the rural masses which in turn gear up the rural economy. This justifies the third hypothesis.

2.6 RESEARCH METHODOLOGY

The title of this research is **"Critical Analysis of Risk Management Involved in Maintenance of Livestock and its Effect on Rural Economy".** It is an explorative type of research for which extensive primary data has been collected and the same has been analyzed and interpreted and observations have been recorded and wherever necessary suggestions have been offered. Thus, it is an empirical research based on analysis of primary and secondary data.

2.6.1 Significance of the study

Over the past two decades the dairy activity has been receiving a set back from viability point of view. The rates of the cattle as well as the dairy feed have been rising at a high rate and at the same there is no corresponding growth in the prices fetched by the milk and milk products. As a result the dairy activity if not properly managed is becoming an uneconomic activity. Therefore, the dairy farmers are taking risks in running the dairy activity. The risks are at various stages of the dairy activity. Therefore, the researcher is of the considered view that a critical analysis of risk management involved in the maintenance of livestock and its impact on the rural economy is a very live issue that needs to be studied. On this back drop the researcher is of the view that the research topic is quite significant to the current situation.

The present Central Govt. has kept a target to double the income of the agriculturists by 2022 and for that purpose in the budget for 2018-19 a sizable amount of provision for agriculture sector has been planned. The government is very well convinced about the potential offered by the dairy activity both for increasing the income as well as employment generation and hence taking into account the probable growth of the dairy industry this present research is quite significant.

2.7 SCOPE OF THE STUDY

(i) Geographical Scope and selection of the sample area

The geographical scope of study is limited to Dairy units irrespective of ownership (whether private, coop. or corporate sector) functioning in 13 Talukas of Pune District. There are 14 Talukas (including Pune City) in the Pune District. However, Pune being a metropolitan city and the dairy activity is relatively less this Taluka has been excluded for this research purpose. The table 2.1 depicts the Talukas of Pune district with number of villages, population as per 2011 census, and the number of dairy societies functioning in those Talukas. Efforts have also been taken to depict Talukawise position of the livestock and the milk collection in each Taluka which is presented in table 2.1.

Table 2.1 : Taluka Wise Number of Villages, Gender Wise Population and dairy societies in the Talukas (Position as on 31.3.2016)

Sr. No.	Name of the Taluka	No. of villages	Population as per 2011 census			No. of Dairy Units as of April 2017 (Coop.+ Pvt.)
			Male	Female	Total	
1	Ambegaon	143	119226	116746	235972	15
2	Baramati	117	221094	208506	429600	8
3	Bhor	195	94158	91958	186116	6
4	Daund	103	196283	184213	380496	22
5	Haveli	108	1316346	1119235	2435581	8
6	Indapur	143	198801	184382	383183	8
7	Junnar	183	202360	196942	399302	14
8	Khed	188	237868	212248	450116	11
9	Maval	187	198487	179072	377559	3
10	Mulshi	144	90053	80953	171006	0
11	Pune City	-	1700867	1604021	3304888	67
12	Purandhar	108	119906	115753	235659	4
13	Shirur	117	201152	184262	385414	19
14	Velhe	130	27504	27012	54516	1
	Total	**1866**	**4924105**	**4505303**	**4505303**	**186**

Source: Data collected from Dist. Statistical Office, Pune

Table 2.2: Taluka wise position of livestock and the Milk Collection in each Taluka , Rs. in lakhs

Sr. No.	Name of the Taluka	No. of Villages	No. of Livestock
1	Ambegaon	143	49
2	Baramati	117	193
3	Bhor	195	75
4	Daund	103	123
5	Haveli	108	135
6	Indapur	143	235
7	Junnar	183	66
8	Khed	188	98
9	Maval	187	55
10	Mulshi	144	46
11	Pune City	-	-
12	Purandhar	108	95
13	Shirur	117	128
14	Velhe	130	24
	Total	**1866**	**1322**

Source: Data Collection from Statistics section, District Deputy Registrar of Coop. Societies, Pune

Pune district has been divided for the purpose of administrative convenience in following six revenue sub divisions:

Baramati Sub Div.	**Bhor Sub.Div.**	**Pune Sub. Div.**	**Pimpri Chinchwad ***
Baramati	Purandar	Haveli	
Daund	Velhe	Pune City *	
Indapur	Bhor		

Khed Sub Div.	**Maval Sub. Div.**
Khed	Maval
Ambegaon	Mulshi
Junner	
Shirur	

The researcher has included the Taluka using the following parameter:

1. The Taluka identified should be predominantly a rural area. Hence, Pune Taluka has been excluded.
2. In Baramati Taluka exception has been made and three Talukas are identified. In Pune district Baramati and Indapur Talukas were isolated from the rest of the Talukas so far as registration of District Milk Producers Union and they were given separate registration. Of these two Talukas, Indapur Taluka unit is nonfunctional and hence some of the milk producers societies the milk producers in the said Taluka supply the milk to Pune District Milk Producers Union and Baramati continues to be a separate unit which is functioning. Therefore, the researcher felt that inclusion of Baramati Taluka will add an additional dimension to the study as we can find out if something new, novel has been done by that unit.
3. Therefore, the researcher has finally identified 13 Talukas of Pune district excluding Pune metropolitan Taluka.

Criteria for identifying the dairy societies

The dairy societies have been randomly identified observing the following parameters:

1) Dairy Coop. Societies which have the highest collection
2) Dairy Coop. Societies which have the district average collection
3) Dairy Coop. Societies which have the lowest collection

Since this research is also useful to the organization in which the researcher is employed, it was considered to have rather wider coverage of the societies and therefore, over and above the criterion mentioned above, some additional societies have been also included from where major milk supply is received by the District Dudh Sangh.

Criteria applied for identification of the dairy farmers

Classification of agriculturists based on the land holding

NABARD has made a standard classification of the agriculturists prescribing land holding criterion as follows:

Table 2.3: NABARD's categorization of the farmers based on holding

Marginal	Small	Semi Medium	Medium	Large
Land holding less than 1 Ha	Higher than 1 Ha but less than 2 Ha.	Higher than 2 Ha but less than 4 Ha	Higher than 4 Ha but less than 10 Ha	Over 10 Ha.

Keeping the NABARD classification of the agriculturists the researcher has identified minimum of 10 dairy farmers from each category with the exception of large farmers in which case only 15 dairy farmers have been identified. While selecting the respondents the researcher has also taken care to include even the landless labour which is also undertaking dairy activity. Thus, the total per dairy sample size works out to 750 dairy farmers.

While identifying the dairy farmers care has also been taken to see that there is inclusion of farmers belonging to SC/ST category.

Thus taking overall view the sample Talukas, sample societies and the sample dairy farmers have been scientifically identified and the sample is truly representative.

Table 2.4: Taluka wise identified Dairy societies and their milk production

				Peak Period		Lean Period	
Sr. No.	**Taluka**	**No.**	**Name of the Dudh Society and village name**	**Peak Period Liter Per Month**	**Peak Period Average Liters P/Day**	**Lean Period Liters Per Month**	**Lean Period Average Liters Per Day**
1	**Ambegaon**	1	Bhimashankar Ssahkari Dudh Utpadak Sanstha Maryadit, Shindemala	21536	695	13759	444
		2	Kathapur Budruk Sahkari Dudh Utpadak Sanstha Maryadit, Kathapur Budruk	44686	718	29519	1054
		3	Kirantai Mmahila Sahkari Dudh Utpadak Sanstha Maryadit, Khadakwadi	164	25	43	18
		4	Radhakrishana Mahila Sahkari Dudh Utpadak Sanstha Maryadit, Jadhavwadi	28645	955	15305	494
		5	Shivshankar Sahkari Dudh Utpadak Sanstha Maryadit, Thorandale	82076	2648	64702	2157
		6	Shri Wyankeshwar Ssahkari Dudh Utpadak Sanstha Maryadit, Peth	75324	2511	5686	183

				Peak Period		Lean Period	
Sr. No.	**Taluka**	**No.**	**Name of the Dudh Society and village name**	**Peak Period Liter Per Month**	**Peak Period Average Liters P/Day**	**Lean Period Liters Per Month**	**Lean Period Average Liters Per Day**
2	**Bhor**	7	Nere Vibhag Ssahkari Dudh Utpadak Sanstha Maryadit, Nere	32354	1044	9006	291
		8	Padmavati Mahila Ssahkari Dudh Utpadak Sanstha Maryadit, Hamas	8362	279	945	30
		9	Utarwali Vibhag Ssahkari Dudh Utpadak Sanstha Maryadit, Utarwali	17287	558	10992	366
3	**Daund**	10	Pandurang Ssahkari Dudh Utpadak Sanstha Maryadit, Chandgudewadi - delwadi	11032	368	5492	177
		11	Sushila Mahila Ssahkari Dudh Utpadak Sanstha Maryadit, Khanota	357667	11538	159832	5708
4	**Haveli**	12	Gopal Ssahkari Dudh Utpadak Sanstha Maryadit, Tilekarwadi	6893	222	2508	81
		13	Kamdhenu Mahila Ssahkari Dudh Utpadak Sanstha Maryadit, Urulikanchan	1844	61	1140	41
		14	Rajhans Ssahkari Dudh Utpadak Sanstha Maryadit, urlikanchan	2059	69	1152	38
5	**Indapur**	15	Avinash Ssahkari Dudh Utpadak Sanstha Maryadit, Indapur	88850	2866	5255	170
		16	Ganesh Ssahkari Dudh Utpadak Sanstha Maryadit, Kurvali	40246	1298	11318	365
		17	Rajendra Ssahkari Dudh Utpadak Sanstha Maryadit, Bambadwadi	27568	889	8383	270
6	**Junnar**	18	Shri Biroba Maharaj Ssahkari Dudh Utpadak Sanstha Maryadit, Vadgaon Kandali	116425	3756	94995	3167
		19	Kalambjai Ssahkari Dudh Utpadak Sanstha Maryadit, Hivare Turf Narayangaon	19053	615	11483	383
		20	Shri Kashinath Baba Ssahkari Dudh Utpadak Sanstha Maryadit, Khanapur	10186	329	6372	228
		21	Muktai Ssahkari Dudh Utpadak Sanstha Maryadit, Pargaon Tarphe Madh	17073	551	5072	181
		22	Kandali Nagadwadi Ssahkari Dudh Utpadak Sanstha Maryadit, Nagadwadi	16621	554	13453	448
		23	Narayangaon group Ssahkari Dudh Utpadak Sanstha Maryadit, Narayangaon	18540	618	11804	393
		24	Shivshakti Ssahkari Dudh Utpadak Sanstha Maryadit, Vadgaon Sahani	24887	803	19767	659
		25	Shri Datta Ssahkari Dudh Utpadak Sanstha Maryadit, Hiware-Narayangaon	80761	2605	59227	1974
		26	Shri Hanuman Ssahkari Dudh Utpadak Sanstha Maryadit, Warcha Zap	12764	425	10085	325

				Peak Period		Lean Period	
Sr. No.	**Taluka**	**No.**	**Name of the Dudh Society and village name**	**Peak Period Liter Per Month**	**Peak Period Average Liters P/Day**	**Lean Period Liters Per Month**	**Lean Period Average Liters Per Day**
		27	Vasantdada Ssahkari Dudh Utpadak Sanstha Maryadit, Sutar thike(Kandali)	19308	623	15947	514
		28	Weerbhadra Ssahkari Dudh Utpadak Sanstha Maryadit, Pangari Terf Madh	15318	494	6163	220
7	**Khed**	29	Balasaheb Shete Ssahkari Dudh Utpadak Sanstha Maryadit, Wakad	103884	3351	24833	801
		30	Bhairavnath Ssahkari Dudh Utpadak Sanstha Maryadit, Khopewadi	2901	94	1027	34
		31	Bhairavnath Ssahkari Dudh Utpadak Sanstha Maryadit, Koye	3510	117	732	24
		32	Gurukrupa Ssahkari Dudh Utpadak Sanstha Maryadit, Chinchoshi	6513	217	3380	113
		33	Gurukrupa Ssahkari Dudh Utpadak Sanstha Maryadit, Pabe	1550	50	1395	50
		34	Jay Hanuman Ssahkari Dudh Utpadak Sanstha Maryadit, Chandus	7777	251	2396	77
		35	Mahadeo Ssahkari Dudh Utpadak Sanstha Maryadit, Phansewadi	3370	112	1995	71
		36	Mauli Ssahkari Dudh Utpadak Sanstha Maryadit, Sopawasti	17667	570	2143	77
		37	New Bhiravnath Ssahkari Dudh Utpadak Sanstha Maryadit, Kaman Barapati	9163	296	3968	142
		38	Sadichha Ssahkari Dudh Utpadak Sanstha Maryadit, Shel Pimpalgaon	147826	4769	96410	3110
8	**Maval**	39	Bhairvnath Ssahkari Dudh Utpadak Sanstha Maryadit, Ozarde	661	21	306	11
		40	Sudha Ssahkari Dudh Utpadak Sanstha Maryadit, Sudumbare	21936	731	16919	546
		41	Trimurti Mahila Ssahkari Dudh Utpadak Sanstha Maryadit, Inglun	10416	336	1766	63
		42	Trimurti mahila Ssahkari Dudh Utpadak Sanstha Maryadit, Wadeshwar (Shindewadi)	2769	92	784	25
9	**Mulshi**	43	Jamgaon vibhag bhairavna Ssahkari Dudh Utpadak Sanstha Maryadit, Jamgaon	13078	436	6292	203
10	**Purandhar**	44	Bhairvanath mahila Ssahkari Dudh Utpadak Sanstha Maryadit, Singapur	18056	582	8930	288
		45	Laxmi mahila Ssahkari Dudh Utpadak Sanstha Maryadit, Jawlarjun	12750	425	6550	211
		46	Shivshambo Ssahkari Dudh Utpadak Sanstha Maryadit, Dhalewadi	12978	419	8162	263

				Peak Period		Lean Period	
Sr. No.	**Taluka**	**No.**	**Name of the Dudh Society and village name**	**Peak Period Liter Per Month**	**Peak Period Average Liters P/Day**	**Lean Period Liters Per Month**	**Lean Period Average Liters Per Day**
		47	Shri Ganesh Ssahkari Dudh Utpadak Sanstha Maryadit, Bhivari	16768	559	8117	271
11	**Shirur**	48	Bhagyashri Ssahkari Dudh Utpadak Sanstha Maryadit, Pimpalsuti	12661	408	1479	49
		49	Rajmata Mahila Ssahkari Dudh Utpadak Sanstha Maryadit, Rajangaon Sandas	23622	762	3000	100
		50	Sainikbhau dhokale Ssahkari Dudh Utpadak Sanstha Maryadit, Karandi	126879	4093	106862	3447
		51	Savitri Mahila Ssahkari Dudh Utpadak Sanstha Maryadit, Sonesangavi	14865	480	9809	350
		52	Shimjai Ssahkari Dudh Utpadak Sanstha Maryadit, Lokhandewasti, Ranjangaon	20567	663	15021	501
12	**Velha**	53	Vinzar Ssahkari Dudh Utpadak Sanstha Maryadit, Vinzar	3687	119	196	6
		54	Shri Jakhanimata Ssahkari Dudh Utpadak Sanstha Maryadit, Antroli	15141	488	395	13
		55	Shri Jananiaai Mahila Ssahkari Dudh Utpadak Sanstha Maryadit, Rule (Halandewadi)	4333	140	258	8
13	**Baramati**	56	Bormalnath Dudh Utpadak Sanstha Maryadit, Dhakale	160	150	122	68
		57	Hanuman Dudh Utpadak Sanstha Maryadit, Khamgalwadi	140	140	118	58
		58	Panchartna Dudh Utpadak Sanstha Maryadit, Murti	450	400	238	185
		59	Someshwar Dudh Utpadak Sanstha Maryadit,	100	100	67	48
		60	Shri Siddheshwar Dudh Utpadak Sanstha Maryadit,	1700	1650	1365	889

Source: Field survey data collected from District Deputy Registrar of Coop. Societies, Pune.

Sample Selected:

Society wise identified respondents

				Identified Dairy Farmers
Sr. No.	**Taluka**	**No.**	**Name of the Dudh Society and village name**	
1	**Ambegaon**	1	Bhimashankar Sahkari Dudh Utpadak Sanstha Maryadit, Shindemala	15
		2	Kathapur Budruk Sahkari Dudh Utpadak Sanstha Maryadit, Kathapur Budruk	15
		3	Kirantai Mmahila Sahkari Dudh Utpadak Sanstha Maryadit, Khadakwadi	10
		4	Radhakrishana Mahila Sahkari Dudh Utpadak Sanstha Maryadit, Jadhavwadi	15
		5	Shivshankar Sahkari Dudh Utpadak Sanstha Maryadit, Thorandale	10
		6	Shri Wyankeshwar Ssahkari Dudh Utpadak Sanstha Maryadit, Peth	10
2	**Bhor**	7	Nere Vibhag Ssahkari Dudh Utpadak Sanstha Maryadit, Nere	15
		8	Padmavati Mahila Ssahkari Dudh Utpadak Sanstha Maryadit, Hamas	10
		9	Utarwali Vibhag Ssahkari Dudh Utpadak Sanstha Maryadit, Utarwali	15
3	**Daund**	10	Pandurang Ssahkari Dudh Utpadak Sanstha Maryadit, Chandgudewadi-delwadi	15
		11	Sushila Mahila Ssahkari Dudh Utpadak Sanstha Maryadit, Khanota	15
4	**Haveli**	12	Gopal Ssahkari Dudh Utpadak Sanstha Maryadit, Tilekarwadi	15
		13	Kamdhenu Mahila Ssahkari Dudh Utpadak Sanstha Maryadit, Urulikanchan	10
		14	Rajhans Sahkari Dudh Utpadak Sanstha Maryadit, urlikanchan	10
5	**Indapur**	15	Avinash Ssahkari Dudh Utpadak Sanstha Maryadit, Indapur	15
		16	Ganesh Sahkari Dudh Utpadak Sanstha Maryadit, Kurvali	10
		17	Rajendra Sahkari Dudh Utpadak Sanstha Maryadit, Bambadwadi	15
6	**Junnar**	18	Shri Biroba Maharaj Ssahkari Dudh Utpadak Sanstha Maryadit, Vadgaon Kandali	15
		19	Kalambjai Sahkari Dudh Utpadak Sanstha Maryadit, Hivare Turf Narayangaon	15
		20	Shri Kashinath Baba Sahkari Dudh Utpadak Sanstha Maryadit, Khanapur	15
		21	Muktai Ssahkari Dudh Utpadak Sanstha Maryadit, Pargaon Tarphe Madh	15
		22	Kandali Nagadwadi Ssahkari Dudh Utpadak Sanstha Maryadit, Nagadwadi	15
		23	Narayangaon group Ssahkari Dudh Utpadak Sanstha Maryadit, Narayangaon	10
		24	Shivshakti Ssahkari Dudh Utpadak Sanstha Maryadit, Vadgaon Sahani	10
		25	Shri Datta Ssahkari Dudh Utpadak Sanstha Maryadit, Hiware-Narayangaon	15

				Identified Dairy Farmers
Sr. No.	**Taluka**	**No.**	**Name of the Dudh Society and village name**	
		26	Shri Hanuman Ssahkari Dudh Utpadak Sanstha Maryadit, Warcha Zap	10
		27	Vasantdada Ssahkari Dudh Utpadak Sanstha Maryadit, Sutar thike(Kandali)	10
		28	Weerbhadra Ssahkari Dudh Utpadak Sanstha Maryadit, Pangari Terf Madh	10
7	**Khed**	29	Balasaheb Shete Ssahkari Dudh Utpadak Sanstha Maryadit, Wakad	15
		30	Bhairavnath Ssahkari Dudh Utpadak Sanstha Maryadit, Khopewadi	10
		31	Bhairavnath Ssahkari Dudh Utpadak Sanstha Maryadit, Koye	10
		32	Gurukrupa Ssahkari Dudh Utpadak Sanstha Maryadit, Chinchoshi	10
		33	Gurukrupa Ssahkari Dudh Utpadak Sanstha Maryadit, Pabe	10
		34	Jay Hanuman Ssahkari Dudh Utpadak Sanstha Maryadit, Chandus	10
		35	Mahadeo Ssahkari Dudh Utpadak Sanstha Maryadit, Phansewadi	10
		36	Mauli Ssahkari Dudh Utpadak Sanstha Maryadit, Sopawasti	15
		37	New Bhiravnath Ssahkari Dudh Utpadak Sanstha Maryadit, Kaman Barapati	10
		38	Sadichha Ssahkari Dudh Utpadak Sanstha Maryadit, Shel Pimpalgaon	15
8	**Maval**	39	Bhairvnath Sahkari Dudh Utpadak Sanstha Maryadit, Ozarde	10
		40	Sudha Sahkari Dudh Utpadak Sanstha Maryadit, Sudumbare	15
		41	Trimurti Mahila Sahkari Dudh Utpadak Sanstha Maryadit, Inglun	10
		42	Trimurti mahila Ssahkari Dudh Utpadak Sanstha Maryadit, Wadeshwar (Shindewadi)	10
9	**Mulshi**	43	Jamgaon vibhag bhairavna Sahkari Dudh Utpadak Sanstha Maryadit, Jamgaon	15
10	**Purandhar**	44	Bhairvanath Mahila Sahkari Dudh Utpadak Sanstha Maryadit, Singapur	15
		45	Laxmi Mahila Sahkari Dudh Utpadak Sanstha Maryadit, Jawlarjun	10
		46	Shivshambo Ssahkari Dudh Utpadak Sanstha Maryadit, Dhalewadi	10
		47	Shri Ganesh Ssahkari Dudh Utpadak Sanstha Maryadit, Bhivari	15
11	**Shirur**	48	Bhagyashri Ssahkari Dudh Utpadak Sanstha Maryadit, Pimpalsuti	10
		49	Rajmata Mahila Ssahkari Dudh Utpadak Sanstha Maryadit, Rajangaon Sandas	15
		50	Sainikbhau dhokale Ssahkari Dudh Utpadak Sanstha Maryadit, Karandi	15
		51	Savitri Mahila Sahkari Dudh Utpadak Sanstha Maryadit, Sonesangavi	15
		52	Shimjai Sahkari Dudh Utpadak Sanstha Maryadit, Lokhandewasti, Ranjangaon	10
12	**Velha**	53	Vinzar Sahkari Dudh Utpadak Sanstha Maryadit, Vinzar	10
		54	Shri Jakhanimata Ssahkari Dudh Utpadak Sanstha Maryadit, Antroli	15

				Identified Dairy Farmers
Sr. No.	**Taluka**	**No.**	**Name of the Dudh Society and village name**	
		55	Shri Jananiaai Mahila Ssahkari Dudh Utpadak Sanstha Maryadit, Rule (Halandewadi)	10
13	**Baramati**	56	Bormalnath Dudh Utpadak Sanstha Maryadit, Dhakale	15
		57	Hanuman Dudh Utpadak Sanstha Maryadit, Khamgalwadi	10
		58	Panchartna Dudh Utpadak Sanstha Maryadit, Murti	15
		59	Someshwar Dudh Utpadak Sanstha Maryadit, Someshwar	10
		60	Shri Siddheshwar Dudh Utpadak Sanstha Maryadit, Pandhare	15
			Total respondents for this study	**750**

ii) Operational Scope:

Aspects considered for identifying the Talukas:

1) Every Taluka in Pune district barring Pune Metropolitan have been included in this research.
2) The livestock population in the Taluka and the number of dairy societies in it.

2.8 PRIMARY DATA

2.8.1 Parameter for identifying the class of societies for the study

In each Taluka there is a presence of primary cooperative milk societies wherein the dairy farmers maintaining livestock supply the milk. The dairy society collects the milk and supplies it to the District level Dudh Society where it is processed and various products as per demand from the market are taken and finally sent to the market. While randomly selecting the primary dairy from each of the Talukas care has been taken to see that a society collecting maximum, minimum and average milk has been identified.

2.8.2 Sources of Data

This research is based on the primary data collected from the major stake holders and the thrust has been on management of the livestock in the identified study area.

2.8.3 Primary Data

The primary data has been collected from the principal stakeholders in the dairy activity i.e. dairy farmers and the Taluka level milk producers' societies. The primary milk producers maintain the livestock and the Taluka level milk producers' societies collect the milk and send it to the District Dairy Union.

2.8.4 Secondary Data

In order to get himself appraised of the research topic the researcher has visited various libraries and research centers and collected the data. The researcher had visited the office of the Commissioner for Cooperation, Directorate of Animal Husbandry, Pune, College of Agricultural Banking of the Reserve bank of India, and also the Pune District Central Cooperative Bank's Head office at Pune. Through these visits the researcher has collected the secondary data.

2.8.5 Technique Used for selection of Sample

Sample size calculation[15]

For the purpose of arriving at representative sample size the researcher had used the following detailed scientific process. For the selection of the sample in primary data collection process the researcher has used random sampling method.

2.8.6 Technique of Data Collection

Entire primary data has been collected through interview schedules and through structured questionnaires. Researcher has prepared a detailed and comprehensive questionnaire and interview schedules of different types to collect primary data.

I. Questionnaire for Secretary / Board of Directors of Milk societies

II. Questionnaire for dairy farmers who supply milk to the dairy society.

Since the respondents from both the segments were comfortable to read and understand the questionnaire in the regional language it was made in Marathi – the

[15] Source: http://www.raosoft.com/samplesize.html

local language. Copies of the questionnaires and interview schedules duly translated into English are given at the end of the thesis in Annexure.

2.8.7 Statistical Techniques for analysis of Data

For the purpose of analyzing the primary data collected the researcher has used standard statistical tools namely, percentage, diagrams and graphs, descriptive Statistics which includes mean, Standard Deviation etc. For validation of the hypotheses formulated originally for this research the researcher has used Chi-square test which has been briefly described in the following paragraphs.

- **CHI-Square Test:** This test is used to determine whether hypothesized results are verified by an experiment. This approach consists of four steps: (1) state the hypotheses, (2) formulate an analysis plan, (3) analyze sample data, and (4) interpret results.

  Every hypothesis test requires the analyst to state a null hypothesis (H_0) and an alternative hypothesis (H_1). The hypotheses are stated in such a way that they are mutually exclusive. That is, if one is true, the other must be false; and vice versa.

Chi-square Test for Independence

The test is applied when you have two categorical variables (or attributes) from a single population. It is used to determine whether there is a significant association between the two variables. (two groups of variable)

For example, in an election survey, voters might be classified by gender (male or female) and voting preference (Democrat, Republican, or Independent). We used Chi-square test for independence to determine whether gender is related to voting preference.

The Chi-square statistic is a non-parametric (distribution free) tool designed to analyze group differences when the dependent variable is measured at a nominal level. Like all non-parametric statistics, the Chi-square is robust with respect to the distribution of the data. Specifically, it does not require equality of variances among

the study groups or homoscedasticity in the data. It permits evaluation of both dichotomous independent variables, and of multiple group studies. Unlike many other non-parametric and some parametric statistics, the calculations needed to compute the Chi-square provide considerable information about how each of the groups performed in the study.

This richness of detail allows the researcher to understand the results and thus to derive more detailed information from this statistic than from many others.

Test of Independence of Attributes

(m x n contingents table)

Suppose that the give data are classified in to m levels of Attribute A denoted by A_1, A_2 ……A_m and n levels of attribute B denoted by B1, B2……..Bn. Then different class frequencies can be represented in the following tabular from.

A/B	**B_1**	**B_2**	**……**	**B_j**	**……**	**B_n**	**Total**
A_1	O_{11}	O_{12}	……	O_{1j}	……	O_{1n}	(A_1)
A_2	O_{21}	O_{22}	……	O_{2j}	……	O_{2n}	(A_2)
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
A_i	O_{i1}	O_{i2}	……	O_{ij}	……	O_{in}	(A_i)
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
A_m	O_{m1}	O_{m2}	……	O_{mj}	……	O_{mn}	(A_m)
Total	**(A_1)**	**O_{i1}**	**(B_2)**	**(B_j)**	**……**	**(B_n)**	**N**

Above table containing m rows and n columns is called m x n contingency table.

Where, O_{ij} is observed frequency corresponding to $(i, j)^{th}$ cell.

$N = \sum_{i_{21}}^{m} \sum_{i_{21}}^{n} Oij$ = Total frequency i = 1, 2, ----- m and

j = 1, 2, ----- n

$R_i = (A_i) = \sum_{j_{21}}^{m} O_{ij}$ = Total observed frequency in the i^{th} row.

$C_j = (B_j) = \sum_{i=1}^{m} O_{ij}$ = Total observed frequency in the j^{th} column.

Under H_o: Two Attributes A and B are independent.

The expected cell frequency for $(i, j)^{th}$ cell is calculated as,

$$E_{ij} = \frac{R_i \, x \, C_j}{N}, \quad \text{for} \quad i = 1, 2, \text{---- } m$$

j = 1, 2, ---- n

Test Procedure

Step 1

The null and alternative Hypotheses are set up.

H_0: Two Attributes A and B are independent (no association)

H_1: Two Attributes A and B are dependent (association)

Step 2

The level of significance α is fixed.

Step 3

The calculated value of test statistic is computed .

$$X^2_{cal} = \sum_{i=1}^{m} \sum_{j=1}^{n} \frac{\left(O_{ij} - E_{ij}\right)^2}{E_{ij}}$$

$$= \sum_{i=1}^{m} \sum_{j=1}^{n} \left(\frac{O_{ij}^{\,2}}{E_{ij}} \right) - N$$

Step 4

The calculated and critical value (table value) of test statistic are compared

$X^2_{critical\,value} = X^2_{(m-1)\,x\,(n-1),\alpha}$

If $X^2_{cal} > X^2_{critical\,value}$ then H_o at α % is rejected.

Step 5

The appropriate conclusion is written

2.9 SCOPE ANDTEMPORAL SCOPE OF THE STUDY

Although the livestock includes a variety of animals the scope of this study is restricted to dairy animals specifically cows and buffaloes. The temporal scope of this study is taken as financial years **2010-11 to 2014-15.** However, wherever possible the data for the year 2015-16 has also been incorporated to make this research up to date.

2.10 LIMITATIONS OF STUDY

Following are the limitations of this study:

While proceeding with this research the researcher has encountered the following limitations.

1. In Indapur Taluka the dairy society which is separately registered for this Taluka only was defunct; therefore the milk of the primary dudh societies in that Taluka is being collected by Katraj Dairy only.
2. The study is limited for the period of 2010-11 to 2014-15.
3. This study is limited mainly to dairy farmers maintaining livestock for dairy Purpose as well as dairy societies..
4. The general limitations applicable to the sample survey method are also applicable to present research work.
5. Hardly a few dairy farmers maintain records of their dairy activity and therefore, the primary data submitted is based on the memory of the dairy farmers.

On account of these limitations, researcher feels that the findings of this work relating to Milk societies in 13 identified Talukas of Pune Districts may or may not be generalized but those can well be regarded as guiding factor. . However, researcher has kept himself away from bias with a view to make analysis subjective.

2.11 CHAPTER SCHEME

Chapter I –Introduction

In this chapter the researcher has covers the introduction of the research topic. This covered India's demographic data, role of agriculture in the context of contribution to Gross Domestic Product, Role of Dairy as a complementary activity

allied to agriculture, the dairy scenario at various level i.e. International, National, State level as well as the district level. It has covered conceptual framework, what is risk, need for managing risks in livestock maintenance, various activities to agriculture, various stake holders in dairy activity, challenges before the Indian dairy, and prospects of dairy activity in general and livestock maintenance in particular, etc.

Chapter II –Research Methodology

This chapter covered the research methodology in which the researcher has brought out the research problem, significance of the research, objectives of the research, justification for the objectives, hypotheses formulated and its justification, research universe, type of research, categories of the respondents, sample selection, identified sample and its justification, collection of data, tools of data collection, data analysis and presentation, statistical tools used, scope of research, limitation of research and chapter scheme adopted.

Chapter III –Review of Literature

In this chapter the researcher has presented the brief reviews of the various types of literature related to the research topic. The researcher has presented the reviews category wise: 1) Previous research, (Ph. D. theses, Research Papers, 2) Reports, 3) Books 4) Journals and Periodicals 5) Newspaper articles, 6) websites. The researcher has also stated in this chapter knowledge gained and the research gap.

Chapter IV –Profile of Pune District and the identified Societies:

In this chapter the researcher has brought out a brief profile of the research universe. This profile helps the reader to understand the observations and the suggestions in right perspective.

Chapter V - Analysis and Interpretation of the Data:

In this chapter the researcher has presented the primary data collected with the use of tables and graphs which helps in understanding the data and its interpretation. The researcher has also substantiated the hypotheses originally framed, using appropriate statistical tool i.e. Annova and Chi-square test.

Chapter VI –Observations, Suggestions / Recommendations & Conclusion

This is the last chapter which deals with the observations made based on the interpretation of the primary data analysis and the suggestions/ recommendation emerged out of it have also been recorded in this chapter. This chapter also covers scope for further research and the conclusion of this thesis.

Bibliography

It gives the details of the books / periodicals / reports / newspapers / websites referred in this research.

Annexure

The questionnaires prepared for the dairy societies, and dairy farmers.

2.12 CHAPTER SUMMARY

In this chapter the researcher has brought out the significance of this research, its objectives and hypotheses, the research methodology used, data collection, its presentation, interpretation, statistical tools used for validation of the hypotheses originally framed, scope and limitations of the research and the chapter scheme adopted for the presentation of the research.

CHAPTER – III
REVIEW OF LITERATURE

3.1 INTRODUCTION

Immediately on finalization of the research topic the first and foremost task taken on hand is to extensively read the various literatures related to the research topic to attain knowledge about the research topic on hand. This reading helps the reader to get himself acquainted with what is the extent of research in this area. This reading also enables the researcher to find any gap in the earlier research so that he can dwell upon that particular area and enrich the research topic. Keeping this objective in mind the researcher carried out exhaustive reading and has presented of the reviews thereof in the foregoing paragraphs.

The reviews have been classified in the following segments:

1) Previous research – a) Ph. D. Thesis
   b) Research papers published in conferences.
2) Reports published.
3) Reference Books
4) Articles in Journals and Periodicals
5) Informative news in News Papers
6) Surfing of websites

3.2 PREVIOUS RESEARCH

a) Ph. D. Thesis

b) Research Papers

1. Dr. Harsev Singh (2009)[16], article titled "Ensuring Quality Assurance at Dairy Farm Level". In this article the author has dealt with the various quality aspects which primarily concerned with the on-farm quality control of raw milk. He

[16] Dr. Harsev Singh (2009)[16], article titled "Ensuring Quality Assurance at Dairy Farm Level". Published in the conference proceedings of National seminar on Food Safety & Quality Issues in Dairy Industry, organized by National Productivity Council, Pp 26-31

has discussed the international quality management system, clean milk production at farm level, contamination and control measures at farm level, animal shed and environment, animal health care, milker and milking routine, storage and transport, etc. He has concluded that raw milk quality control at the village level is a multifaceted task which involves animal nutrition, health care, and environment. All these components are of high importance and it is a vital task to focus on the educating the masses, adopting and implementing the right policies, creation of suitable infrastructure and operation support. He has observed that the onus for good quality milk reaching the consumer is not on the dairy animal owner alone, but also on all the stakeholders in the dairy value chain.

2. Nilofer Shaikh, (2010), research paper titled, "Marketing of Cooperative Products Challenges & Remedies". [17] In this paper, the author has also stressed that the dairy cooperatives are also an important segment of the overall cooperative sector. While discussing the challenges before the marketing of cooperative products which includes milk and its other products, she has enlisted the following challenges:

a) Weak economic base
b) Poor member participation
c) Absence of common brand
d) Uneconomic demand
e) Diluted management
f) Losses and increasing NPAs
g) Corruption and frauds.

She has also discussed the remedies needed to meet these challenges. She has suggested raising share capital, improve the front line shops to attract the prospective buyers, modify the working pattern on business line. Shade away the current working style which is in conformity with the government offices bring out the change in management from the traditional one to a professional one. Inculcate in the members'

[17] Nilofer Shaikh, (2010), research paper titled, "Marketing of Cooperative Products Challenges & Remedies". Published in the national seminar on Cooperative Movement in Globalized Scenario, organized by Dr. D. Y. Patil Center for Management & Research during 29th to 31st March 2010.

the ownership of the unit is with the members and not the govt. and therefore they should participate in its running on sound lines.

3. A. K. Misra and A. R. Sirothia (2013),[18] presented a paper titled, "Present Scenario of Dairy Cattle Breeding in India: Time to Review and Revisit." The authors have stated that increasing milk production has been one of the major goals of India's livestock development policy. India has witnessed white revolution in eighteens and nineties of the last century, which was attributed to increase in milk production contributed largely by crossbred cows. The author has discussed the cattle population Dynamics and growth rate, adoption of crossbreeding and its impact on milk production, unfavourable consequences of crossbreeding under Indian conditions, climate change and its effect on cattle performance. The authors have summarized their findings in their words,

> "Crossbreeding has extensively contributed in enhancing genetic potential of non-descript indigenous cattle in terms of increased milk yield, lactation length, decreased age at first calving and calving intervals. Crossbred cows remained as great contributor to white revolution in India and since last few decades with a population of only 26% of total breedable cows, they are producing about 53% of the total cow milk. Future crossbreeding programmes must be undertaken strictly based on the resource map of the area to ensure its future sustainability. For faster improvement of the indigenous breed currently available technologies such as AI, Embryo transfer, in-vitro embryo production, semen sexing cloning, genomic/marker assisted selection needs to be employed,. In the context to climate change scenario, naturally favoured environment friendly pockets of India are to be established as milk alveoli of the country by diverting resources and genetic pool of high potential exotic and crossbreed cattle".

4. S. Subhash, B. Surendra Nath and Satish Kulkarni, (2013)[19], presented a paper titled, "Human Resource Requirements of Indian Dairy Industry:

[18] A. K. Misra and A. R. Sirothia (2013),[18] presented a paper titled, "Present Scenario of Dairy Cattle Breeding in India: Time to Review and Revisit, published in the souvenir of 41st Dairy Industry Conference & IIDE 2013.pp 31 to 39.

[19] Subhash, B. Surendra Nath and Satish Kulkarni, (2013), presented a paper titled, "Human Resource Requirements of Indian Dairy Industry: An Overview". Published in the souvenir of 41st Dairy Industry

An Overview". The authors reviewed the dairy education in India, its present status, manpower availability and requirements of dairy industry, demand and supply gap in Stock, and strategies to be implemented for development of manpower in dairying. They have concluded that the human resource development in dairy sector calls for a holistic approach amongst policy planners, dairy industry, educational institutions, dairy technologists and other stakeholders. The educational institutions need to play an important role in attracting students, quality teaching and sustained improvement in course curricula to meet the changing needs of dairy industry. They also need to establish diploma level courses for meeting the requirement of about six lakh personnel by 2020. A three tier system of dairy education i.e. Certificate/Vocational Courses, Diploma Courses and Professional graduation and above may be introduced in all the dairy science colleges in India. The dairy industry is also expected to play a major role in expanding human resources in dairying by attracting the qualified personnel and retaining them for competence enhancement, training and skill development,.

5. **Mangesh G. Mankar and P. K. Dixit (2013)** [20] Paper titled, "Dairy farming in drought prone and non-drought prone areas in Maharashtra – an economic perspective". The authors have observed that the cost of milk production was lowest in the crossbred cow milk production and was notably high in the case of local cows. The analysis of milk production functions indicated that value of green fodder and concentrates had positive and significant influence on the milk production for all the three species, across regions and seasons as well. In the Drought Prone area, the total employment generated from the bovine husbandry was about 163 man days per household, the participate rate of males in the total employment was about 42 per cent, while the females had a share of 45 per cent and the children subscribed the rest. By and large, the crossbreds generated the maximum net income and family labour income in the DP area while in the Non Drought Prone area the buffalo generated the highest net income.

Conference & IIDE 2013.pp 31 to 39. , published in the proceedings of 41st Dairy Industry Conference & IIDE 2013.pp 44 -49. .

[20] Mangesh G. Mankar and P. K. Dixit (2013) Paper titled, "Dairy farming in drought prone and non-drought prone areas in Maharashtra – an economic perspective". published in the souvenir of 41st Dairy Industry Conference & IIDE 2013.p 117

6. A. N. Dange, S. R. Ghongade, V. S. Lande, P. G. Kokare, P. Yewale, R. D. Kokane (2013),[21] presented a paper titled, "Changes in climate and its impact on Milk Productions". The authors have observed climate can have a gigantic effect on milk production. Climate change is likely to affect milk production because of the sensitivity of dairy cows to excessive temperature and humidity changes as well as cold climate. It is found that cows, like humans, are sensitive to heat stress and low temperature. As hot and humid climates become more extreme, they threaten the productivity of dairy cows. The measures to be taken to minimize overheating of cows in hot humid condition such as shade, tents, cool water sprays and mainly by watering management during cold condition such as protected housing and high energy diet which can help mitigate milk losses now.

7. Anjali Kumari, Ranjana Sinha, Ritika Guta, P. Manjari, Purnima Singh (2016),[22] in their paper titled "Eco-friendly Dairy Wste management Technologies" have observed that besides 1210.2 million people India inhabits 512.05 million livestock. Bovine population (299.9 million) is a major contributor in this livestock population. This large bovine population is major source of livelihood to small and marginal farmers. Dairying is potentially a large consumer of natural resources and potentially a generator of large amounts of pollutants and waste. The waste production in cattle farming is to tune of 40 kg/day/adult animal. (Handbook of Animal Husbandry, 2013). After discussing the technical aspects the authors have concluded that proper handling of livestock waste warrants its integration with farm management practices to make the farm economically viable, environmental friendly and socially acceptable. Several experiments have proved that judicious use of dung from indigenous cow provide more income than milk. Only there is need for the awareness of good management options and their benefits to the livestock keepers.

[21] A. N. Dange, S. R. Ghongade, V. S. Lande, P. G. Kokare, P. Yewale, R. D. Kokane (2013),[21] presented a paper titled, "Changes in climate and its impact on Milk Productions". published in the souvenir of 41st Dairy Industry Conference & IIDE 2013.p 129

[22] Anjali Kumari, Ranjana Sinha, Ritika Guta, P. Manjari, Purnima Singh (2016), in their paper titled "Eco-friendly Dairy Waste management Technologies" published in Livestock Line, Volume 10, Issue 7, November 2016, pp. 42-45

8. Pragya Bhadauria, Arvind Kumar, Preeti Mamgai and Y. S. Jadoun (2016),[23] article titled, Nutritional Management of Dairy Animals during Transition Period for Prevention of Lameness". The authors have stated that the transition period of a cow involves "transitioning" from a non-lactating state in the pregnancy to a lactating state following parturition ranging from 21 days pre and post calving, is also referred as periparturient period. Transition period in the dairy cows is always associated with a series of nutritional, biochemical, hormonal which leads to majority of the health problems in the dairy cow during this period.

The authors have concluded that feeding management should provide a sufficient and balanced supply of nutrients to the pregnant animal. The supply of the major minerals should be part of the diet formulation. Trace elements and vitamins especially biotin may be added via supplementary or compound feed. A methodical approach should be taken to supplement nutrients as an excess is as undesirable and potentially as costly as deficiency. Therefore, always take care what the diet provides, compare this with recommendations and supplement as necessary.

9. Indu Devi, Kuldeep dudi, S. S. Lathwal (Dec. 2016)[24]**,** article titled, "Cow Comfort and Its Effects on Productivity and Profitability". In this article the authors have discussed in greater details as what care should be taken during the transaction period of the cow, for achieving productivity and profitability. The authors have explained as to what is the transition period in the words, Cow Comfort is a function of the cow's management environment. The cow's management environment influences her ability to practice her natural time budget behaviours. "The environment in which lactating dairy cows spend the majority of their time has considerable influence on productivity, health, milk quality, reproduction, animal well-being, and farm profitability. The authors have given certain points on which points stress needs to be given during animal comfort management. These points are Housing, Ventilation, Feeding and improving animal comfort in and around milking.

---

[23] Pragya Bhadauria, Arvind Kumar, Preeti Mamgai and Y. S. Jadoun (2016),[23] article titled, Nutritional Management of Dairy Animals during Transition Period for Prevention of Lameness", published in Livestock Technology, December 2016, Vol. 6, Issue 7, pp. 14-16.

[24] Indu Devi, Kuldeep dudi, S. S. Lathwal (Dec. 2016), article titled, "Cow Comfort and Its Effects on Productivity and Profitability" published in Livestock Technology, December 2016, Vol. 6, Issue 7, pp. 44-46.

- **Housing:** It provides cow free access to feed and clean water round the clock i.e. eat, drink, and rest whenever and wherever they choose. Floor should be skid resistance, thick and soft to reduce injuries.
- **Ventilation:** The ventilation should be designed to prevent high humidity in winter and heat load in summer. Proper air flow is required across all cows. High open sidewalls and a ridge vent opening and supplement natural ventilation with fans used to increase air flow and exchange.
- **Feeding:** Balance ration is required for different physiological stages of animals. The feed should be provided at least 20 hours a day. The feed should be provided frequently. Feed bunk should be cleaned.
- **Effect on milk quality:** Stress affects the milk quality. Milk fat percent was reduced by approximately 0.2 % at 142% overcrowding as compared to 100%. It is well established fact that cow which lie down for 12-14 hours a day are more productive than those with lower lying times.
- **Cow Hygiene/Cleanliness:** It is an indicator of the characteristics of the environment in which animals are kept. Dirty cow are greater risk of developing intra mammary infection.

The authors have concluded saying that attempts to improve cow comfort are aimed at increasing milk production, improved herd health, reproductive success and animal longevity. Resting and standing time play a major role in cow health and productivity and effects of management on these two variables must be understood. Observing cow behavior can provide clues for evaluating hat changes could be made. Cow comfort improvements achieved through stall modification can provide immense benefits to animal wellbeing, milk production and cow longevity, all other minimizing farmers' frustration and stress.

10. D. Ramasamy,R. Chandrakala, C. Prem Anandh, A. Surendraraj, T. Sivakumar[25] (2014|) article titled, "Community Cattle Care Centre – (CCCC) An Opportunity for Landless Livestock owners". In this article the authors have discussed

[25] D. Ramasamy, R. Chandrakala, C. Prem Anandh, A. Surendraraj, T. Sivakumar[25] (2014|) article titled, "Community Cattle Care Centre – (CCCC) An Opportunity for Landless Livestock owners", published in Dairy Planner, Vol. 10, Issue No.6, February 2014, pp. 4-6.

a new concept for the livestock owned by landless livestock owners. While advocating the cause of CCCC the authors have stated that the aims of CCCC in establishing a platform for varieties of input services which will provide social and economic stability to large number of small, marginal farmers and landless livestock owners and also ensure proper collection, processing and marketing of milk. The authors have explained the components of Community Cattle Care Centre which are briefly stated by this researcher:

1. **Cattle shed:** An efficient management of cattle will not be completed without a well-planned and adequate a well-planned and adequate housing. One should provide comfortable accommodation for the cattle. Small holder dairy farmers cannot afford cement floor to the Animal shed. Hence, CCCC shed with concrete floor is essential to help the farmers to collect the urine. Hygienic maintenance of cattle shed is also an essential task to be taken care of.
2. **Clean Milk production:** Without the production of clean milk, there is no use of maintaining high yielding cows and good feeding practices.
3. **Veterinary Care:** The poor status of animal health and limited attention paid to preventive health care services in rural areas is an important area of concern.
4. **Treatment, De-working and Artificial Insemination:** Artificial insemination is a powerful tool mostly employed for livestock improvement. But artificial insemination is very costly for the small holder dairy farmers. These services can increase the productivity of the animals and increase the income of the farmers.
5. **Biogas production at CCCC- A Green Credentials:** Energy is one of the most important factors to global prosperity. At the cattle care unit several waste like dung and other farm waste are utilized for gobar gas production which is a renewable source of energy which can be used for domestic kitchen purpose which will minimize electricity and LPG consumption.
6. **Fodder Bank –** Fodder banks are valuable crops which support productive farming systems. Community fodder cultivation can ease availability of fodder to the landless farmers.

7. **Chaff cutter:** Precious fodder is wasted if it is not chopped. So Chaff cutter usage has to be popularized. Chaff cutter has to be used not only for the green fodder but also for the paddy straw etc.
8. **Herbal garden:** Aloevera, Curry leaves, Adothoda, adamant creeper etc. are cheap safe herbal medicine which can be used as an alternative to costly allopathic medicines.
9. **Ration shop for the cattle feed:** Availability of feed in the actual price without any intermediaries can help the farmers to reduce the cost of production of the milk. Sole, individual efforts to procure the feed and additives can be minimized by the ration shop set up in cattle care unit.
10. **Dairy farmers:** Through this kind of community farming the self-employment could be improved and the milk producers tend to gain confidence in profitable dairy farming. It empowers dairy farmers on technical skill and knowledge about milk processing and encourages them through profitability.

While concluding the authors have observed that dairying in India offers vast opportunities to uplift our economy and sustain livelihood for the population. Community Cattle Care Centre will serve as the gateway for the second white revolution.

11. Abhilasha Singh, Deepika Tripathi, Srobana Sarakar, Amit Sharma[26] (2017) wrote an article titled, "Feeding Strategies for Livestock During Natural Calamities". While introducing the subject the authors have stated that livestock plays a pivotal role in the natural resource-based livelihood of the vast majority of the population especially in developing countries. Livestock accounts for around 40% of the gross value of the agricultural production globally and this figure is likely to go up. Livestock are certainly the best insurance during vagaries of nature like drought, famine, floods and other natural calamities. The goal of a feeding program during natural calamities is to augment a forage-based diet, because in

[26] Abhilasha Singh, Deepika Tripathi, Srobana Sarakar, Amit Sharma (2017) wrote an article titled, "Feeding Strategies for Livestock During Natural Calamities", published in Livestock Technology, Vol. 6, Issue 10, 7th march 2017, pp. 14-16

drought situations, the majority of dry matter consumed by livestock should come from pasture forage. The bulk of the diet for ruminants available commonly in scarcity as in drought in India consists of fibrous feeds mainly crop residues and dried grasses. A novel feeding system has been evolved in last two decades known as complete feed. Complete feed is a system of feeding concentrates and roughage together in blended form.

The authors have concluded saying that natural calamities especially when they are severe can create a very stressful situation for livestock farming. Being proactive and seeking management strategies to help alleviate as many of the negative impacts of the calamities as possible will help compensate for limited forage supplies. Feeding management during disaster has to be given utmost care to prevent starvation. Technologies applications like concentrate mixture, urea treatment, urea molasses liquid feeding and urea molasses mineral block has the capacity to meet the challenge. Unconventional feeds like waste also have the capacity to mitigate the challenge.

12. Priyanka Lal, Binita Kumari, Priyanka Singh[27] (2017), article titled, "Second White Revolution: Changing Paradigm of Dairying from Subsidiary to Mainstream Occupation". While introducing the topic the authors have stated that since last 15 years India has maintained its first position in the world in milk production. The authors feel that if the current scenario of looking at the dairy activity as an allied activity to agriculture, there is no growth in the productivity per animal. If this approach is not changed, it is likely that India will lose this position. The bottle-necks hindering growth in milk production are:

- Rapidly shrinking and degrading grazing areas resulting in shortage of green fodder.
- Increasing feed prices resulting into use of low-quality feed,
- Lo technology-based system of production in rural areas.

[27] Priyanka Lal,Binita Kumari, Priyanka Singh (2017), article titled, "Second White Revolution: Changing Paradigm of Dairying from Subsidiary to Mainstream Occupation", published in Livestock Technology, Vol. 6, Issue 10, 7th march 2017, p. 18

- ❖ Rise in heat stress among cattle on account of global warming resulting in loss of close to two per cent of total milk production.

Therefore, the need of the hour is to have a second white revolution. In order to actualize the implementation of second white revolution it is crucial that a framework needs to be designed to change the paradigm of dairying from "subsidiary" occupation to 'mainstream" activity. Greater emphasis needs to be on achieving economies of scale and continuous yield improvements. This will call for introduction of high-tech dairying which requires:

- ❖ Mechanization and automation of dairy farms.
- ❖ Sustainable measures to provide better quality feed and fodder through developing technologies that increase productivity of crops in rain-fed areas.
- ❖ Provision of improved seed varieties for fodder cultivation.
- ❖ Maximization of environmental benefits through adoption of green energy measures such as re-utilization and effective disposal of manure.
- ❖ Encouragement in establishment of community-based high herd size farms which would ensure investment in scale-up thus improving dairy management systems.

Following are certain challenges for second white revolution:

- ❖ Low corporate participation in the production sector which could otherwise bring in the innovation and boost milk production.
- ❖ Higher costs of provision of specialized input services such as vaccinations and medicines which overshoot the advantages offered by low-labour costs.

While concluding the authors have emphasized that a second white revolution is achievable through strengthening the supply-driven technologies which are sustainable, scalable and profitable. This would also require development of innovative and implementable production models that are futuristic, and have a long term vision of producing more milk per cow so as to ensure a milk secure India.

13. Prof. M. L. Madan,[28] (2017) "Challenges in Livestock and Poultry Production – Solution with Biotechnology". In his address he has observed, "The important health and production challenge among Live stock, which has received considerable attention but little action, has been given to the problem of cattle numbers and how to feed them and manage optimum productive health within given the resources.

He further stated that , while the major concern in India, so far, has been livestock breeding focuses, other areas for production, health and productivity, such as reproduction, maturity, fertility, calf growth, animal products and product quality, animal welfare, disease occurrence and prevention and reducing environmental impact are only now receiving attention. In all these areas biotechnological approach to addresses the problems is the only viable, achievable and deliverable procedure.

- **Feed, food biotechnology:** The most urgent challenge is not only an assessment of nutritive needs for the present and likely future growth in the livestock and poultry population but also exploit the physiological potential of feed utilization. Therefore, it is expedient to consider all measures that will augment nutrient availability to livestock.
- **Animal health:** The increasing demand for and trade in animals and animal products is fuelling a livestock revolution in developing countries and posting increased health problems, to both animals and man.
- **Climate change:** The effects of climate change, though controversial for livestock, but the consensus is that as a part of ecosystem the productivity and animal performance may be affected following the theory of global warming. To guide the evolution of livestock production systems under the increase of temperature and extreme events, better information is needed regarding biophysical and social vulnerability, and this must be integrated with agriculture and livestock components."

[28] Prof. M. L. Madan, [28](2017) "Challenges in Livestock and Poultry Production – Solution with Biotechnology" XXIII Annual Convention of Indian Society for Veterinary Immunology and biotechnology and National Conference on "Challenges in Livestock and Poultry Production – Solutions with Biotechnology", Key note address, available in Compendium cum Souvenir.

14. Mr. M. L. Naware, (2015),[29] in his research article, "Ten-Animal Dairy Unit: Need of Times, has observed that a farmer maintaining two-animal unit can plan to gradually benefit by raising it to a ten animal unit to generate income almost equal to what a school qualified teacher can get as monthly salary for a job in a nearby town. The economics of such a unit has been worked, assuming that it is managed by a farmer's family having one hectare of land dedicated to fodder cultivation. According to him ten-animal unit will most probably become the necessity of the changing times. A farmer maintaining two-animal herd size so that one of his family members can work full-time on it, while others can look after farming. The author has concluded saying that the farmer will be able to generate surplus during each year of the project after making repayment of loan installments. After repayment of the loan amount after 5 years the surplus generation will be much more since there will be no loan installment burden.

15. Christian Schaper, Birthe Lassen, and Ludwig Theuvsen[30] **(2009),** paper titled, "Risk Management in Milk Production: A Study in Five European Countries" have observed that especially in the dairy market, fluctuating prices as well as production and political risks lead to high uncertainty for farmers. The most important risks those dairy farmers currently perceive are various market risks followed by policy and production risks. They have observed that dairy farmers are conscious of risks but are not extremely risk-averse. They have suggested that through such an integrated risk management system, farmers should first try to acquire an overview of all internal and external risks and potential damage their farms are exposed to. They have further observed that Production risks do not receive much attention from dairy farmers with the exception of Swiss farmers.

[29] Dr. M. L. Naware, (2015), in his research article, "Ten-Animal Dairy Unit: Need of Times,, P. R. Gupta's Dairy India, Seventh Edition, Pp.

[30] Christian Schaper, , Birthe Lassen, and Ludwig Theuvsen[30] (2009), paper titled, "Risk Management in Milk Production: A Study in Five European Countries" presentation at the 113th EAAE Seminar "A resilient European food industry and food chain in a challenging world", China, Crete, Greece, date as in: September 3 - 6, 2009

16. M. Njavro (1), V. Par ,Draženka Pleško,[31] (2008). In their research paper titled, "livestock insurance as a risk management tool on dairy farms" have observed that Insurance is risk management strategy which enables risk transfer from farmer to insurance company. It has a positive effect on income stabilization and consequently could lead to higher level of specialization, credit access and competitiveness. The authors have concluded that the majority of surveyed farmers do not use livestock insurance or use it from time to time. Often the only reason for buying livestock insurance is loan conditions (guarantee). The list of risks covered by insurance policy was perceived as limited especially in the case of diseases and the costs of veterinary services.

17. M. Njavro (1), V. Par, Draženka Pleško[32]**,** (2007). In their research paper titled, "livestock insurance as a risk management tool on dairy farms" have observed that Insurance is risk management strategy which enables risk transfer from farmer to insurance company. It has a positive effect on income stabilization and consequently could lead to higher level of specialization, credit access and competitiveness. The authors have concluded that the majority of surveyed farmers do not use livestock insurance or use it from time to time. Often the only reason for buying livestock insurance is loan conditions (guarantee). The list of risks covered by insurance policy was perceived as limited especially in the case of diseases and the costs of veterinary services.

18. David Jakinda Otieno, Willis Oluoch-Kosura, , Joseph Thuo Karugia, Adam Drucker, Edward Rege[33] (2006), in their paper titled, "Risk Management in Smallholder Cattle Farming: A Hypothetical Insurance Approach in Western Kenya" In developing countries small holder cattle farming is an important strategy for earning livelihood. The authors have concluded that the exotic cattle

[31] M. Njavro (1), V. Par ,Draženka Pleško, (2008). In their research paper titled, "livestock insurance as a risk management tool on dairy farms" Presented at the 26th International Association of Agricultural Economists Conference, Gold Coast, Australia, August 12–18, 2006

[32] M. Njavro (1), V. Par, Draženka Pleško , (2008). In their research paper titled, "livestock insurance as a risk management tool on dairy farms"

[33] David Jakinda Otieno, Willis Oluoch-Kosura, , Joseph Thuo Karugia, Adam Drucker, Edward Rege (2006), in their paper titled, "Risk Management in Smallholder Cattle Farming: A Hypothetical Insurance Approach in Western Kenya", Presented at the 26th International Association of Agricultural Economists Conference, Gold Coast, Australia, August 12–18, 2006

breeds are more vulnerable to disease risks than the indigenous one. Majority of the farmers are inclined to reduce the risk by participating in the cattle insurance scheme. This participation in the insurance scheme will motivate the small farmers to increase the strength of the livestock.

19. Dwaipayan Bardhan, Y. P. S. Dabas, S. K. Tiwari and Avadhesh Kumar[34] (2006), in their paper titled, "An assessment of risk attitude of dairy farmers in Uttarkhand" have stated that the risk attitudes of the dairy farmers were measured by the responses of the farmers to various risk management tools, which were included as scale items. The analysis establishes a refined 22-item scale that can be applied by researchers to measure the risk attitude of dairy farmers in Indian context. The refined scale has high degree of reliability as farmers' responses to the items of scale revealed a communal variation of 85%, which is higher than the minimally acceptable range of 65% to 70%.

The study revealed an overall mild degree of risk aversion among farmers. But a certain degree of risk taking behavior was also seen in regard to certain risk management tools, especially livestock insurance. With the financial structure in Indian agriculture, especially the livestock sector, being in transition, and more and more insurance companies entering the field of livestock insurance, the results of this study could be useful to them in ascertaining the extent to which the farmers are risk averse or risk taker to get a measure of demand for their products. The study established a high degree of risk aversion as revealed by the adoption of such risk management tools like vaccinating the animals, calling a veterinarian, prevention of illness, maintaining hygienic conditions, and feeding adequate concentrates. Hence there is a strong tendency on the part of the farmers to mitigate the production risks at farm level by adapting appropriate measures.

[34] Dwaipayan Bardhan, Y. P. S. Dabas, S. K. Tiwari and Avadhesh Kumar (2006), in their paper titled, "An assessment of risk attitude of dairy farmers in Uttarkhand" paper presented at International Conference in Australia in August 2006.

3.3 BOOKS, JOURNALS & PERIODICALS

1. Niharika Thakur and Parminder Singh (2017)[35], article titled, "Role of ICT in Management of Livestock Farms". In this article the authors have stated that Information Communication Technology (ICT) system tool is a multipurpose and multi-agent system. In the process of dairy production, various sensors and automated machines can control, perform the milking, detect nutrient of feeds, mix feedstuff and feet it to the cows etc. The authors have concluded saying that ICT is also a valuable tool in decreasing administrative costs and early identification of problems at farms. Automation technology is changing the way milk is produced and the benefits are far-reaching; improved profitability, milk quality, lifestyle and animal welfare. It can also provide us with information about the cow that we have not had before, to support decision making. The new automated technologies have the potential to change the way we manage cows. It is important to remember that a technology only tells us what is wrong. It's up to skilled herds people to make a decision on how to react to an alert.

Thus this article exposes us to the utility of the Information Communication Technology in livestock farms to increase its all-round performance.

2. Shakti Ranjan Panigrahy, Sanjiv Kumar, Arpita Mohapatra[36] (2016), article titled, "Cattle Insurance – An Insight for Cattle Owners". In this informative article, the authors have given the background of the dairy status in brief wherein they say that in rural India where over 15-20 per families are landless and about 85 per cent of India's farmers are marginal and small, who collectively own about 75 per cent of the bovine but only 45 per cent of operational land. It highlights the probably employment generation capacity of dairy sector in coming days in spite of many difficulties like increased in feed cost, crunch in labour supply, bottleneck in infrastructure like storage, transportation, processing and many more. Besides climatic variation and market demand fluctuation put a strong blow among the

[35] Niharika Thakur and Parminder Singh (2017)[35], article titled, "Role of ICT in Management of Livestock Farms". Published in Livestock Technology, July 2017 Vol. 7,Issue 02, pp. 18-22

[36] Shakti Ranjan Panigrahy, Sanjiv Kumar, Arpita Mohapatra[36] (2016), article titled, "Cattle Insurance – An Insight for Cattle Owners", published in Livestock Technology, Sept. 2016 Vol. 6,Issue 4, pp. 18-20.

stakeholders in different region of India. That's why Indian farmers and entrepreneur are intermingled with production risk and price risk that ultimately generate financial risk.

The authors have categorized the risk involved:

1. **Production risk** – non availability of inputs for animals, morbidity, cattle mortality and natural calamities like tsunami, earthquakes, drought etc.
2. **Price risk.** Fluctuations in costs of cattle and its products, Further the authors have in brief covered the development in livestock insurance in India. The public insurers provide more than 80 per cent of livestock insurance in India under the four subsidiaries of General Insurance Corporation Ltd.

In addition the authors have discussed the following aspects in livestock Insurance Products:

1. **Sum insured:** Sum insured is the market value of the insured cattle (authorized veterinary or insurance company's authorized person helps to judge the value of animal).
2. **Age group:** Animals of ages between 2-12 years depending on health certificate issued by veterinarian.
3. **Premium Rates:** Non-scheme animals – Cooperative dairies – 4%, Private farmers / Bank finance – 5%, Scheme animals 2.25%.

The article gives operating procedure in livestock insurance. It covers, identification, claim procedure and documents claim.

The article is quite informative and gives practical advice on the livestock insurance available in India.

3. DeLaval: Delaval: Dairy Farming Handbook:[37] (2014), In this handbook, the chapter deals with "Dairy farm business Management". The author has concluded that effect of herd management and decision making requires data records.

[37] DeLaval: Dairy Farming Handbook /Chapter 7,pp

The record keeping shall include both production and financial records, so that the business can be efficiently analyzed.

Production records include

- Milk
- Calving
- Culling rate
- Fat and protein
- **SCC** and bacteria count.
- Heifer
- Use of concentrates
- Labour records, and
- Diseases and health disturbances.

Financial records include

- Cash analysis book
- Statement of debtors and creditors
- Valuations
- Enterprise outputs
- Enterprise variables;
- Labour costs
- Fixed assets
- Machinery costs,
- Cost of capital and
- Subsidies, Grants and tax reliefs.

A dairy farm's overall performance can be measured by using a number of economic ratios. The information for calculating these are taken from the profit and loss account and the balance sheet.

The most common ratios are

- Profitability
- Equity

- Liquidity
- Return on capital
- Sensitivity analysis

As a complement to the complete farm analysis, and to get a better view of the profitability of a particular enterprise, a gross margin analysis can be used. The main revenue and cost items for checking the profitability of a dairy enterprise are as follows (per cow):

1. Value of product milk (sales plus used on farm);
2. Value of culls;
3. Value of replacements;
4. Value of calves (sold and retained);
5. Cost of concentrate food;
6. Cost of other purchased feedstuffs;
7. Other variable costs;
8. Forage variable costs;
9. Labour costs; and
10. Annual building costs

Gross margin = (1+2+4) – (3+5+6+7+8)

In the same book chapter.5 discusses the animal housing. At the very outset the authors state that an important concept in all animal husbandry systems is the concept of animal welfare and the five freedoms. These five freedoms relate to the ideal states of the animal and include:

1. Freedom from hunger and thirst;
2. Freedom from discomfort;
3. Freedom from pain, injury and disease;
4. Freedom to express normal behavior and
5. Freedom from fear and distress.

While concluding this chapter the authors state that the modern dairy cows are under high metabolic stress. Their metabolic rate is so high that they may start experiencing heat stress at 20^0 C. Depending on production level, no effect is

observed on milk yield down to temperatures of -4^0 C in high yielding cows. To ensure good health and the possibility to produce their full potential,, cows have to be kept in systems which try to reduce any additional load.

Ventilation of any dairy housing structure, whether it is a newborn calf shelter or a lactating cow shelter, is of paramount importance. Temperature, relative humidity and air movement around the cows are parameters that are controlled through ventilation. There are different approaches which include mechanical and natural ventilation.

When planning the barn and ventilation system it is important not to forget how to handle the manure and manure gases. Ensure the cross channels are deep enough and that a proper water seal is constructed between the barn and the manure well. A fan has to be installed at the outlet together with local gas evacuation in the case of long and shallow cross channels. At high levels, dust particles can be particularly irritating to the respiratory tract and cause breathing problems and coughing. The ventilation system has to be dimensioned to the type of dairy cattle, number of animals, their weight and distribution in the stall, size of stall and design. Lamps, windows or roof plates are used to ensure there is sufficient light for the cows. Good grounding of all metal parts in the barn such as fences and cubicles, are ensured so the cows are not exposed to leaking current.

4. Dr. Kumar Kore, [38]AB Vista South Asia, (2017), article titled, "Feed Safety – How safe are we?" The author has stated that in today's changing world, safety and security remain basic human needs. Ensuring the safety of food has also been a major focus of international and national food safety authority like FAO (Food and Adulteration Organization) and FSSAI (Food Safety and Standard Authority of India). The author has concluded that animal feed may be contaminated with organic and inorganic compounds as well as residue of pesticide and fungicide may enter food chain through feed raw materials. The effects of feed contaminants and toxins range

[38] Dr. Kumar Kore, AB Vista South Asia, (2017), article titled, "Feed Safety – How safe are we?", published in Think Grain, think feed, monthly magazine for Feed Technology, Volume 3, Issue 3,January 2017, pp 12-14.

from reduced intake to reproductive dysfunction and increased incidence of bacterial diseases. Residues transferred to edible animal products represent another reason for concern. Comprehensive legislation is required in place for the control of several of these chemical compounds, biological contaminants and pathogens in feed.

5. **Prof. (Dr.) R. Nagarcenkar (Chief Editor) (2016)[39],** book titled, "An Introduction to animal Farming Systems in India". Today, animal farming is acknowledged as one of the most important components of the agricultural sector. India predominantly follows a mixed farming system – one in which crop production is combined with the rearing of livestock. The livestock enterprises are complementary to crop production and provide a balanced and productive system of farming. The editor has observed that effective transfer of information of modern technologies to the livestock holders has remained a challenge. The interlocutors and extension workers, themselves being in the rural areas, are often unable to access the latest knowhow. This book has covered in detail the need to have balanced productivity and profitability with environmental concerns and pass on sustainable systems to future generations.

6. **P. K. Naik, R.B. Dhuri, M. Karunakaran, B. K. Swain and N. P. Singh, [40](2013),** article titled, "Hydroponics technology for Green Fodder Production". The word hydroponics has been derived from the Greek word, 'water working'. Hydro means 'water' and phonic means 'working' and it is a technology of growing plants without soil. Fodder is grown inside the green house, where the requirement of plants for water, light, temperature and humidity inside the green house is maintained by water fogging and tube lights, controlled automatically through the sensors of the control unit. To save water, provision for recycling of water is made inside the green house with water tank and pump facility. The authors have observed that a major concern in developing sustainable dairy farming is to make available and feed the animals green fodder economically. The major constraints in

[39] Prof. (Dr.) R. Nagarcenkar (Chief Editor) (2016)[39], book titled, "An Introduction to animal Farming Systems in India".
[40] P. K. Naik, R.B. Dhuri, M. Karunakaran, B. K. Swain and N. P. Singh, (2013), article titled, "Hydroponics technology for Green Fodder Production", Published in Indian Dairy Man, March 2013, pp 54-58.

production of green fodder by dairy farmers are decreasing land holding size, high costs of land, security of water or saline water, more labour requirement for cultivation, requirement of manure and fertilizer, more growth time, non-availability of same quality green fodder round the year, high fencing cost to product from wild animals, influences of natural calamities.

The authors have concluded saying that hydroponics green fodder maize is more nutritious than conventional green fodder maize. As green fodder is an integral part of the dairy ration, it can be grown in situations where fodders cannot be produced successfully. Similarly, progressive modern dairy farmers with elite dairy herd can produce hydroponics green fodder for feeding their dairy animals.

7. Shri Deelip Rath (Chairman NDDB), (2016), [41]while addressing the delegates at the International Dairy Federation, (IDF) World Diary Summit in Rotterdam, the Netherlands held during 17-21 October 2016. Shri Rath explained, " the major challenges for the dairy sector and ways to help nourish a growing population in a sustainable way. He attributed three factors to the phenomenal growth of dairying in India. First, is the creation of a robust and sustainable farmer owned and controlled institutions, which gave market access to small holders and made the small holder system a viable business model,. Second, adoption of policy for breed improvement of various indigenous breeds retaining valuable climate resilient traits of heat tolerance and disease resistance while resulting in higher yields. Third, efficient, use of food by-products and agro industrial residue based balanced feeding system without significant use of resources required for production of human food".

8. Hon. Radha Mohan Singh (26th December 2017):[42] While addressing in the function organized by NDDB's Dairy Excellence Prize distribution the Hon. Minister stated that the first White Revolution was started in three phases. It started in 1970 and was continued upto 1996 when this Operation Flood scheme was closed. Again in 2011-12 National Dairy Scheme was started and in its first phase 14

[41] Shri Deelip Rath (Chairman NDDB), (2016), while addressing the delegates at the International Dairy Federation, (IDF) World Diary Summit in Rotterdam, the Netherlands held during 17-21 October 2016. Available in the Diary November 2016 issue of NDDB's News Magazine.
[42] Natiojnal Dairy Development Board, Diary December 2017 Special Edition, Vol.29 (3)

States were covered and the three states i.e. Uttarakhand, Zarkhand and Chhatisgarh and Telangana states were included. He further stated that Hon. Prime Minister instituted a DIDF – Processing and Infrastructure Development in which a provision of Rs.10,000 crores was made. This was to increase the dairy development processing plant capacity which has been benefited to 50000 villages. This project has envisaged a processing capacity of 140 lakh ltrs of milk. The scheme also envisages provision of employment of 40000 youth.

3.4 NEWS PAPER ARTICLES

1. Dairy Times (Nov. – Dec. 2017), news item titled, "Milk production in India grew by 6.7% in 2015-16; Radha Mohan. The Union Agriculture and Farmers Welfare Minister said that milk production in India grew by 6.7% in 2015-16. The minister said that the government has taken several steps, including Gokul Mission, to increase milk production.

Under this mission for the year 2014-15 to 2016-17, a provision of Rs.500 crore was made. NDDB with the assistance of the World Bank and the central government has taken several measures under National Dairy Scheme Phase I. It includes a genetic improvement among bovines, betterment of rural infrastructure in dairy and to provide better opportunities for milk vendors.

2. Sakal, Tuesday 20th June 2017, [43] **"**Increase in the milk procurement price by Rs.3/- p.ltr." The government of Maharashtra has decided to increase the procurement price of the milk by Rs.3/- per litter. However, this hike will not be passed on to the consumers. This was announced by the Livestock Development, Milk development and fishery minister Mr. Mahadeo Jankar. He further stated that in order to ensure maintenance of uniform rates even for private companies, the government of Maharashtra is to pass appropriate legislation.

[43] Sakal, Tuesday 20th June 2017, **"**Increase in the milk procurement price by Rs.3/- p/ltr."

3. Janshakti Pimpri-Chinchawad,[44] dated 13th July 2017, "Private dairy organizations are grabbing dairy farmers". For the last several years the private dairy owners are grabbing the dairy farmers by paying reduced rates for milk procurement. The Govt. has prescribed Rs.27 per litter for cow milk while the private dairy organizations are paying only Rs.24 per liter and for buffalo milk Rs.33/- per litter. This is entailing loss to the dairy farmers. Many a time the dairy farmers' complaints about the low rate but nobody take cognizance of it. When the demand exceeds the supply these private dairy organization give higher commission to the milk collection centers and procure the milk.

3.5 KNOWLEDGE GAINED

The researcher is a post graduate in the veterinary science and has with him rich experience of managing a large dairy union for over two decades. The researcher through the reading of the recent development could update himself on various facets of dairy farming, particularly the management aspect. The researcher concentrated in studying the management techniques in risk management, and also could gain knowledge of measuring the productivity and profitability of the dairy stakeholders. The researcher is confident that with this added knowledge the researcher's confidence level in pursuing this research work definitely helped him in conducting this research. At all the times the researcher's focus has been that the present study should bring out improvements in the grass root level dairy farmers as well as the village level dairy societies. It is hoped that this insight which he has gained will help in improving the dairy industry and its contribution to India's rural area socio economic development.

3.6 KNOWLEDGE GAP

The review of literature presented herein above has helped the researcher to confirm that the topic of the present research has not been covered by any of the previous researcher. The researcher being a veterinarian and holding a key position in the District Dairy Union is very well conversant with the dairy farming and the problems and prospects associated with the dairy activity in vogue. Therefore, the

[44] Janshakti Pimpri-Chinchawad, dated 13th July 2017, "Private dairy organizations are grabbing dairy farmers".

researcher is of the considered view that there is a knowledge gap so as this research topic is concerned. The researcher is of the view that this research will go a long way in identification of the risk factors and the findings and suggestions will be beneficial for all the stake holders of the dairy activity.

3.7 SUMMARY

In this chapter the researcher has presented the reviews of the various literatures relating to the present research topic. Certainly this has enlightened the researcher as to what is the knowledge gap in this regard. This reading has provided a direction to the current research and the researcher has made very good use of the same.

CHAPTER – IV

PROFILE OF THE STUDY AREA

4.1 INTRODUCTION

In order to have proper understanding of the research observations, suggestions in right perspective, it is useful to have at least a brief profile of the study area as well as the Talukas identified for this research. Keeping this aspect in view in the following pages the researcher has brought out the brief profiles.

Fig. 4.1 : Map of Pune District

The Pune District is located in the State of Maharashtra. Pune metropolitan city is the district head quarter.

4.2 DEMOGRAPHIC SCENARIO

According to the **2011 census** Pune District has a population of 94,26,959, roughly equal to the nation of Benin or the US state of North Carolina. This gives it a ranking of 4th in India (out of a total of 640). The district has a population density of 603 inhabitants per square kilometer (1,560 /sq mi) . Its population growth rate over the decade 2001-2011 was 30.34 %. Pune has a sex ratio of 910 females for every 1000 males, and a literacy rate of 87.19 %.

Population density	461.85 /km^2 (1,196.2 /sq mi)
Literacy	80.78%
Sex ratio	919
Thesils	1. Pune City tehsil, 2. Daund tehsil,
	3. Baramati tehsil, 4. Bhor tehsil,
	5. Indapur tehsil, 6. Velhe tehsil,
	7. Purandar tehsil, 8. Shirur tehsil,
	9. Ambegaon tehsil, 10. Khed tehsil,
	11. Junnar tehsil, 12. Maval tehsil,
	13. Mulshi tehsil, 14. Haveli tehsil

http://www.census2011.co.in/census/district/359-pune.html

Tablel 4.1: Demographic growth of Pune District

Census year →	**1961**	**1971**	**1981**	**1991**	**2001**	**2011**
Rural	1527	1848	2193	2725	3032	3687
% growth	**Base year**	**21.02**	**18.66**	**24.25**	**12.00**	**21.60**
Urban	939	1330	1971	2807	4201	5740
% growth	**Base year**	**41.64**	**48.19**	**42.41**	**49.66**	**36.63**
Total	2467	3178	4164	5533	7233	9427
Growth Rate	**Base year**	**28.82**	**31.02**	**32.87**	**30.72**	**30.33**

Source: District Socio Economic Review of the Pune District for the respective year

Irrigation Facilities in the District

The following data depicts the total cultivable area as well as irrigation facility availability of Pune District

Table 4.2: Growth of Cultivable area and area under irrigation in Pune District

Particulars	Unit	2010	2011	2012	2013	2014
	'000 H					
Total cultivable Land	'000 H	992	992	992	992	992
Total Irrigation	'000 H	320	320	320	320	320
Net Irrigation	'000 H	263	269	263	263	263
Total forest Land	H	1898.70	1898.15	1902.85	1890.00	2023

Source: District Socio Economic Review of the Pune District for the respective year

Infrastructure Development

The development of the district envisages increase in the infrastructural facilities of the district. Hence the researcher has collected the data on the various aspects of infrastructure development during the study period which reveals the following position.

Table 4.3: Growth of Banking facilities in Pune District

Particulars	Unit	2010	2011	2012	2013	2014
Banking & Finance						
Bank branches of the commercial Banks	No.	937	1020	809	926	985
Bank branches of the Pune District Central Coop. Bank.	No.	246	247	247	251	254
Primary Agricultural Coop. Societies	No.	1293	1324	1324	1324	1324

Source: Annual Credit Plan document of respective year for Pune District

Table 4.4: Infrastructure Development in Pune District

Particulars	Unit	2010	2011	2012	2013	2014
Infrastructure Development						
Villages electrified	No.	1845	1820	1864	1866	1866
Post offices	No.	780	781	660	660	660
S.T. Bus Routes in the Dist.	No.	1851		899	903	906

Source: Annual Credit Plan document of respective year for Pune District

Table 4.5: Growth of Veterinary services in Pune District

Particulars	Unit	2010	2011	2012	2013	2014
Veterinary Services						
Veterinary Hospitals	No.	6	6	6	6	6
Veterinary Dispensaries	No.	69	108	110	110	110
Veterinary Primary Health Centres	No.	208	208	208	208	208

Source: Annual Credit Plan document of respective year for Pune District

Provision of the veterinary services in the interior part of the district helps the development of dairy as well as poultry activity which serves as an activity allied to agriculture and supplements the earnings of the agriculturists. The study period has witnessed that there is steady growth of these veterinary facilities in the district which has helped in sound development of the dairy and poultry activity in the district. Pune being a metropolitan centre is a potential market for poultry products and there are number of both broiler and egg producing poultry farms in the district.

Table 4.6: Growth of Heath care facilities in Pune District

Health care:	Unit	2010	2011	2012	2013	2014
Hospitals	No.	48	48	48	48	57
Dispensaries	No.	85	85	90	94	94
Primary Health Centres	No.	85	85	90	94	96
Sub Centres of Primary Health Centres	No.	96	110	122	126	541

Source: Annual Credit Plan document of respective year for Pune District

Table 4.7: Growth of Roads Transport & Communication in Pune District

Particulars	Unit	2010	2011	2012	2013	2014
Roads						
Railway line	Kms.	311	311	311	311	311
National highways	Kms.	456	456	505	461	461
State Highways	Kms.	1325	1325	1325	2201	1992
Main district roads	Kms.	2950	2950	2960	4135	4079
Other dist. roads.	Kms.	2553	2583	2584	2367	2367
Rural Roads	Kms.	6698	6698	6812	10078	10078
Villages connected by road	No.	1774	1774	1774	1774	1851

Source: Annual Credit Plan document of respective year for Pune District

Rivers and Lakes and Dams

Major rivers of the district are: Pushpavati, Krushnavati, Kukadi, Meena, Ghod, Bhima, Bhama, Andhra, Indryani, Pavna, Mula, Mutha, Ambi, Mose, Shivganga, Kanandi, Gunjavni, Velvandi, Neera, Karha etc.

4.3 SOME MAJOR DAMS ARE

Yedgaon (Kukadi), Pimpalgaon (Pushpavati), Manikdoh, Meena (Meena), Dimbe (Ghod), Chas-Kaman and Ujani (Bhima), Andhra (Andhra), Valvhan (Indrayani), Pavna (Pavna), Mulshi (Mula), Temghar, Khadakwasla (Mutha), Varasgaon (Ambi), Panshet (Mose), Chapet (Kanandi), Bhatgar (Velvandi), Devghar, Veer (Neera)

Lonavla region (Wadgaon-Maval Taluka) In this region there are number of lakes. To name a few Bhushi, The Lonavala lake, Valvahan, Tungarli etc. These are the tourists centres. Especially the younger generation from the nearby urban/ metropolitan cities crowds these centres on weekends

Table 4.8: Land Utilization (Thousand Ha)

Total Area Reported	1562
Forest Land	172
Area Not available for cultivation	64
Permanent Pasture and Grazing land	66
Land under Miscellaneous tree Crops	26
Cultivable Wasteland	33
Current Fallow	62
Other follow	67
Net Sown Area	992
Total or Gross Cropped Area	1173
Area Cultivated more than once	181
Cropping Intensity (GCA/NSA)	118
Area under Irrigation	294

Source: Annual Credit Plan 2013-14 under Lead Bank Scheme

Table 4.9 : Rainfall & Ground Water

Rainfall (in mm)	Normal	Actual	2009-10	2010-11	2011-12
	680		973	1037	955
	Variation from Normal		193	357	275
	Net annual recharge		Net annual draft		Balance
Availability of ground water (Ham)	136836.77		30052.22		106784.55

Source: Annual Credit Plan 2013-14 under Lead Bank Scheme

Table 4.10: Irrigation Coverage (Ha)

Total Area Available for Irrigation (NIA + allow)	1172952
Irrigation Potential created	NA
Net Irrigated Area (Total area irrigated at least once)	269901
Area irrigated by canals / channels	124358
Area irrigated by wells	145543
Area irrigated by tanks	NA
Area irrigated by other sources	NA
Irrigation potential utilized (Gross Irrigated Area)	319995

Source: Annual Credit Plan 2013-14 under Lead Bank Scheme

4.4 AGRICULTURE AND CROPPING PATTERN

Agriculture is the main land use in all talukas except Pune where the area not available for cultivation constitutes the major land use category covering about 60% of the total area. The western talukas of Velhe, Mulshi and Mawal have more forest cover than the other talukas.

Cereals dominate the crops in all Talukasexcept Bhor, Velhe, Mulshi and Mawal.

The eastern part of Pune district has more area under cultivation than the western part. Large patches under Kharif crops have been delineated in Baramati, Shirur and Junner tahsils. Availability of good irrigation facilities in the area has enabled widespread practice of double cropping along the Nira river forming the

Southern boundary of the district, as well as along the Bhima, Mula and Indrayani rivers.

The bovine population is highest in Khed (1,17,782) followed by Junner (95,547) and is lowest in Pune (12,859). The cattle population is the highest in Baramati tahsil with 1,93,844 cattle, closely followed by Indapur, with 1,90,891 cattle and the lowest in Pune with only 24,353 heads of cattle.

Table 4.11: Major crops and cash crops are cultivated in Pune district.

Types	Names	Cropping Period in Months	Market (District, State, Export)
Major Crops (Irrigated)	Ground nut, Tur, Soya, Corn Wheat, gram	June-July	District and State
Major Crops (Non - Irrigated)	Kharif--Bajra, Tur, Mug, Udid, Sunflower Rabi----Jowar	June -July Sept- Oct	District and State
Major Cash Crops	Sugarcane	June-July Sept-Oct. Jan-Feb	District(sugar factories)
Major Plantations	Mango, Chickoo, Pomegranate, Anjir, citrus fruits Rose flowers, Shevanti etc.	June- July Throughout the year	District, State and Exports

4.5 ECONOMY OF PUNE CITY

Pune is the district head quarter and the metropolitan city. The brief economy of is covered here. Pune has a booming economy. There are two industrial estates in the outskirts of Pune developed by the Maharashtra Industrial Development Corporation (MIDC). This is besides the already bustling industrial hub of Pimpri-Chinchwad. A large number of Indian industry majors and MNC's have set up base in Pune and its suburbs. These include companies like Bajaj Auto, TELCO, Philips India, Kirloskar Cummins, Kalyani Sharp, Bharat Forge, Mahindra And Mahindra, Hindustan Antibiotics, Mercedes Benz India Ltd, Weikfield India, Serum India, Duro Shocks, Kinetic Honda, Whirlpool, LG, Frito Lay, Coca Cola etc. Suburbs of Pune

like Baramati, Khed, Mundhwa, Loni, Yerwada, Talegaon, Alandi, Warje, Wadgaon etc. account for a majority of Pune's agricultural produce, though Pune is not an agricultural city. Pune has also emerged as a software industry hub. Many of the leading Indian software companies have their presence in Pune. These include companies like Infosys, Tech Mahindra, Wipro, Patni, Satyam, Persistent Systems, Geometric Software Solutions Private Limited and others besides many global players. The BPO industry is also booming with many leading Indian names and MNC's registering their presence in Pune.

Table 4.12: Deposits Outstanding (Rs. In Lakhs)

Agency	31.3.2010	31.3.2015	31.3.2016	31.3.2017
Commercial Banks	5160302	13723489	15012189	18398727
Regional Rural Bank	NA	8126	7030	10107
Cooperative Banks	491174	694358	702452	752889
All Agencies	**6511476**	**14425973**	**15721672**	**19161723**

Source: Annual Credit Plan of respective years, under Lead Bank Scheme

- ❖ Pune is also famous for Ganesh Festival
- ❖ Osho Ashram: This is the famous institute of Rajneesh, the guru of Meditation. The institute is located at 17, Koregaon Park and spread over a huge area.
- ❖ Shaniwar Wada: The historic palace built by Bajirao Peshwa.
- ❖ Shind Chhatri: An architectural excellence, this is a memorial built and dedicated to Mahadji Shinde. It is located at a small distance from the racecourse in Pune.
- ❖ Pataleshwar Cave Temples: This temple is carved out of a single stone. It is located in the heart of the city.

4.6 SOCIO-ECONOMIC DEVELOPMENT OF PUNE DISTRICT

The researcher has brought out here under the socio economic development of Pune district during the study period, focusing on certain vital statistics at the

beginning of the study and at the completion of the study period. The researcher has also provided at the end of this chapter latest position obtained in this regard. The position obtained in the identified Talukas for this study has been highlighted.

4.7 MAJOR DAIRIES IN PUNE DISTRICT

The following tables show the dairies in organized sector supplying milk in Pune district (including the Pune Metropolitan city)

Table 4.13: Dairies in Pune District in the cooperative Sector

Position as on 31.3.2017

Sr. No.	Name of the Dairy	Located in	Estimated milk supply ltrs.
1	Pune Zilha Sahakari Dudh Utpadak Sangh Katraj dairy	Katraj Pune	1.15 lakh lit/day
2	Baramati Taluka Sahakari Dudh Utpadak Sangh	Baramati	25 Thousand lit/Day
3	Indapur Sahakari Dudh Utpadak Sangh	Indapur	Currently it is defunct.

Source: Office of the Registrar of Coop. Societies, in Pune District.

Table 4.14: Dairies in Pune District in the Private Sector

Position as on 31.3.2017

Sr. No.	Name of the Dairy	Located in	Estimated milk supply in ltrs/day.
1	Suyog Dairy	Nirgudsar Manchar	30,000
2	Sharma Dairy	Loni Ambegaon	10,000
3	Urja Dairy	Shirur	10,000
4	Rahi Dairy	Pargaon Tal. Daund	08,000
5	Anand Dairy	Kiwai Tal. Bhor	08,000
6	Sonai Dairy	Indapur	30,000
7	Agarwal Dairy	Kikawi Tal. Bhor	05,000
8	Parag Dairy	Manchar Tal. Ambegaon	10,00,000
9	Dynamix Dairy	Baramati	10,00,000

Source: Office of the Registrar of Coop. Societies, in Pune District.

The dairies in the private sector are also collecting the milk and supplying in Pune district in a big way. This trend is growing and new dairies are also coming up in the district.

Table 4.15 : Names of the dairies from out of Pune District which supply milk to Pune metropolitan city Position as on 31.3.2017

Sr. No.	Name of the Dairy	Located in	Estimated milk supply ltrs/day
1	Govind Dairy	Phaltan, Satara	50,000
2	Rajaram Bapu Sahakari Dudh Utpadak Sangh	Islampur, Sangli	32,000
3	B. G. Chitale	Bhilwadi Sangli	4,00,000
4	Kolhapur Sahakari Dudh Utpadak Sangh	Shirgaon Kolhapur	2,25,000
5	S. R. Thorat (Gagangiri)	Ahmednagar	35,000
6	Rajhans Sangmner Sahakari Dudh Utpadak Sangh	Sangamner, Ahmednagar	32,000

Source: Data collected from the respective dairy organization.

4.8 BRIEF PROFILE OF PUNE DISTRICT MILK PRODUCERS UNION

Pune District milk Producers Union Ltd. is a cooperative venture established in the year 1960. The union collects the milk from the rural area of Pune district through which the poor farmers are able to pursue dairy as economic activity allied to agriculture and it provides employment opportunity to a number of dairy farmers in the district. The milk collected is processed and sold in bags to the consumers from Pune Metropolitan city and Pimpri Chinchwad area. The union is selling about one lakh fifty thousand litters of mil and various products from milk and through this Katraj dairy has reached in every household of these two twin cities.

The dairy has received ISO 22000:2005 certification.

Table 4.16: Performance of Pune Zillha Sahakari Dudh Utpadak Sangh Maryadit Katraj Pune 411046

As at the end of 31st March every year

Sr. No.	Particulars	2011	2012	2013	2014	2015	2016	2017
1	Milk procured '000 omitted	5,14.53	5,56.38	6,35,15	6.15,65	6,26,24	7,49.07	8,11.16
2	Sale of milk Rs. In Crores	104.31	128.52	144.34	162.99	184.96	203.89	242.48
3	Net profit Rs. In crores	0.13	1.15	1.19	0.17	1.35	2.69	3.45
4	Dividend earned Rs. in lakhs	26.24	26.18	14.76	2.56	15.27	3.80	28.19

Source: Pune Zillha Sahakari Dudh Utpadak Sangh Maryadit Katraj Pune, annual report of the respective year.

It can be seen from the table 4.16 above data that there is fair increase in the milk procurement. Considering 2011 as the base year, the procurement in 2017 increased by 57.74 per cent. Consequently, during the same period the sale of milk in terms of Rs. Increased by 37 per cent. Net profit also increased by 2553.84 per cent.

Pune Zillha Sahakari Dudh Utpadak Sangh Maryadit Katraj Pune 411046

Table 4.17: Average Milk Collection in Lakhs of Ltrs

2009-10	2010-11	2011-12	2013-13	2013-14	2014-15	2015-16	2016-17
1.54	1.41	1.52	1.69	1.67	1.70	2.02	2.28

Source: Pune Zillha Sahakari Dudh Utpadak Sangh Maryadit Katraj Pune, annual report of the respective year.

It is seen from the above data that the average milk collection has recorded increase over the past 7 years.

Pune Zillha Sahakari Dudh Utpadak Sangh Maryadit Katraj Pune 411046

Table: 4.18 : Gross Profit Rs. In lakhs

09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17
1476	1533	1790	2223	1976	2340	3007	2951

Source: Pune Zillha Sahakari Dudh Utpadak Sangh Maryadit Katraj Pune, annual report of the respective year.

The gross profit has shown marginal ups and down during the period 2009-10 to 2016-17. However, during the period 13-14 the G.P. has shown substantially increased. Between 15-16 and 16-17 the GP has marginally decreased.

Pune Zillha Sahakari Dudh Utpadak Sangh Maryadit Katraj Pune 411046

Table 4.19: Net Profit Rs. In lakhs

09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17
217.5	13.38	378	119	16	135	269	236

Source: Pune Zillha Sahakari Dudh Utpadak Sangh Maryadit Katraj Pune, annual report of the respective year.

The above data reveals that during the year 2013-14 the net profit was drastically declined due to substantial increase in the employees expenses from Rs.13.63 to 15.08 crores.

4.9 SUMMARY

In this chapter the researcher has given a brief introduction of the Study Area i.e. Pune District. The thrust of the introduction is on the research topic related aspects. The researcher has provided statistical data over a period of time i.e. for the period 2010 to 2014 from the Pune District Economic Survey published by the Pune District Statistical Office. This is the latest available on the website of the District authorities. This enables the reader to compare the growth in various aspects. This brief introduction enables the reader to see the future presentation, more particularly the observations and suggestions in right perspective.

CHAPTER –V

DATA ANALYSIS AND INTERPRETATION

5.1 INTRODUCTION

As stated in the chapter II on Research Methodology, the researcher has collected primary data from two sources – 1) from the dairy farmers and 2) the village milk societies. This data has been presented in this chapter using table formats as well as graphical presentation. This makes the data comprehendible and easy for grasping. Before concluding this chapter the researcher has presented the outcome of the statistical test employed together with the statistical calculations involved in it for the validation of hypotheses which clearly indicates that the hypotheses formulated at the beginning of this research have been fully tested.

5.2 DATA FROM THE DAIRY FARMERS

In the first place personal information of the farmer which has a bearing on the attainment of the objectives has been presented in the following paragraphs:

1. Educational Qualifications

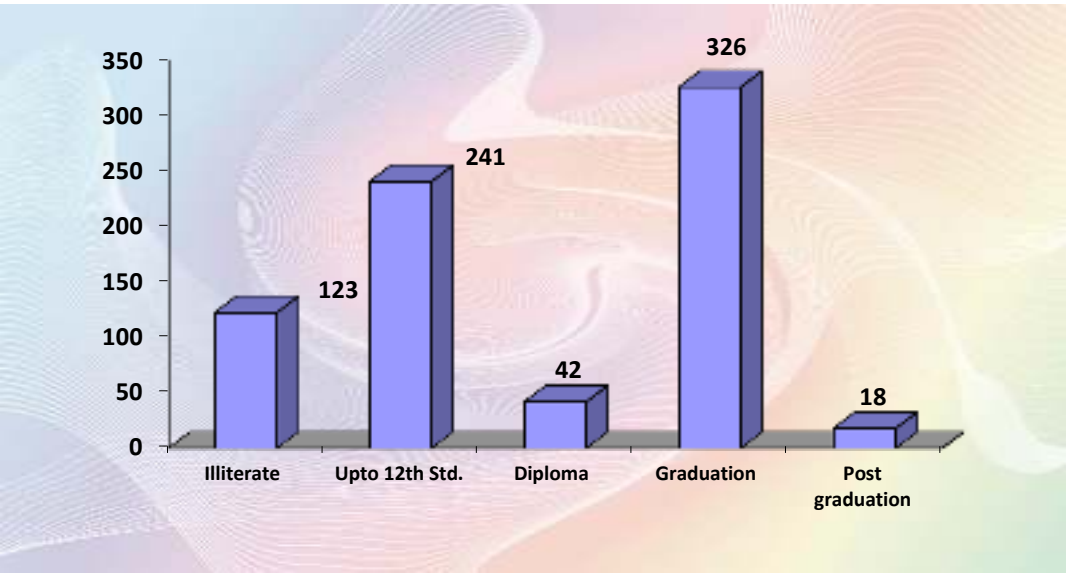
Educational qualifications have a bearing on the maintenance of the livestock. An educated farmer can certainly read, interact with the veterinarian in detail and grasp in what manner he should raise the livestock. This need not mean that one should be a graduate but bear minimum educational qualification is advantageous. This is why this data has been collected and presented hereunder:

Table 5.1: Data relating to educational qualifications of the identified dairy farmers

Illiterate	Upto 12th Std.	Diploma	Graduation	Post-Graduation	Total
123	241	42	326	18	750

Source: Field survey data collected

Fig. 5.1: Data relating to educational qualifications of the identified dairy farmers



Interpretation

It can be seen from table 5.1 that 16.4% of the respondents are illiterate while 32.13% respondents have studied upto 12th Std. 5.6% are diploma holders while 43.46% are graduates. 2.4% are post graduates. It means fair number of respondents is educated.

2. Occupation

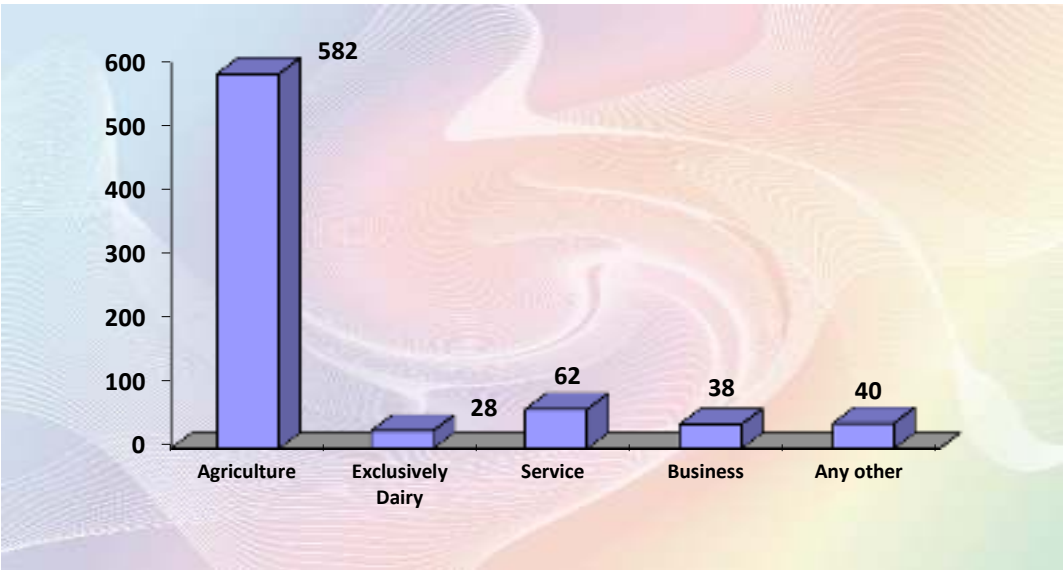
The occupation of the dairy farmer has a bearing on the maintenance of livestock. If the dairy farmer is solely having the dairy as a sole economic activity, naturally he will be concentrating more on the activity. As against this, if it is an activity allied to agriculture i.e. the principal economic activity is cultivation of agricultural lands and the dairy is an allied activity naturally the main concentration will be on the crop maintenance. So also if the occupation is agricultural labour then his approach in maintenance of the livestock is different. Therefore, information of the dairy farmer's occupation has been obtained and presented hereunder:

Table 5.2 : Occupation wise classification of the identified dairy farmers

Agriculture	Exclusively Dairy	Service	Business	Any other (vendors)	Total
582	28	62	38	40	**750**

Source: Field survey data collected

Fig. 5.2: Occupation wise classification of the identified dairy farmers



Interpretation

It is revealed that 77.6% of the respondents are agriculturists and they are pursuing dairy as an allied activity. 5.73% dairy farmers are exclusively pursuing dairy activity. 8.26% are in service, 5.06% are businessmen and 5.33% are vendors of various commodities. Thus it can be seen that a vast majority of the respondents are pursuing dairy as an activity allied to agriculture or to any other economic activity.

3. Land holding wise classification of the identified dairy farmers

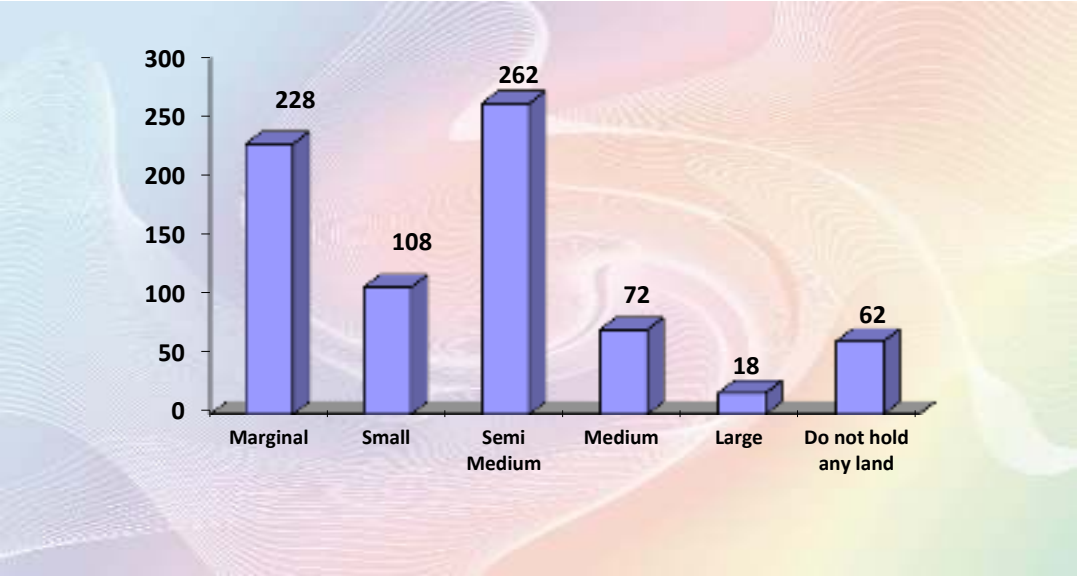
For the purpose of classification of the dairy farmers on the basis of the land holding, the criteria prescribed by the NABARD have been used. In order to understand whether there is any bearing of the landholding wise classification of the identified farmers on the dairy activity can be traced only when we have the data about the classification of respondents whether he/she is a marginal farmer, small farmer, semi medium or large farmer or whether one is a landless labour. A large farmer may have large livestock holding. It is for this purpose the data is useful.

Table 5.3: Land holding wise classification of the identified dairy farmers

Marginal	Small	Semi Medium	Medium	Large	Do not hold any land	**Total**
Land holding less than 1 Ha	Higher than 1 Ha but less than 2 Ha.	Higher than 2 Ha but less than 4 Ha	Higher than 4 Ha but less than 10 Ha	Over 10 Ha.		
228	108	262	72	18	62	**750**

Source: Field survey data collected

Fig. 5.3: Land holding wise classification of the identified dairy farmers



Interpretation

The data reveals, 30.4% respondents are from marginal farmers' category and 14.4% are from small farmers' category. 34.33% of the farmers are holding higher than 2 Ha but less than 4 Ha of land. The number of large farmers is just 2.4% while 8.27% are not holding any agricultural land.

4. Membership of the village dairy society

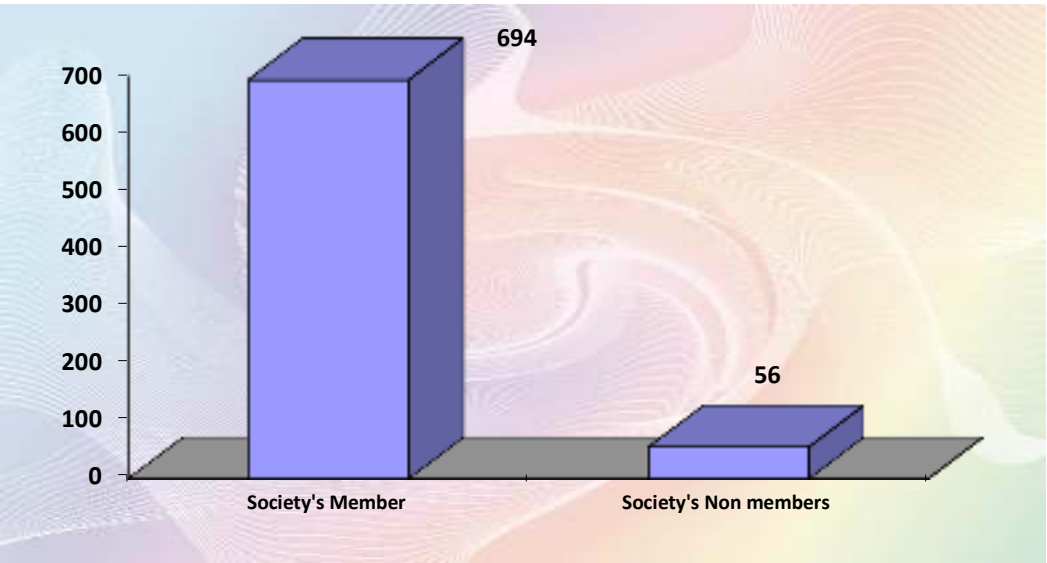
In the villages although it is expected that every dairy farmer should be a member of the village dairy society, in reality there are some dairy farmers, for the reasons best known to them, do not seek membership of the dairy society but still supply their milk to the dairy union directly. Therefore, the researcher thought it appropriate to know the respondent dairy farmer's status as a member of the society or otherwise.

Table 5.4: Identified dairy farmers' status relating to the dairy society's membership

Member of the dairy society	Nonmember of the dairy society	Total dairy farmers
694	56	750

Source: Field survey data collected

Fig.5.4: Identified dairy farmers' status relating to the dairy society's membership



Interpretation

92.53% of the respondents are the members of the dairy society while hardly 7.47% are the nonmembers. Only in exceptional case dairy farmers do not become member of the society.

5. Experience as a dairy farmer

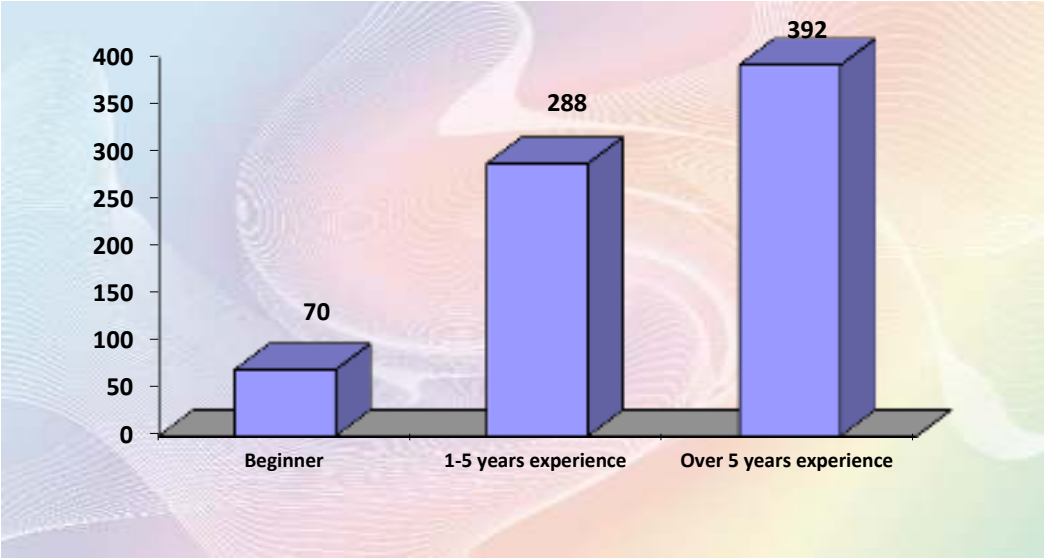
Experience of maintaining the livestock is also an important factor which has a bearing on the maintenance of the livestock. If he/she is experienced naturally because of their experience the maintenance will be of high order. A beginner will have relatively low order maintenance. This is why this data is collected and presented in table 5.5 and figure 5.5.

Table 5.5: Dairy maintenance experience wise classification of the dairy farmers

Beginner	Experience between 1 to 5 years	Over 5 years	Total
70	288	392	**750**

Source: Field survey data collected

Fig 5.5: Dairy maintenance experience wise classification of the dairy farmers



Interpretation

Hardly 9.33% of the respondents are beginners in the dairy activity while those who have experience of dairy activity of 1 to 5 years' experience account for 38.4%. Those who have over 5 years' experience of dairy farming are 52.26%. It means a vast majority of the respondents are having fair experience of maintaining livestock.

6. Types of dairy animal maintained

There are various types of dairy animals being maintained by the dairy farmers. The dairy collects both cattle milk as well as buffalo milk separately and hence separate data is also presented. Therefore, this being vital data information is collected and presented in the table 5.6.

Table 5.6: Type of dairy animals (cattle) maintained by the identified dairy farmers

Non-Descript		Crossbreed cows						Pure Deshi (Indigenous) Cows					
No.	Milk LPD	H.F.		Jersey		Other		Khilar		Gir		Other	
		No.	Milk LPD	No.	Milk LPD	No.	Milk LPD	No.	Milk LPD	No.	Milk LPD	No.	Milk LPD
182	1405	1729	11368	1099	6509	-	-	96	59.5	12	89	113	278

Source: Field survey data collected

Interpretation

In Pune district majority of the milk collected is that of cows – mainly HF cows. This breed is acclimatized to this area. Similarly, the type of dairy animals (buffaloes) maintained by the selected respondents is presented in table 5.7.

Table 5.7: Type of dairy animals (Buffaloes) maintained by the identified dairy farmers

Non-Descript		**Buffaloes**					
No.	**Milk LPD**	**Murrah**		**Pandharpuri**		**Other**	
		No.	**Milk LPD**	**No.**	**Milk LPD**	**No.**	**Milk LPD**
62	531	115	473	78	100	116	325.5

Source: Field survey data collected

Interpretation

The statistics in table 5.7 reveals that in the study area the number of non-descript buffaloes are more and their average per day milk is 4 ltrs. Next in order comes Murrah which accounts for 120 buffaloes where the per day production average is 6 ltrs. Pandharpur buffaloes are 67 and their average milk production per day is 4.5 ltrs.

7. a) Type of housing arrangements for the livestock

The housing arrangements for the livestock are also of vital importance. The housing should be clean, airy and pleasant. This has bearing on the milk production and health of the livestock. In order to understand the situation at the identified dairy farmers the following data is collected and presented, table 5.8.

Table 5.8: Classification of the housing arrangement for the livestock

Brick work	RCC structure	Temporary bamboo structure	**Total**
530	148	72	**750**

Source: Field survey data collected

b) Mode of housing the livestock

Broadly there are three modes of housing for the livestock. Those are: Free housing, tail to tail and head to head. In every mode there are certain advantages. E.g. In the open mode raring the cost of labour is not there, because of the exercise the milk production is also increased. Therefore this data is also vital to understand the dairy activity, and depicted in table 5.9.

Table 5.9: Mode of housing wise classification of the identified dairy farmers

Free Housing System	All having one side head	Tail to Tail	Head to head	**Total**
32	608	38	72	**750**

Source: Field survey data collected

Interpretation

81.06% of the respondents follow housing of the dairy animals with one side head system, while 4.26% of the respondents follow free housing system. 5.06% follow tail to tail while 9.6% follow head to head system. Majority of the respondents follow the traditional system of one side head system as usually they have lengthwise higher housing accommodation.

8. Availability of water source

Availability of potable water for the livestock is also an important aspect and it has a bearing on the milk yield also. If adequate water is available naturally it will help the dairy farmer to maintain cleanliness in the livestock house as well as in maintaining the livestock free of waterborne diseases and ensure healthy condition. Therefore, such data has been collected and presented in the table 5.10.

Table 5.10: Data relating to availability of water source at identified dairy farmer's place

Dug well	**Irrigation outlet**	**Village water scheme**	**Total**
264	366	120	**750**

Source: Field survey data collected

Interpretation

35.2% of the respondents have dug well, 48.8% have irrigation outlet as their water source. Hardly 16% of the respondents are dependent on the village water scheme for their water requirement.

9. Annual family income of the dairy farmer

The dairy activity is by and large undertaken as an activity allied to agriculture. Therefore, the data has been collected differently for the agriculture as well as for the dairy activity. One can also get a robust idea as to whether the dairy farmer maintains accounts for the economic activities undertaken. If the family income is sound naturally there is every possibility that the maintenance of the livestock will be of good order. It also, focuses light on whether the dairy farmer resorts to ploughing back of profits. i.e. whether at least part of the surplus generated is being invested in improving the infrastructure or in buying the livestock afresh etc.

Table 5.11: Annual Family income wise (with source) classification of the identified dairy farmers

	Less than Rs.1 lakh.	Rs.1 lakh to Rs. 5 lakhs	Over Rs.5 lakhs to Rs.10 lakhs	Over Rs.10 lakhs	Total
Agriculture	388	282	65	15	750
Dairy activity	382	312	38	18	750
Any other activity service/ Trading / Vendors of various items	0	92	27	6	125

Source: Field survey data collected

Interpretation

The data in table 5.11 points out that 51.73% of the respondents have less than agriculture income and 50.93% have income from dairy activity less than Rs.1 lakh. 37.6% of the respondents have agriculture income between Rs.1 to 5 lakhs while 41.6% of the dairy farmers have reported that their income from the dairy activity is in between Rs.1 to Rs.5 lakhs. Respondents having agriculture income between Rs.5 to 10 lakhs account for 8.66% while same the income criteria reveals 3.6% of them get this income range.

10. Mode of payment of the milk supplied

It is also appropriate to know how the sale proceeds of the milk supplied are received by the dairy farmer. There are different practices and hence it was considered to know the present prevailing situation.

Table 5.12: Mode of Payment of Sale Proceeds and its frequency to the identified dairy farmers

	In cash	By cheque	By credit to bank account	Is there any system of advance payment
Mode	332	0	418	Yes / No. 0 / 750
Frequency	Weekly	Fortnightly	Monthly	
	0	620	130	

Source: Field survey data collected

Interpretation

From table 5.12 it is observed that 44.26% of the respondents get cash payment while 55.74% respondents stated that they get payment of the sale proceeds of the milk supplied to the dairy by credit to their bank account. 82.66% of the respondents get the payment of the sale proceeds fortnightly and they supply the milk to the dairy society which gets their payments from the District Dudh Union every fortnight. The balance 17.33% of the respondents gets monthly payment as they supply the milk to individual families or hotels etc.

Presentation of the data and its interpretation of the statements relating to the validation of the hypotheses and the objectives

In addition to these personal information, the researcher has also sought the choices of the identified dairy farmers on certain statements relating to the maintenance of the livestock as well as the dairy activity as such. For this purpose the identified dairy farmers were provided 5 options on the likert scale and the data has been collected.

While formulating the statements, the researcher has kept in mind the objectives of this research as well as the hypotheses formulated. The data so collected has been used in undertaking validation of the hypotheses using a statistical tool

which has been described in the chapter II i.e. Research Methodology: This facilitates understanding the data in its right perspective.

This data is presented hereunder using the following style:

1) Statement made
2) Rationale for this data
3) Tabular presentation
4) Graphical Presentation
5) Interpretation

By using the following data the researcher has proved the following hypothesis and the objective number 1.

H_1 Dairy activity as an allied activity to agriculture significantly contributes to the rural economy and Objective – 1.

Statement 1: "My dairy activity has over the years helped me to step up my income level"

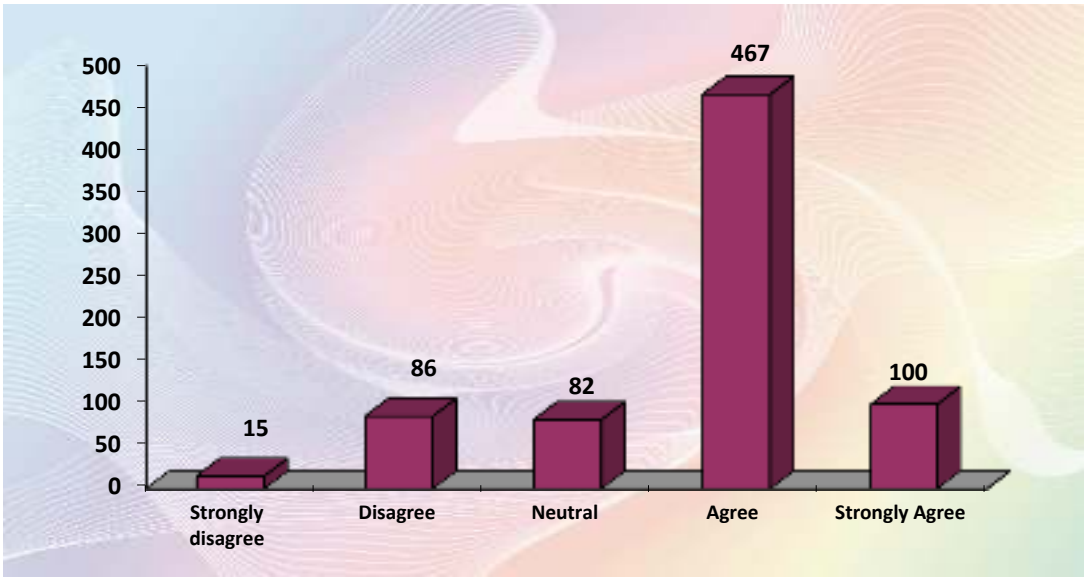
Rationale: If a dairy farmer is undertaking dairy activity for a longer period it is expected that he is running the activity profitably. If he is resorting to ploughing back of profits, naturally the income generation from the dairy activity will show an increasing trend which ultimately helps him to improve positively his life style. The researcher felt it necessary to understand the outcome of the dairy activity over the years and its relation with the increased income. Hence this statement has been presented in table 5.13.

Table 5.13: Response to the statement "My dairy activity has over the years helped me to step up my income level"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	15	86	82	467	100	750
Percentage	2	11.47	10.93	62.27	13.33	100

Source: Field survey data collected

Fig. 5.6: Response to the statement "My dairy activity has over the years helped me to step up my income level"



The total percentage of respondents who either agreed or strongly agreed is 75.6 %. 10.93% have preferred to be neutral while 13.47% of the respondents either disagreed or strongly disagreed with the statement that the dairy activity has helped them to increase their income level.

Statement 2: "Apart from my domestic milk requirement I earn sizable income from dairy activity."

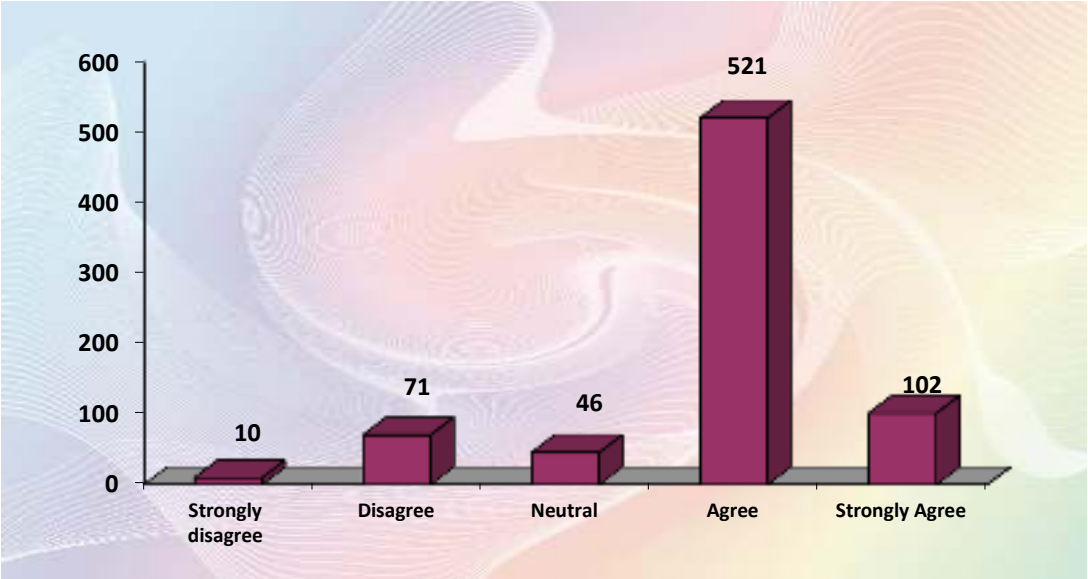
Rationale: Whenever an agriculturist or even landless labour pursues dairy activity, it is but natural that from out of the milk produced he will take out part of it for his family consumption. Whatever surplus milk is there, it is then sent to the dairy or to the actual consumer. There may be some agriculturists who are producing milk for their captive consumption only. This grass root level position has been ascertained from the table 5.14.

Table 5.14 : Response to the statement "Apart from my domestic milk requirement I earn sizable income from dairy activity."

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	10	71	46	521	102	750
Percentage	1.33	9.47	6.13	69.47	13.60	100

Source: Field survey data collected

Fig. 5.7 : "Apart from my domestic milk requirement I earn sizable income from dairy activity."



83.07% of the respondents have stated that apart from satisfying their own consumption needs of the milk, the surplus milk sold also fetches them sizable income. Hardly 10.8% of the respondents have replied negatively.

Statement 3: "My dairy activity fetches adequate FYM for agricultural operations"

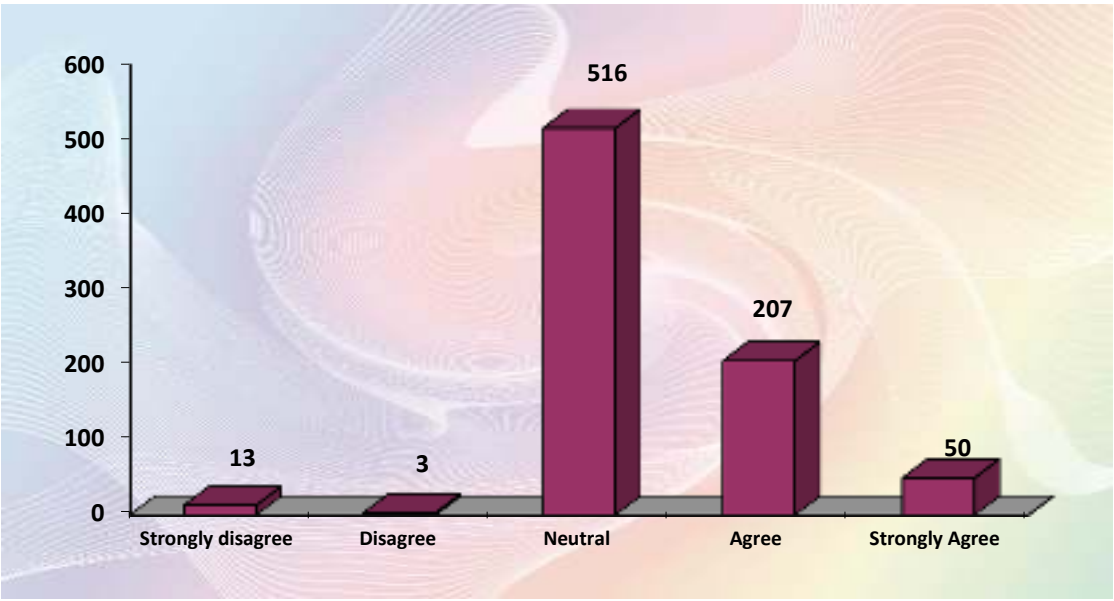
Rationale: As has been stated earlier the dairy activity is an activity allied to agriculture. The agricultural crops do require manures for boosting the crop production and at the same time maintain the quality of the agricultural land. The dairy farmer gets the cow dung as a byproduct of the dairy activity. This cow dung is daily collected and stored in a pit nearby which in course of time gets converted into organic manure which is very much useful for the crops. Apart from the cow dung, the dried and fallen leaves on the farm is also collected and dropped in the cow dung pit as a raw material for the manure. The final product that comes out from the pit is called as Farm Yard Manure (FYM). Sometimes, if the number of livestock is sizable the dairy farmer in the first place uses the cow dung for the biogas plant through which he generates the electricity or gas for the cooking purposes and then slurry left out in the plant is also used as rich manure.

Table 5.15: Response to the statement "My dairy activity fetches adequate FYM for agricultural operations"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	11	13	3	516	207	750
Percentage	1.47	1.73	0.40	68.80	27.60	100

Source: Field survey data collected

Fig. 5.8 : Response to the statement "My dairy activity fetches adequate FYM for agricultural operations"



One of the major inputs in the cultivation of crops is manure. There are two types of fertilizers: one is organic and the other one is inorganic (chemical). The excessive dose of inorganic fertilizers adversely affects the land quality (*Pot*). Therefore, currently there is a campaign run by several organizations to make greater use of organic fertilizers. Farm Yard Manure refers to the decomposed mixture of dung and urine of farm animals along with litter and left over material from roughages or fodder fed to the cattle. Manure is organic matter, mostly derived from animal feces except in the case of green manure, which can be used as organic fertilizer in agriculture. The FYM is good quality manure which can be had from the dairy animals. The availability of the captive FYM certainly helps the dairy farmer to supplement his agricultural input needs.

As high as 96.4% dairy farmers covered by this research have reported that they get adequate FYM through their dairy activity. The saving on account of use of this captive FYM certainly adds to the economic viability of the dairy activity. Very meager percentage of the respondents has replied it in negative (single digit figure).

Statement 4: "I am having a biogas plant in the campus of my residence."

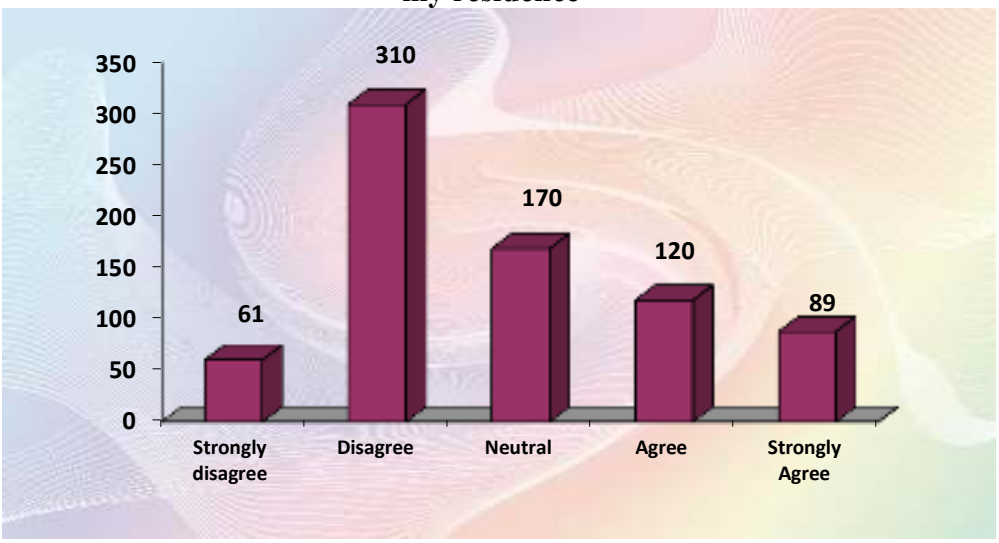
Rationale: Cow dung is the byproduct of the dairy activity. If the livestock holding is sizable, naturally the dairy farmer prefers to have a biogas plant at his residence. The Government of Maharashtra is also providing subsidy for construction of biogas plant. The cow/buffalo dung along with the dried and fallen leaves available on the farm freely can be used as an input for the biogas. This biogas generates electricity on which the farmer can accomplish his cooking gas requirement as well as some bulbs in the house and in Cattle shed (Gotha) too. The slurry –the residue from the biogas plant is used as Farm Yard Manure which is very much useful. If the size of the dairy is exceptionally large the F.M.Y. can also fetch some income as F.M.Y. is in good demand.

Table 5.16: Response to the statement "I am having a biogas plant in the campus of my residence"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	61	310	170	120	89	750
Percentage	8.13	41.33	22.67	16.00	11.87	100

Source: Field survey data collected

Fig. 5.9: Response to the statement "I am having a biogas plant in the campus of my residence"



Interpretation

Biogas is yet another facility which generates power for the dairy farmer from out of the dairy activity. The cow dung and the urine of the dairy animals are the inputs for the biogas plant, and the residue from the used input in the biogas is a rich quality organic fertilizer. Thus the waste from the dairy activity can be used to produce gas required by the dairy farmers which is ultimately used in cooking or providing lighting in the house. Of course, for installation of biogas plant certain minimum number of animals is required. This use of biogas also adds to the economic viability of the dairy activity. The energy generated by the biogas plant is dependable and at zero costs. The use of biogas also results on the health of the females working in the house.

In this research, 27.87% of the respondents have reported that they have biogas plant. 22.67% of the respondents have preferred to be neutral. 49.46% of the respondents have either disagreed or strongly disagreed with the statement that as they do not have biogas plant.

Statement 5: "My dairy society offers me competitive rate."

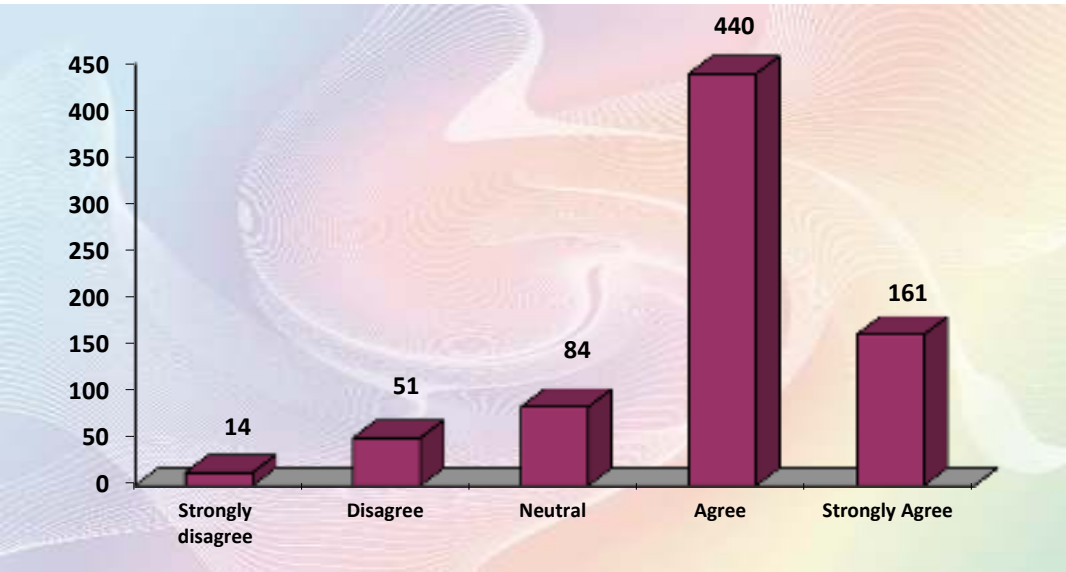
Rationale: This statement has been added just to have feedback from the dairy farmers who are the members of the village milk society about their perception regarding the reasonability of the rate given to them for the milk supplied to the society. The milk rates for the dairy farmers are decided by the District Dairy Union in the instant case Katraj Dairy. At times the dairy farmers supply milk to some private persons/ hotels and they get higher rate depending upon the quality of the milk. The dairy activity in the district is also pursued by the private sector and in order to attract the milk supply at times their rates are marginally more. But this can be compensated by the surplus distributed by the village milk society annually.

Table 5.17: Response to the statement "My dairy society offers me competitive rate"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	14	51	84	440	161	750
Percentage	1.87	6.80	11.20	58.67	21.47	100

Source: Field survey data collected

Fig. 5.10: Response to the statement "My dairy society offers me competitive rate"



The data presented in table 5.17 reveals that 80.14% respondents have received competitive rates form that their dairy society on the other hand 11.20% of the respondents preferred to be neutral, while 8.67% respondents are either disagreed or strongly disagreed with the statement.

Statement 6: "I get regular payment from the society"

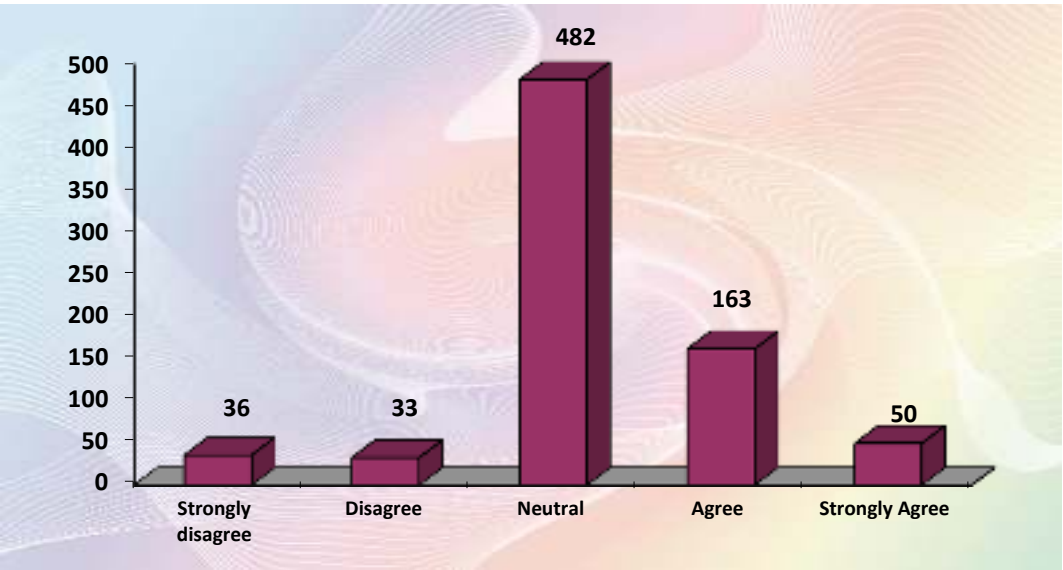
Rationale: Through this statement effort has been made to ascertain the regularity of the payment of the sale proceeds of the milk supplied to the dairy society or the private organizations / individual as the case may be. If the payment is regularly received naturally the dairy farmer's interest in the activity will be retained. If the payment is irregular then there is cause of concern.

Table 5.18: Response to the statement "I get regular payment from the society"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	36	36	33	482	163	750
Percentage	4.8	4.80	4.40	64.27	21.73	100

Source: Field survey data collected

Fig. 5.11: Response to the statement "I get regular payment from the society"



Interpretation

As high as 86% of the respondents have reported that they get regular payment of the sale proceeds of the milk supply. 4.40% preferred to be neutral while 9.6% have either disagreed or strongly disagreed.

Statement 7: "I get prompt loan from the local branch of the bank"

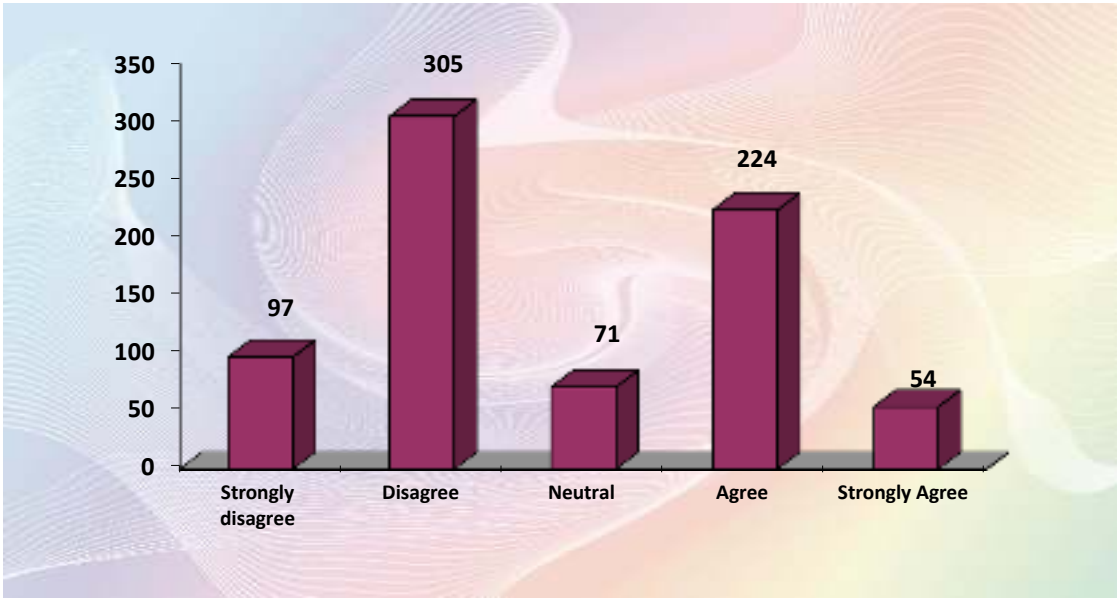
Rationale: For the development of the dairy activity, it is but natural, for various purposes the dairy farmers require the capital investment. India, being a developing country there is shortage of capital formation and in addition to that in Indian context agriculture is totally dependent on the vagaries of the monsoon which leads to low surplus from the agricultural activity quite often. Therefore, the dairy farmers require loan for purchase of livestock, construction of housing arrangement for the livestock, Chaff Cutter machine, cans etc. After the bank nationalization there has been development of a very good network of bank branches even in the rural areas. Through this statement the researcher sought feedback about the availability of the bank loan for dairy purpose.

Table 5.19 : Response to the statement "I get prompt loan from the local branch of the bank"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	97	305	71	224	54	750
Percentage	12.9	40.67	9.47	29.87	7.20	100

Source: Field survey data collected

Fig. 5.12: Response to the statement "I get prompt loan from the local branch of the bank"



Interpretation

37.07% of the respondents have stated that they get loan promptly from the local bank branch. While 9.47% of the respondents preferred to be neutral. On the other hand 54.57% respondents have stated that they either disagree or strongly disagree with the statement that they get loan promptly from the local bank branch.

Statement 8: "I get advice from the dairy authorities for increasing the milk"

Rationale: In order to ensure sustainability of the dairy activity in the normal course there has to be growth in the milk procurement. The dairy society's survival is dependent upon the increasing trend of the milk procurement. Therefore, the dairy authorities in the normal course extend guidance to their members for increasing the milk supply. This can be achieved in two ways - 1) by increasing the size of the livestock holding and 2) increasing the productivity of the existing livestock by

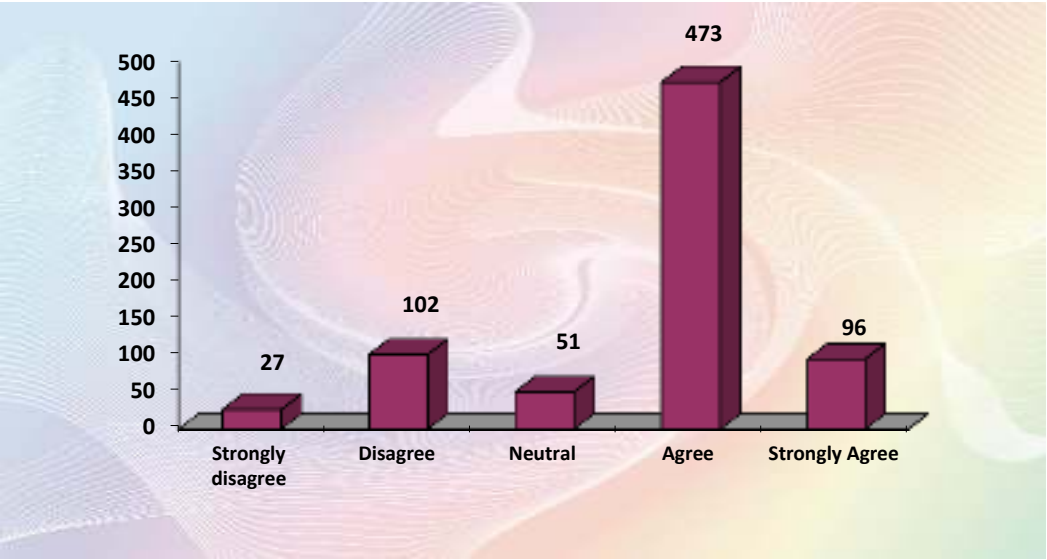
properly ensuring the cattle feed health care of the livestock etc. Through this statement the researcher enquired about the grass root reality, the efforts put in by the dairy society for increasing the milk procurement.

Table 5.20: Response to the statement "I get advice from the dairy authorities for increasing the milk"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	27	102	51	473	96	750
Percentage	3.6	13.60	6.80	63.07	12.80	100

Source: Field survey data collected

Fig. 5.13: Response to the statement "I get advice from the dairy authorities for increasing the milk"



Interpretation

As high as 75.87% of the respondents stated that they get advice from the dairy authorities for increasing the milk. 6.80% of the respondents preferred to be neutral while 17.20% of the respondents either disagreed or strongly disagreed with the statement and stated that they do not get advice from the dairy society for increasing the milk.

Statement 9: "Since establishment of the dairy society the overall income level of the villagers has increased."

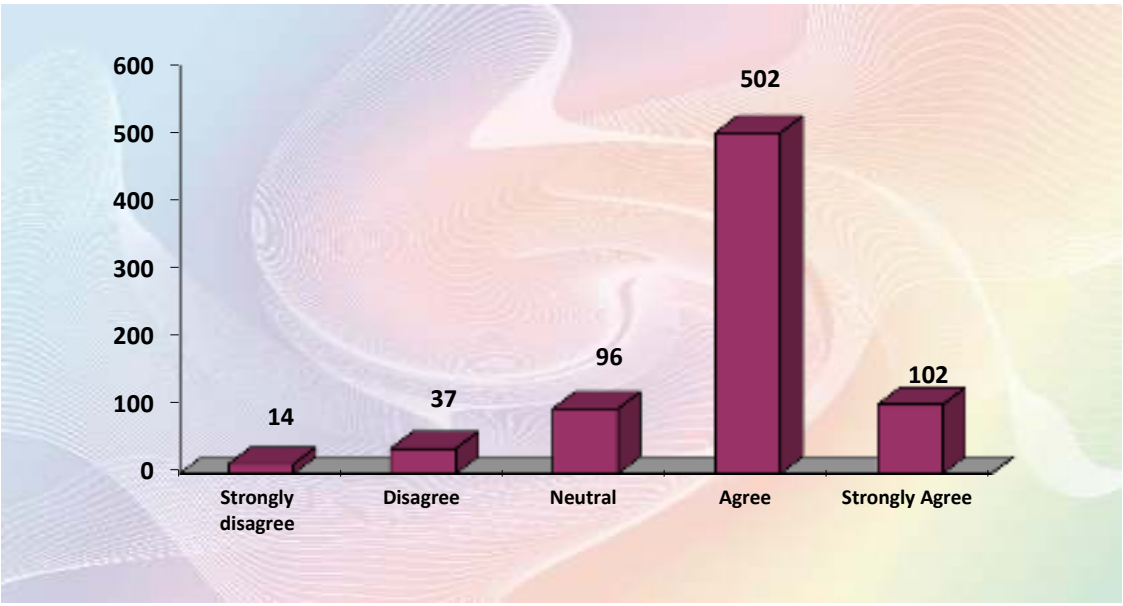
Rationale: Dairy is an economic activity and the objective of running this activity is naturally to earn surplus /profit. When the activity is undertaken continuously, naturally it is expected that it will generate surplus/ profit which, will have positive impact on the total earning of the dairy farmers. When the dairy activity is smoothly running there is bound to be overall surplus generation in the village and the dairy is the instrument through which this income generation is taking place. When there is surplus generation / profit, the villager's life style also improves. In order to understand the perception of the villagers on the income generation this statement has been included.

Table 5.21: Response to the statement "Since establishment of the dairy society the overall income level of the villagers has increased."

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	14	37	96	502	102	750
Percentage	1.87	4.93	12.80	66.93	13.60	100

Source: Field survey data collected

Fig. 5.14: Response to the statement "Since establishment of the dairy society the overall income level of the villagers has increased."



Interpretation

To the extent of 80.53% of the respondents have stated that the establishment of the dairy society has led to the increase in the income level of the villagers, on the other hand 12.80% respondents preferred to be neutral while negligible percentage (6.8%) either disagreed or strongly disagreed with the statement.

Statement 10: "The dairy activity has given employment to number of youths in the village."

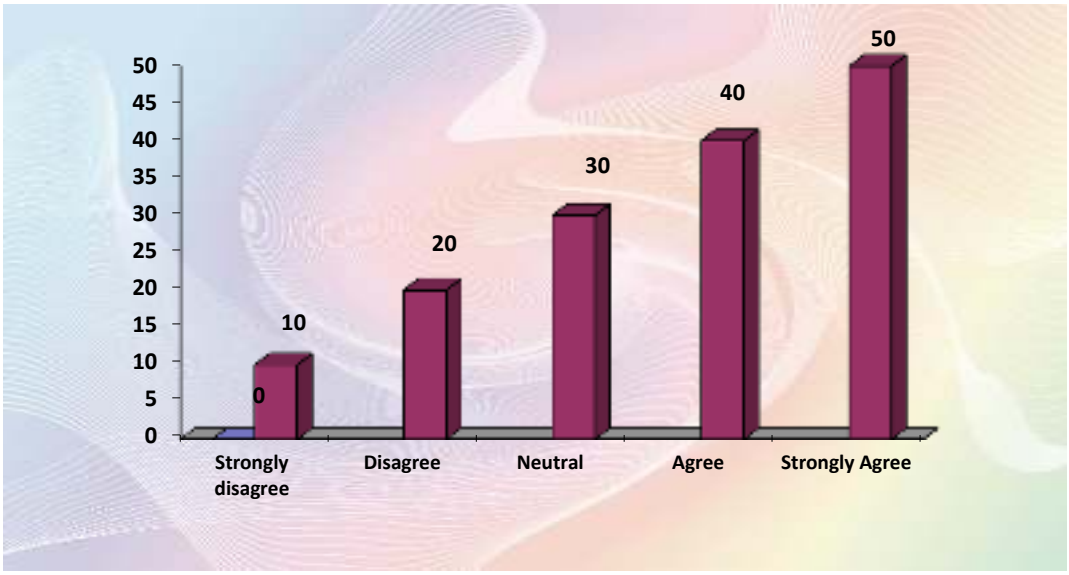
Rationale: In the rural area because of the disguised unemployment, number of youth from this area is migrating to the nearby urban area. This is because the agriculture activity cannot provide round the year employment. The situation has led to the crisis when farm mechanization is making inroads in the agricultural sector. On the other hand the dairy activity in the rural area naturally opens new opportunities for the youth. They may either start dairy activity of their own, or they can open milk collection centres, starting of cattle feed mill, shops for supply of veterinary medicines, etc. All these are the self-employment endevours. The researcher has enquired about the perception of the respondent dairy farmers on this aspect.

Table 5.22 : Response to the statement "The dairy activity has given employment to number of youths in the village."

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	26	138	95	386	105	750
Percentage	3.47	18.40	12.67	51.47	14.00	100

Source: Field survey data collected

Fig. 5.15: Response to the statement "The dairy activity has given employment to number of youths in the village."



Interpretation

65.47% respondents have stated that the dairy activity has provided employment to number of youths in the village. The employment is in different forms. It may be pursuing self-employment of conducting the dairy activity or collecting the milk from the nearby villages and supply it to the dairy society and providing cattle feed to the dairy farmers etc. 12.67% respondents remained neutral while, 21.87% respondents have either disagreed or strongly disagreed with the statement.

Statement 11: "I have part of my land under irrigation and it has helped me to take up cash crops"

Rationale: Over the years the Government has been trying to provide irrigation facilities in the villages. Even agriculturists on their own with the help of the banks have been trying to convert maximum possible of their dry land into irrigated land. In the dry land farming the agriculturist is solely at the mercy of the monsoon. There is no certainty of surplus from the dry land farming. Therefore with the efforts of both the Govt. as well as the agriculturists, the land under irrigation is increasing. Once there is assured source of water the agriculturists cultivate cash crops like sugarcane, onion, vegetables etc. Here, it is worthwhile to note that according to the govt. animal breeding policy, Holstein Friesian (H.F.) breed is to be used in the irrigation area and Jersey breed is to be used in the non-irrigated area. Since the study area of this

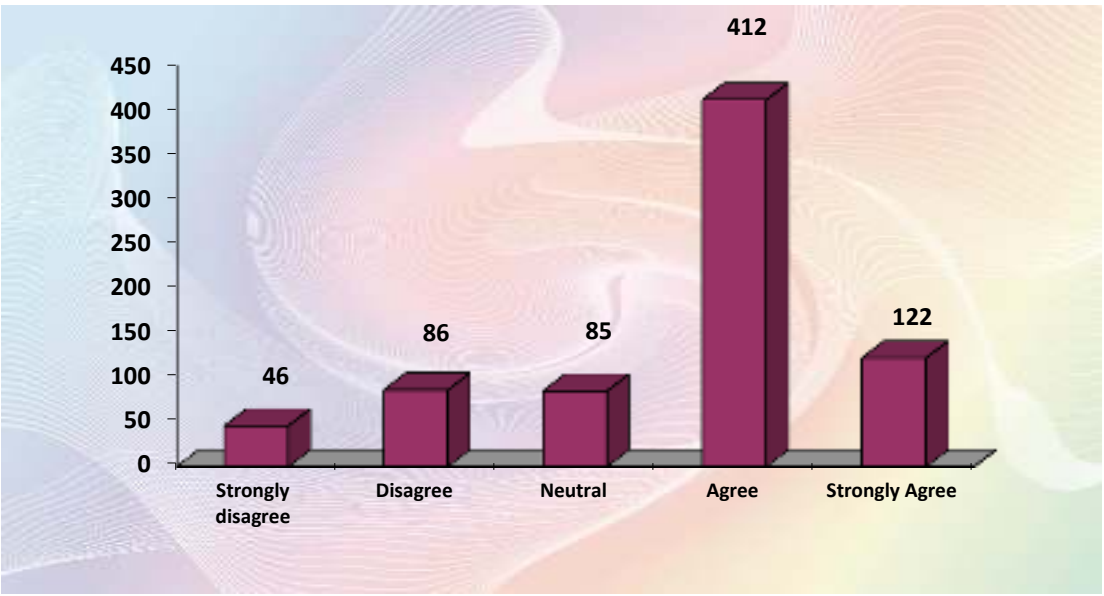
research also comprises of both dry and irrigated area the researcher has included this statement. This results in surplus generation from the agricultural activity which enhances the income of the farmer.

Table 5.23: Response to the statement "I have part of my land under irrigation and it has helped me to take up cash crops"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	46	86	85	412	122	750
Percentage	6.13	11.47	11.33	54.93	16.27	100

Source: Field survey data collected

Fig. 5.16: Response to the statement "I have part of my land under irrigation and it has helped me to take up cash crops"



Interpretation

The data in table 5.23 indicates that 71.2% of the respondents have part of their holding under irrigation and that they cultivate cash crops in it. 11.33% of the respondents have remained neutral while 17.60% have either disagreed or strongly disagreed. This means majority of the agriculturists have some irrigated land holding.

Statement 12: "Our society organizes training programmes for the dairy farmers"

Rationale: In the pursuit of increasing their milk collection some of the dairy milk societies conduct training programs for the dairy farmers. Through these training

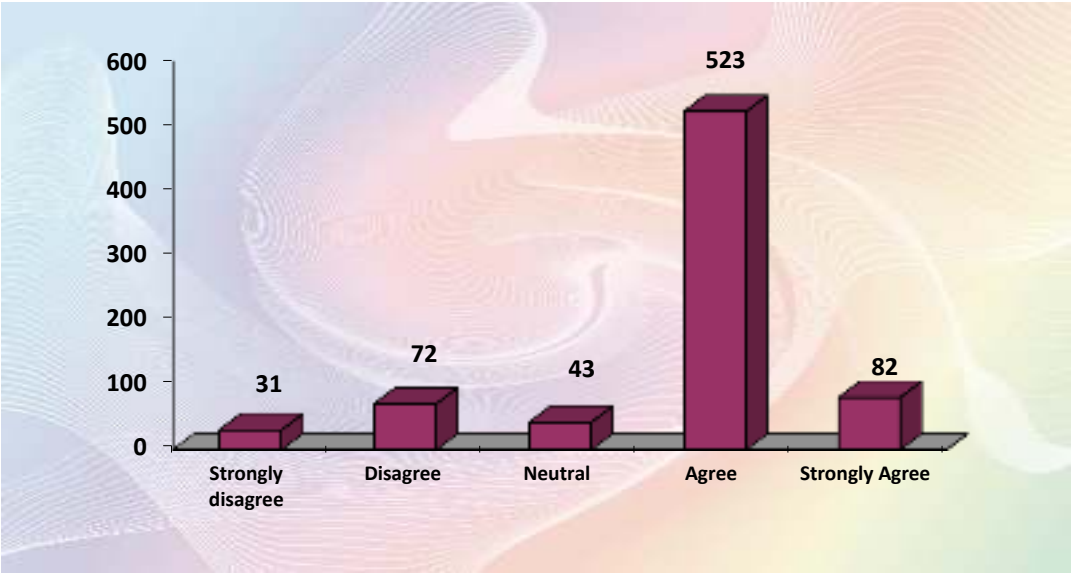
programs the dairy farmers are given guidance for proper maintenance of the livestock. These training programs cover varied topics related to the dairy activity. The dairy societies seek the help from the animal husbandry department of the Government of Maharashtra as well as the District Dairy Union like Katraj Dairy. The statement was included just to ascertain the developmental role the milk societies are playing.

Table 5.24: Response to the statement "Our society organizes training programs for the dairy farmers"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	31	72	43	523	82	750
Percentage	4.13	9.60	5.73	69.73	10.93	100

Source: Field survey data collected

Fig. 5.17: Response to the statement "Our society organizes training programs for the dairy farmers"



Interpretation

It is observed from table 5.24 that 80.66% of the respondents have confirmed that their society organizes training programs for the dairy farmers. 5.73% respondents preferred to be neutral while 13.73% have either disagreed or strongly disagreed with the statement. It means that overwhelming majority of the dairy societies are conducting training programs for their members.

Statement 13: "I maintain my dairy activity accounts separately."

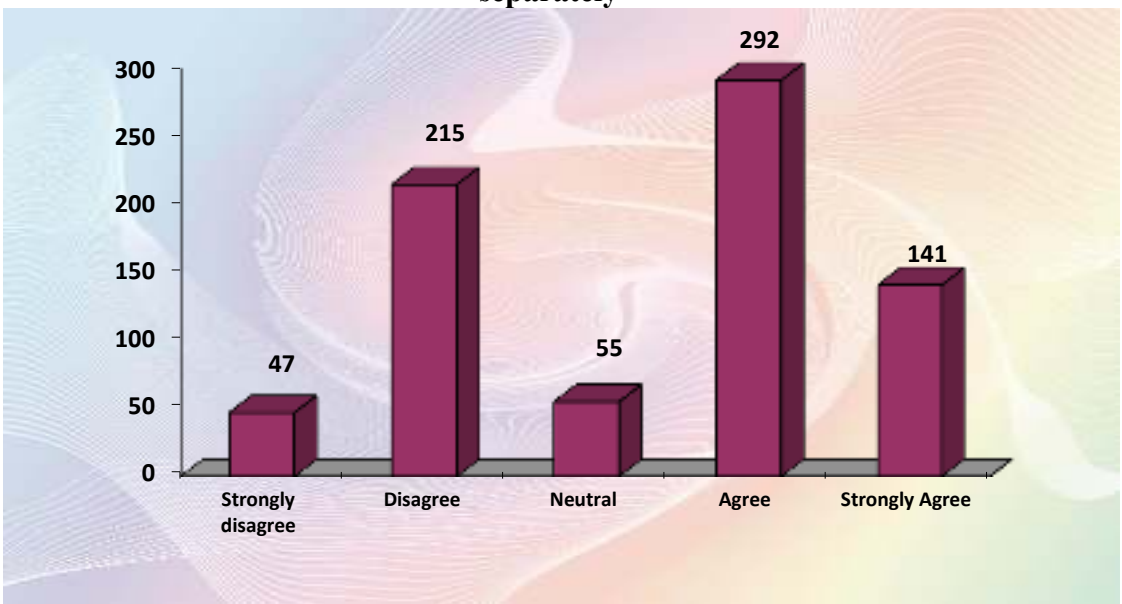
Rationale: The success of any enterprise is dependent on the cost consciousness of the management. For this purpose the basic requirement is to maintain proper books of accounts and create proper records, review of which help the management to take rational decisions based on the data. Traditionally because of the illiteracy the agriculturists are not maintaining formal books of accounts under various pretexts. E.g. what is the need for such accounts? We may be required to pay income tax etc. For this purpose the societies are also now educating the dairy farmers about the need for maintaining proper books of accounts. It is heartening to note that the Katraj Dairy is providing their dairy societies adequate account books specially designed standard account books which help the dairy farmer to assess the outcome of this dairy activity. In order to ascertain the grass root reality statement has been included in the study. .

Table 5.25: Response to the statement "I maintain my dairy activity accounts separately"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	47	215	55	292	141	750
Percentage	6.27	28.67	7.33	38.93	18.80	100

Source: Field survey data collected

Fig. 5.18 : Response to the statement "I maintain my dairy activity accounts separately"



Interpretation

The data in the table 5.18 unearths the fact that merely 57.73% of the dairy farmers maintain separate dairy activity accounts. 7.33% respondents are neutral and the 34.94% respondents have either disagreed or strongly disagreed. Maintaining separate account for the dairy activity indicates that the dairy farmer is conscious about the costs and benefits of the dairy activity. The success of the management of any activity depends on the cost consciousness of the activity. Still a large portion of the dairy farmers are not maintaining separate accounts for the dairy activity. Here it will be worth mentioning that Katraj Dairy has specially designed account books and those are supplied to the dairy farmers free of charge.

Statement 14: "After the dairy society has come into being there are lots of changes in our village as we can now afford to pay for the welfare of the society."

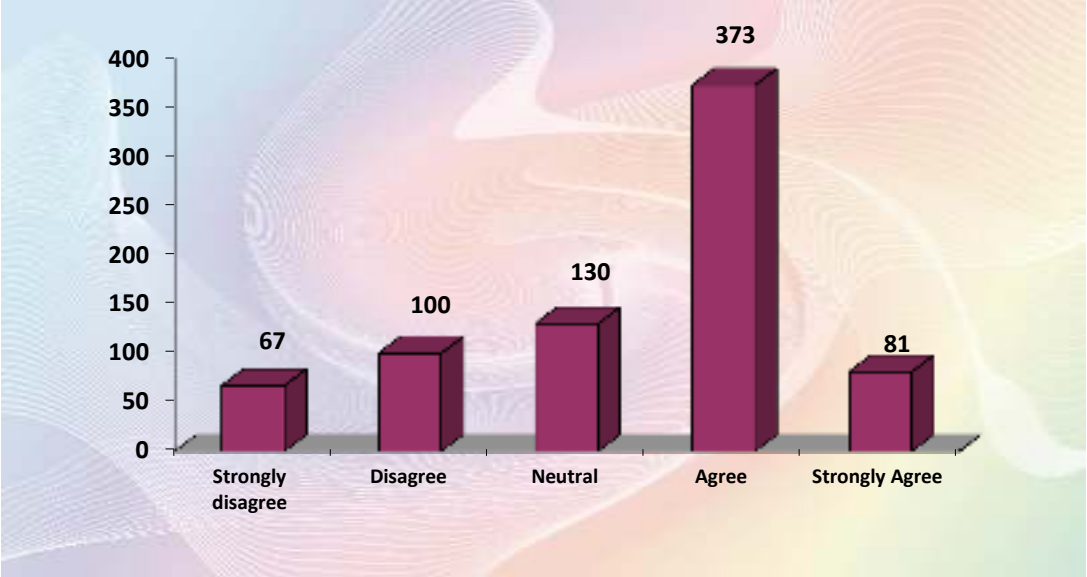
Rationale: In the normal course, agriculturists get seasonal income, as and when the crop is harvested. His main difficulty used to be availability of liquidity, i.e. availability cash in between the harvesting seasons. The dairy activity is such an activity which makes ready cash available at an interval of a fortnight or monthly. The dairy farmer gets the sale proceeds of the milk supplied. The dairy activity supplements the income kitty of the agriculturists. It is but natural that the surplus generated from the dairy activity provides some room for improvement of the life style of the dairy farmer. This increased income level has changed the approach of the socio-economic developmental activities. Their approach towards hygienic conditions has improved. The incremental purchasing power has helped the villagers for education, and communication etc. All this, is the result of the increased purchasing power that has been created by the dairy societies.

Table 5.26: Response to the statement "After the dairy society has come into being there are lots of changes in our village as we can now afford to pay for the welfare of the society."

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	67	100	130	373	81	750
Percentage	8.93	13.33	17.33	49.73	10.80	100

Source: Field survey data collected

Fig. 5.19: Response to the statement "After the dairy society has come into being there are lots of changes in our village as we can now afford to pay for the welfare of the society."



Interpretation

It has been revealed that 60.53% of the respondents have confirmed that after the dairy society came into being in the village, there are lots of changes in the village because with the dairy activity lots of money started flowing in the village. Welfare activities are increased because the purchasing power of the villager's stands improved. 17.33% respondents preferred to be neutral while 22.26% respondents have either disagreed or strongly disagreed.

Statement 15: "The Govt. Veterinary Doctor visits our area regularly"

Rationale: The Government of India as well as the state Governments have very well convinced the role played by the dairy activity in the rural area. It has a visual impact and the dairy farmer starts earning without any gestation period. The Government is ensuring that the dairy farmers are getting adequate bank loan for development of the dairy activity. One more key ingredient in the sound development of the dairy activity is the availability of the veterinary services at the village level. Over the years the government has improved the availability of various veterinary services in the vicinity of the dairy societies. This helps the dairy farmer to avail of veterinary services to ensure the healthcare of the livestock. Through this statement

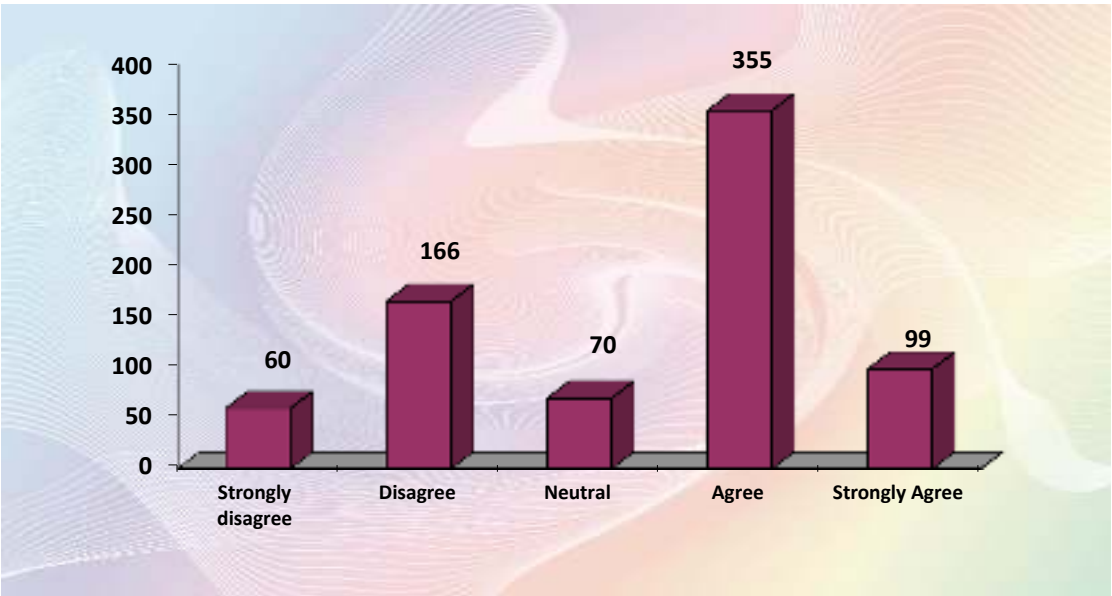
the first hand information from the grass root level has been collected and depicted in table 5.27.

Table 5.27: Response to the statement "The Govt. Veterinary Doctor visits our area regularly"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	60	166	70	355	99	750
Percentage	8	22.13	9.33	47.33	13.20	100

Source: Field survey data collected

Fig. 5.20: Response to the statement "The Govt. Veterinary Doctor visits our area regularly"



Interpretation

The data presented table 5.20 brings out the fact that the Govt. veterinary doctor visits the rural area regularly. 60.53% of the respondents have vouched for this. 9.33% respondents preferred to be neutral. 30.13% respondents have either disagreed or strongly disagreed with the statement. Here it will be worth mentioning that apart from the govt. even the District Dairy Union (Katraj Dudh Sangh) also provides veterinary support to the dairy societies (in turn to their members).

Statement 16: "Artificial Insemination" centre is within a radius of 5 Kms. from our village."

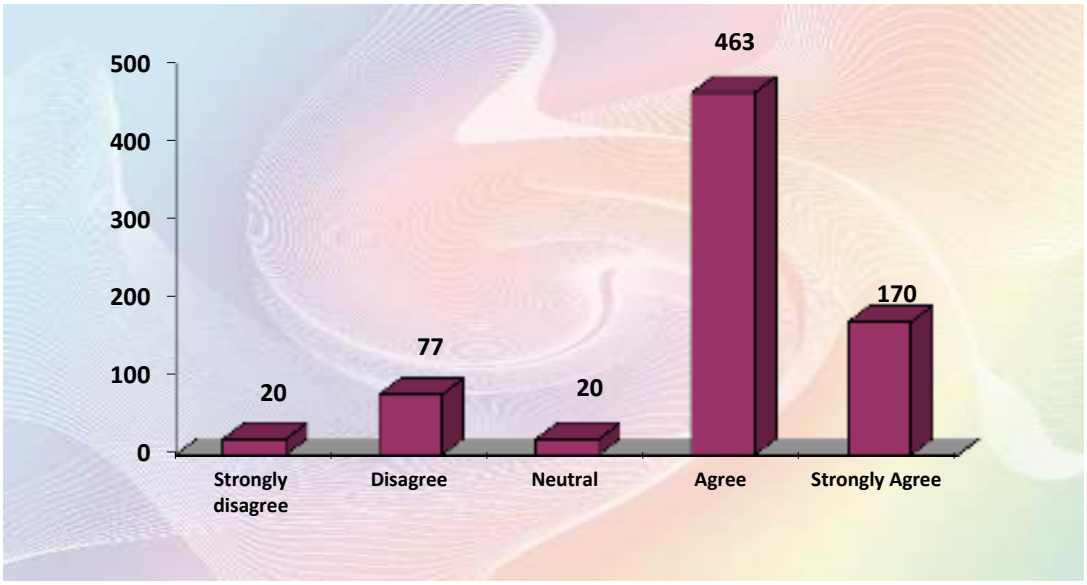
Rationale: In order to ensure that the quality of the livestock also improves and the milk production increases, there is need to ensure that quality semen is available to the dairy farmers at a short notice. Therefore, the govt. has appointed requisite trained staff which is available in the vicinity of the dairy farmer. Now the need of the hour is to educate the dairy farmers about insisting on proven semen, as well as care to be taken while administering the artificial insemination. The statement was included to understand the grass root reality, which is presented in table 5.28..

Table 5.28: Response to the statement "Artificial Insemination" centre is within a radius of 5 Kms. from our village."

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	20	77	20	463	170	750
Percentage	2.67	10.27	2.67	61.73	22.67	100

Source: Field survey data collected

Fig. 5.21 : Response to the statement "Artificial Insemination" centre is within a radius of 5 Kms. from our village."



Interpretation

Table 5.28 reveals that 84.4% of the respondents have arrived for the facility of artificial insemination and the centre is in the proximity from their village (say within a radius of 5 Kms.). It is a good sign. Now the only concern will be whether high quality proven semen is available with them or otherwise. This aspect has been dealt in the subsequent statements.

Statement 17: "We get cattle feed from the Village Milk producers Society of which I am a member"

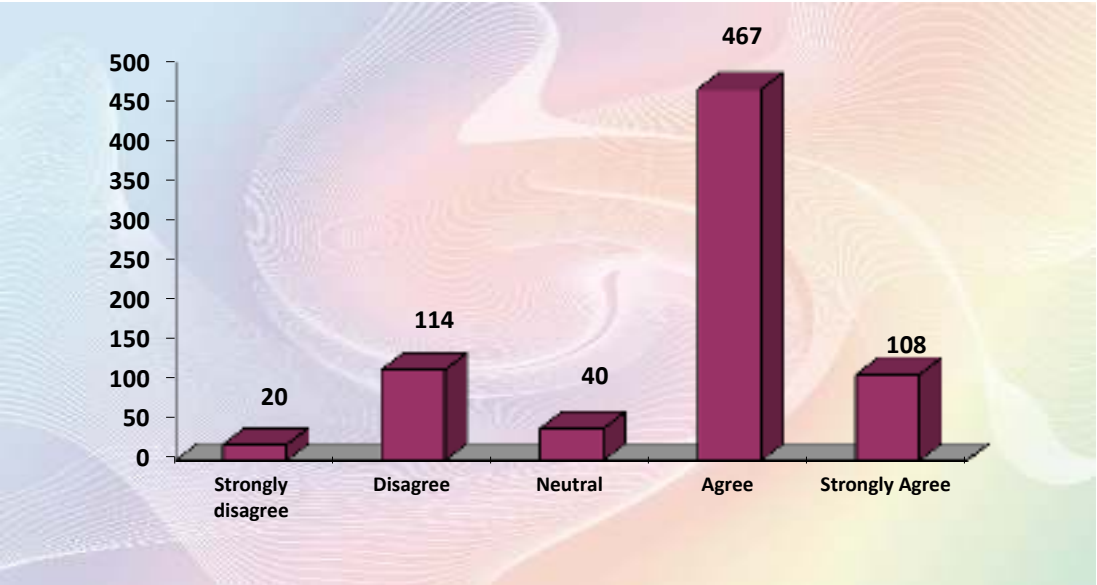
Rationale: In order to have good quality milk production the diet of the livestock is also of very much importance. If good quality of cattle feed in adequate quantity is given to the livestock it will give higher yield. There are some dairy milk societies which make arrangement for supply of cattle feed of good quality and in required quantity. In this process the society also earns some commission from the feed suppliers as the society resorts to bulk buying and the members also stand to benefit as the society supplies the cattle feed on credit and deduct from the milk proceeds. The member also get share in the commission for such activities in the form of bonus at the end of the year on the availability of the surplus. There are some dairy units which have their own cattle feed manufacturing units.

Table 5.29 : Response to the statement "We get cattle feed from the Village Milk producers Society of which I am a member"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	20	114	40	467	108	750
Percentage	2.67	15.20	5.33	62.27	14.40	100

Source: Field survey data collected

Fig. 5.22: Response to the statement "We get cattle feed from the Village Milk producers Society of which I am a member"



Interpretation

The data in table 5.29 reveals that 76.67% of the respondents have confirmed availability of cattle feed from the village Milk producer's society of which they are the member. Hardly 5.33% respondents remained neutral and 17.87% respondents have either disagreed or strongly disagreed with the statement.

Statement 18: "There is chaff cutter machine in the vicinity which offers services to us"

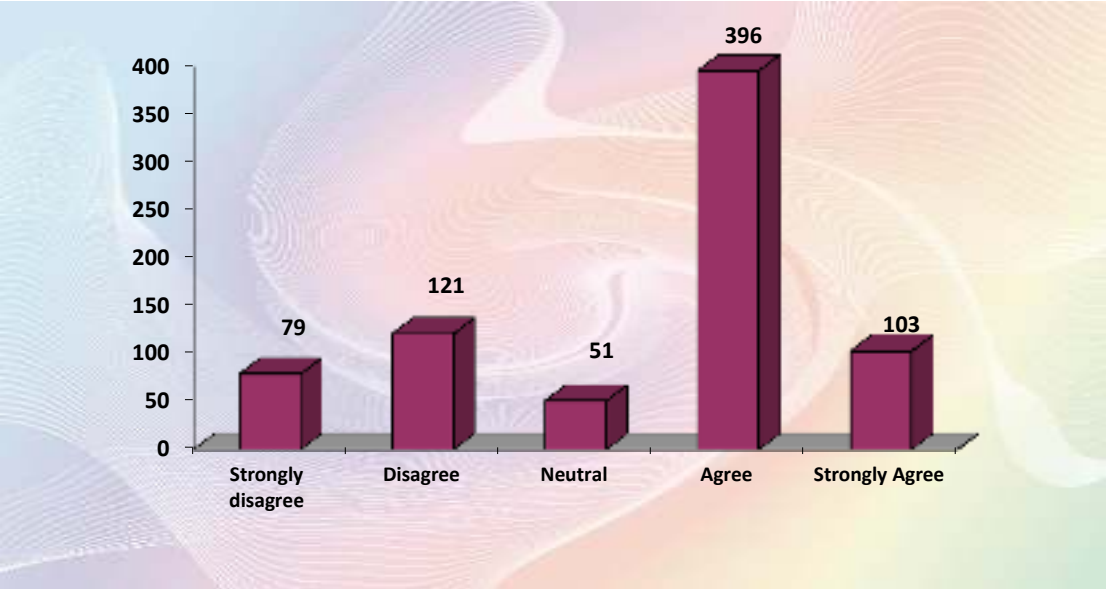
Rationale: While managing the diet for the livestock it is always better to provide in better eatable form which can be properly chewed. Instead of dry crop stalk if the same is put through chaff cutter the stalk is cut into small pieces which supports the livestock to chew it easily. Besides, the dairy farmer can add some other food ingredients like mineral mixture, vitamins or food supplements to enrich it which will have positive impact on the milk production. Normally if the livestock with the dairy farmer is in the range of 5 to 10, he can afford to have own chaff cutting machine as well as help the other dairy farmers to get their own stalk cut through the chaff cutter. There are some unemployed youth who are now providing this service to the dairy farmers and maintain their livelihood. .

Table 5.30: Response to the statement "There is chaff cutter machine in the vicinity which offers services to us"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	79	121	51	396	103	750
Percentage	10.5	16.13	6.80	52.80	13.73	100

Source: Field survey data collected

Fig. 5.23: Response to the statement "There is chaff cutter machine in the vicinity which offers services to us"



Interpretation

If the feed whether dry or green fodder is given duly processed through chaff cutter it is easier for the cattle to digest it and it will have good effect on the milk production. It will also ensure wastage of the dry or green fodder. In the village large dairy farmers have their own chaff cutting machine while some youth also run mobile service for cutting the fodder at the door steps of the dairy farmers. The data presented in table 5.30 reveals that 66.53% of the respondents have confirmed the availability of such services are available to the dairy farmers.

Statement 19: "The milk collection arrangements are satisfactory"

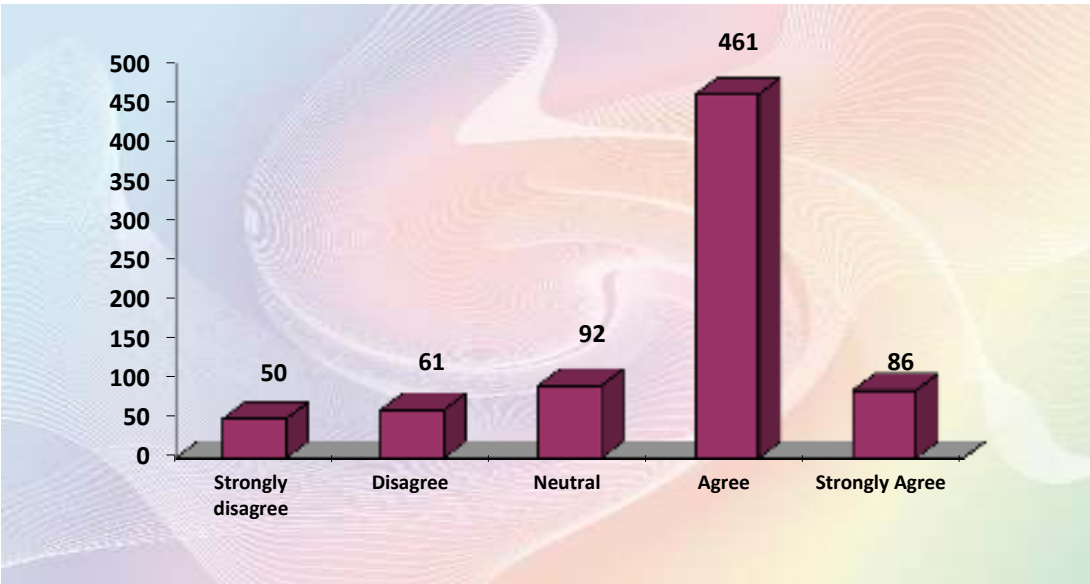
Rationale: Milk is perishable. Therefore, it is not sufficient to have production of milk but it should be timely (which is the essence of the act) taken to the dairy society and in hygienically maintained cans. Even at the society also proper hygienic conditions are required to be observed. Timely it should be sent to centers where bulk coolers facility is available or chilling centers. In addition to it there should be proper weighing arrangements in which the dairy farmers have confidence. Therefore, through this statement feedback on the milk collection arrangement has been obtained from the field and presented in table 5.31.

Table 5.31: Response to the statement "The milk collection arrangements are satisfactory"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	50	61	92	461	86	750
Percentage	6.67	8.13	12.27	61.47	11.47	100

Source: Field survey data collected

Fig. 5.24: Response to the statement "The milk collection arrangements are satisfactory"



Interpretation

Efficient milk collection is also a plus point for the success of any dairy. It has been revealed that 72.94% of the respondents are happy with the arrangements of milk collection is satisfactory as well as their societies are also taking adequate care to

handle the milk collected. 12.27% of the respondents remained neutral while 14.80% of the respondents have either disagreed or strongly disagreed with the statement.

Statement 20: "From out of dairy income I have been able to construct cattle shed of good quality."

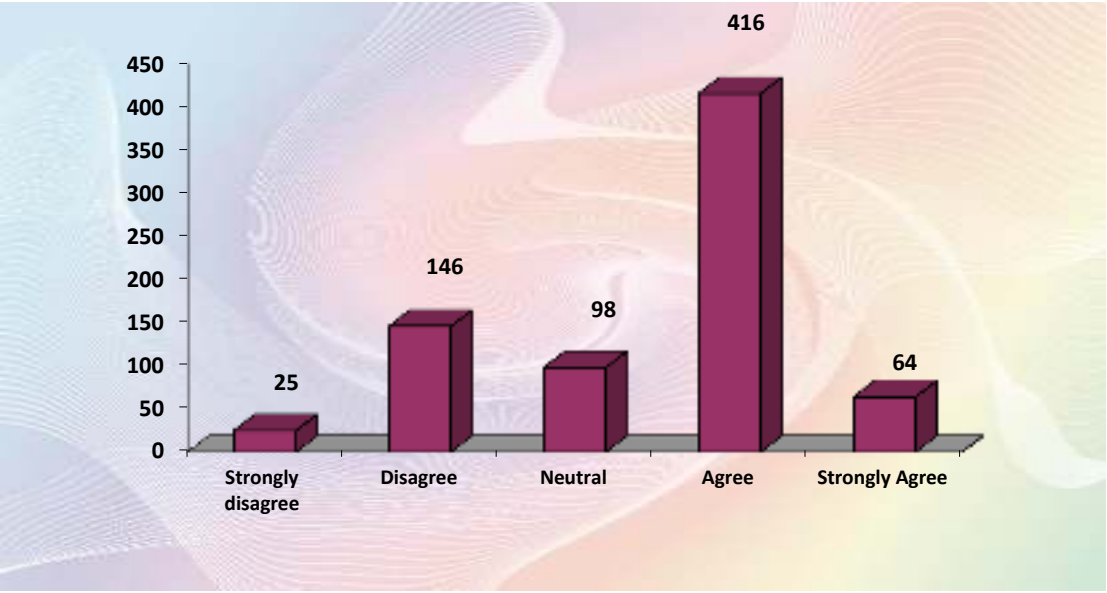
Rationale: This feedback is sought from the dairy farmers to understand their mindset for disposal of the surplus generation from the dairy activity. Normally it is expected that a part of the surplus generated from the dairy activity is used to improve the said activity. In technical terms it is called the ploughing back of profit in the business or retention of part of profit in business which helps the further growth of the business activity. Depending upon the size of the livestock even adding the livestock can also be considered.

Table 5.32: Response to the statement, "From out of dairy income I have been able to construct cattle shed of good quality."

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	25	146	98	416	64	750
Percentage	3.33	19.47	13.07	55.47	8.53	100

Source: Field survey data collected

Fig. 5.25: Response to the statement "From out of dairy income I have been able to construct cattle shed of good quality."



Interpretation

Ploughing back of profits is an accounting term which means retention of at least part of the profit in the business. This feedback reveals the mindset of the dairy farmer. If, from out of the surplus generated from the dairy activity a part is used for improving the infrastructure for the dairy activity naturally it will have a positive impact on the business. Cattle sheds have also some contribution in the wellbeing of the animals. Therefore, this feedback was sought and it was a matter of satisfaction that 72.94% of the respondents have confirmed that they do plough back part of the surplus generated for such activities like construction of good quality cattle sheds etc.

Statement 21: "The rate given by the private dairy is higher than the rate offered by the Dudh Society."

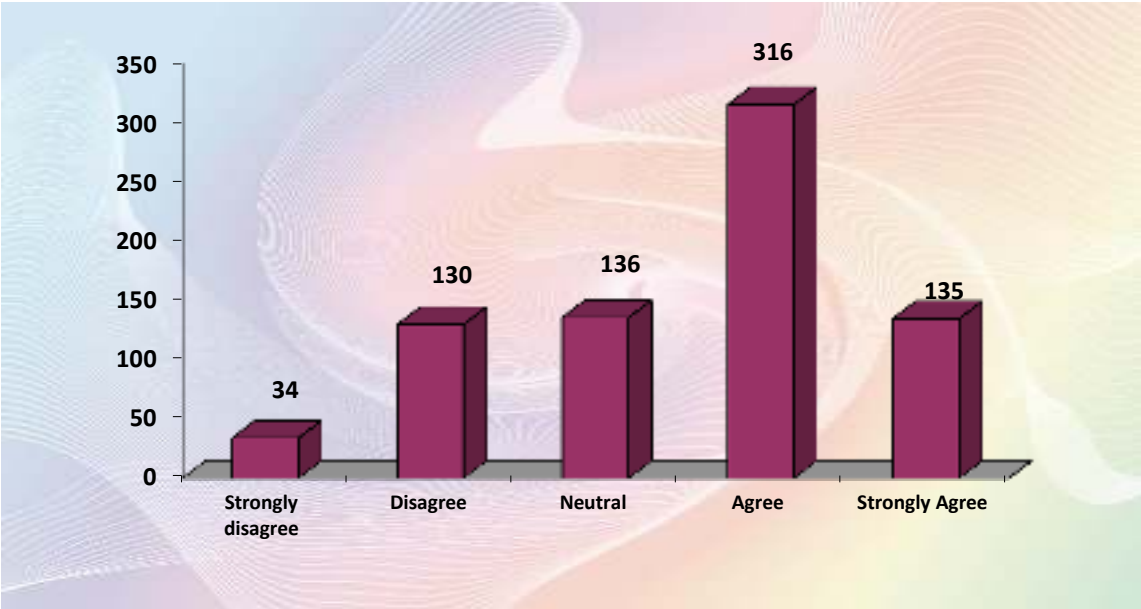
Rationale: Apart from the dairy societies there is presence of milk collection centers of the private dairy firms in some of the villages. It means there is a competition so far as milk collection is concerned. One of the factors that induce the dairy farmer to divert to the other centre is the rate given by the milk purchaser. In order to have information about the presence of the competition for milk collection this data is sought from the identified dairy farmers. There is other side to this issue. The private dairy offers better rate only when the quality of the milk is worth paying better rate. However, at the current situation some of the district milk unions are paying better rates than that of the private dairies in Maharashtra. This is mainly because of the government's directions to pay Rs.27 per ltr. of cow milk. The govt. of Maharashtra has appointed a committee to go into this issue and to decide the formula to work out the milk rates to be given.

Table 5.33: Response to the statement "The rate given by the private dairy is higher than the rate offered by the Dudh Society"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	34	130	136	316	135	750
Percentage	4.53	17.33	18.13	42.13	18.00	100

Source: Field survey data collected

Fig. 5.26: Response to the statement "The rate given by the private dairy is higher than the rate offered by the Dudh Society"



Interpretation

The data presented in the table 5.31 reveals that 60.13% of the respondents either agreed or strongly agreed with the statement that the rate given by the private dairy societies is higher than the rate given by Cooperative Milk Societies. This situation varies from time to time. Because of the Govt. of Maharashtra's directions the case is presently reverse.

Statement 22: "The payment of the sale proceeds of the milk supplied to the Society is credited to our savings bank accounts."

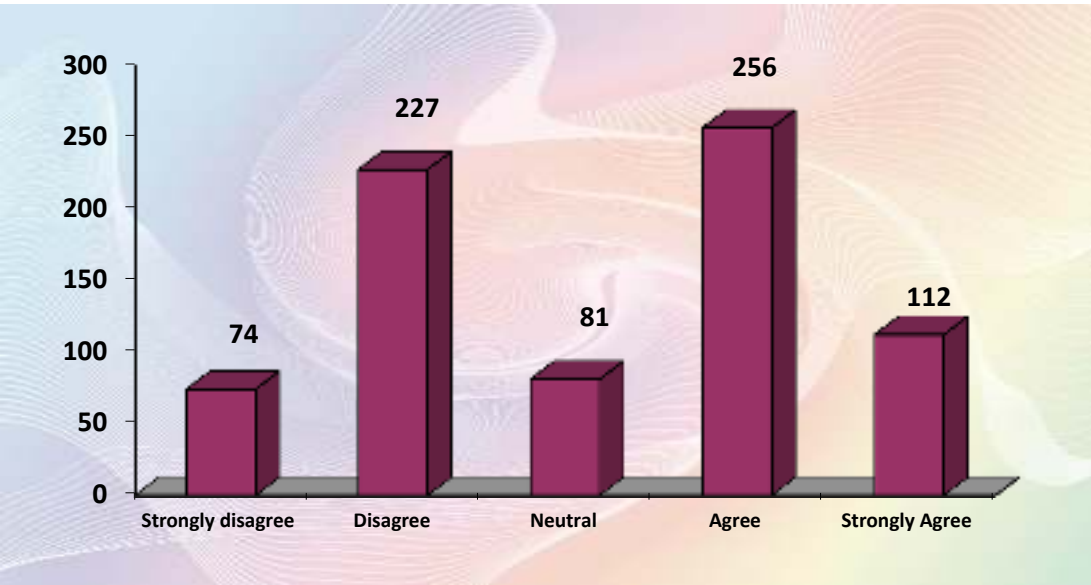
Rationale: This statement has been included to understand the mode of payment of the sale proceeds of the milk. Normally if there is a cash payment then there are number of attractions for diversion of the funds. Besides, the present government strategy is to encourage cash less transactions. Through this statement the researcher has ascertained the mode of payment of the sale proceeds. If it is credited to the bank account, the dairy farmer will be able to inculcate the banking habits and will contribute to the government campaign for cash less transaction. The data related to payments has been collected during field study and presented in the table 5.34.

Table 5.34 : Response to the statement "The payment of the sale proceeds of the milk supplied to the Society is credited to our savings bank accounts."

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	74	227	81	256	112	750
Percentage	9.87	30.27	10.80	34.13	14.93	100

Source: Field survey data collected

Fig. 5.27: Response to the statement "The payment of the sale proceeds of the milk supplied to the Society is credited to our savings bank accounts."



Interpretation

49.06% of the respondents reported that the payment of sales proceeds of the milk supplied to the society have been credit to their savings bank accounts. On the other hand, 10.80% of the respondents preferred to be neutral while 40.14% of the respondents have either disagreed or strongly disagreed with the statement.

Statement 23: "I have insured my cattle stock with the insurance company"

Rationale: The general insurance companies offer cattle insurance. If the livestock has been purchased through bank loan, it is the pre-condition of the bank to take livestock insurance form the insurance company on the bank's panel. In the event of premature death of the cattle the insurance company settles the claim so that the dairy

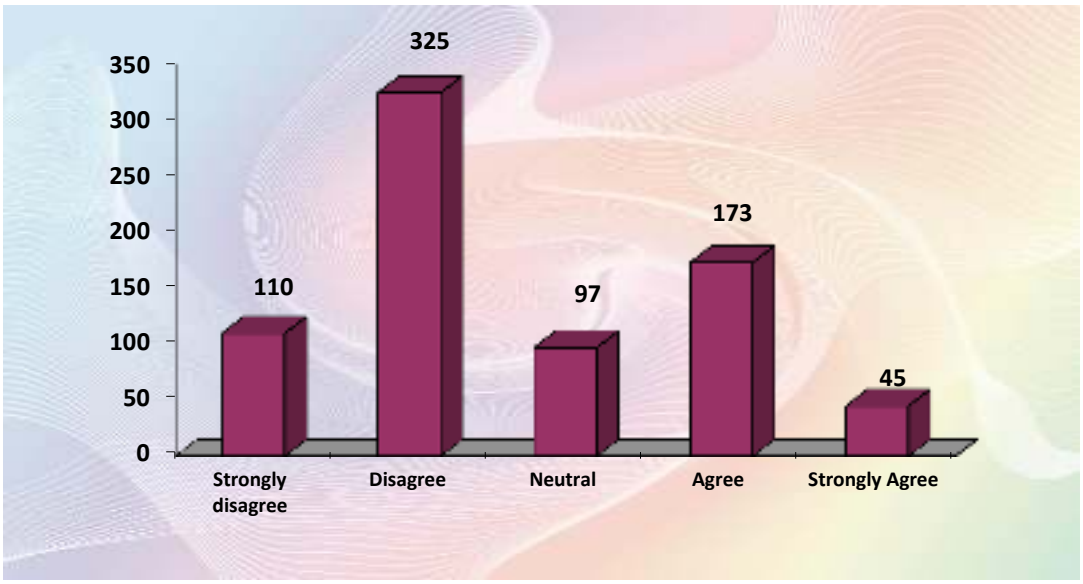
farmer is not put to loss. However, if there is no bank loan, in that case what is the position of the cattle insurance is to be ascertained through this feedback. In fact the dairy farmers should protect their interests by insuring the cattle and timely renewing it by paying the insurance premium. Failure to insurance the cattle, dairy farmer is exposing himself to the risk. In this regard the dairy farmers are required to be educated by the dairy societies.

Table 5.35: Response to the statement "I have insured my cattle stock with the insurance company"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	110	325	97	173	45	750
Percentage	14.7	43.33	12.93	23.07	6.00	100

Source: Field survey data collected

Fig. 5.28: Response to the statement "I have insured my cattle stock with the insurance company"



Interpretation

It has been revealed from the data presented in table 5.35 that hardly 29.07 % respondents have insured their milk animals. 12.93% have preferred to be neutral. 58.03% of the respondents have either disagreed or strongly disagreed with the statement.

Statement 24: "I had an occasion to put up an insurance claim and my experience of claim settlement is satisfactory."

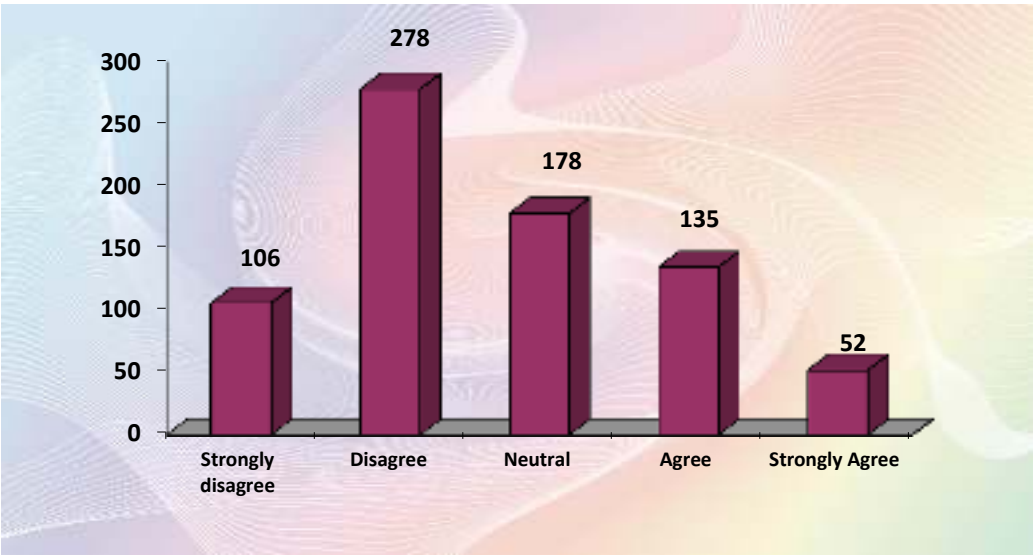
Rationale: It is not sufficient to take the cattle insurance cover but at the same time the dairy farmers should be guided by the dairy society/financing bank to put up insurance claim whenever there is such occasion. This statement is included just to have feedback as to how promptly the insurance companies settle the claims lodged. Normally, in any insurance company there is delay dallying tactics when it comes to settlement of claim as there is outgoing of money. The equal amount of efficiency shown at the time of collection of the insurance premium should also be shown by the insurance company when they are required to pay claims by the dairy farmer.

Table 5.36: Response to the statement "I had an occasion to put up an insurance claim and my experience of claim settlement is satisfactory."

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	106	278	178	135	52	750
Percentage	14.1	37.07	23.73	18.00	6.93	100

Source: Field survey data collected

Fig. 5.29: Response to the statement "I had an occasion to put up an insurance claim and my experience of claim settlement is satisfactory."



Interpretation

Hardly 24.93% of the respondents have expressed their agreement with fully or strongly with the statement. The number of respondents who have disagreed or

strongly disagreed with the statement is 47.8%, which is relatively high. However, considering the low level of motivation for the cattle insurance in the rural areas a fresh approach is required to be taken both by the financing banks as well as by the insurance companies. Even the dairy societies being stake holders should also take a lead in this regard.

Statement 25: "I have adequate source of water to meet the water requirement of the dairy activity."

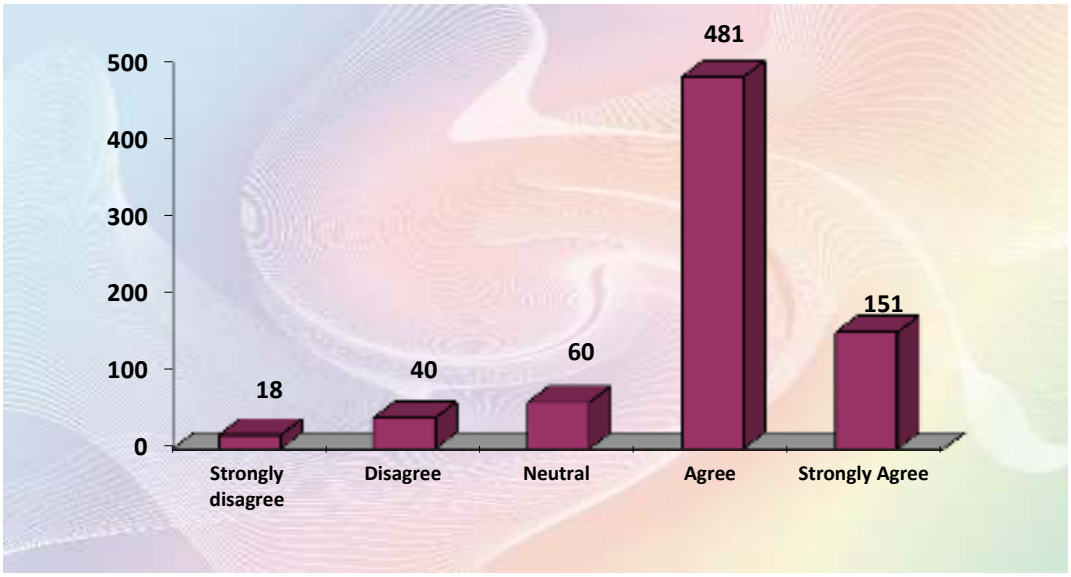
Rationale: Dairy activity requires availability of good amount of water. Firstly, for drinking purposes, secondly for maintaining cleanliness of the livestock housing and other purposes for cleaning the dairy utensils etc. The livestock also requires potable water in order to ensure good health of the livestock. If the water is available in abundance naturally there will be no healthcare problems at the dairy farm.

Table 5.37: Response to the statement "I have adequate source of water to meet the water requirement of the dairy activity"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	18	40	60	481	151	750
Percentage	2.4	5.33	8.00	64.13	20.13	100

Source: Field survey data collected

Fig. 5.30: Response to the statement "I have adequate source of water to meet the water requirement of the dairy activity"



Interpretation

The data presented in table 5.37 reveals that 84.26% of the respondents have either agreed or strongly agreed with the statement that they have adequate water to meet their requirement of water for dairy.

Statement 26: "The dairy activity enables us to have liquid cash for our day to day requirements"

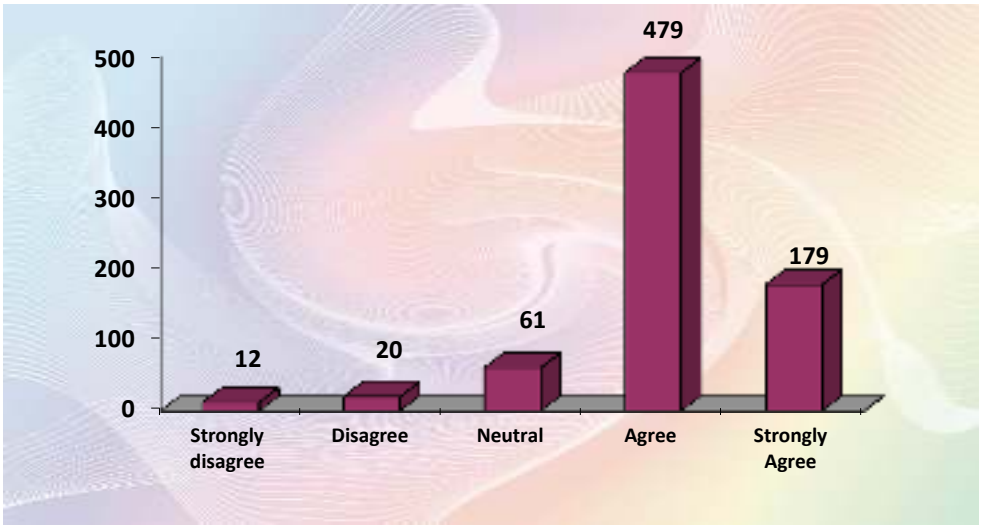
Rationale: The sale proceeds of the milk supplied to the dairy or to any other agency is received by the dairy farmers at fortnightly or monthly interval. This meets the liquid cash requirement of the dairy farmer. This is important because for the principal agricultural activity the income generation is seasonal when the crop is harvested. In between the harvesting whatever cash requirement is there can be met through the dairy payments received for dairy activity.. There are number of occasions when cash payment is a must and this requirement can be fulfilled by the dairy payments received at regular interval. The availability of liquid cash has been presented in table 5.38.

Table 5.38: Response to the statement "The dairy activity enables us to have liquid cash for our day to day requirements"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	12	20	61	479	179	750
Percentage	1.6	2.67	8.13	63.87	23.87	100

Source: Field survey data collected

Fig. 5.31: Response to the statement "The dairy activity enables us to have liquid cash for our day to day requirements"



Interpretation

The data presented in the table 5.38 reveals that 87.74% of the respondents agreed or strongly agreed with the statement that dairy activity enables them to have liquid cash for their day to day requirements. Agriculture is a seasonal activity wherein they get money when their produce is harvested. This leads to a cash crunch for the agriculturists which problem is eased out by the dairy activity that make them available hard cash at regular small interval of a fortnight.

By using the following data the researcher has proved the following hypothesis No. H2.: **"Still there is a wide scope to enlarge the dairy activity."**

Statement 1: "Gradually the villagers are increasing their livestock population as the dairy activity is profitable."

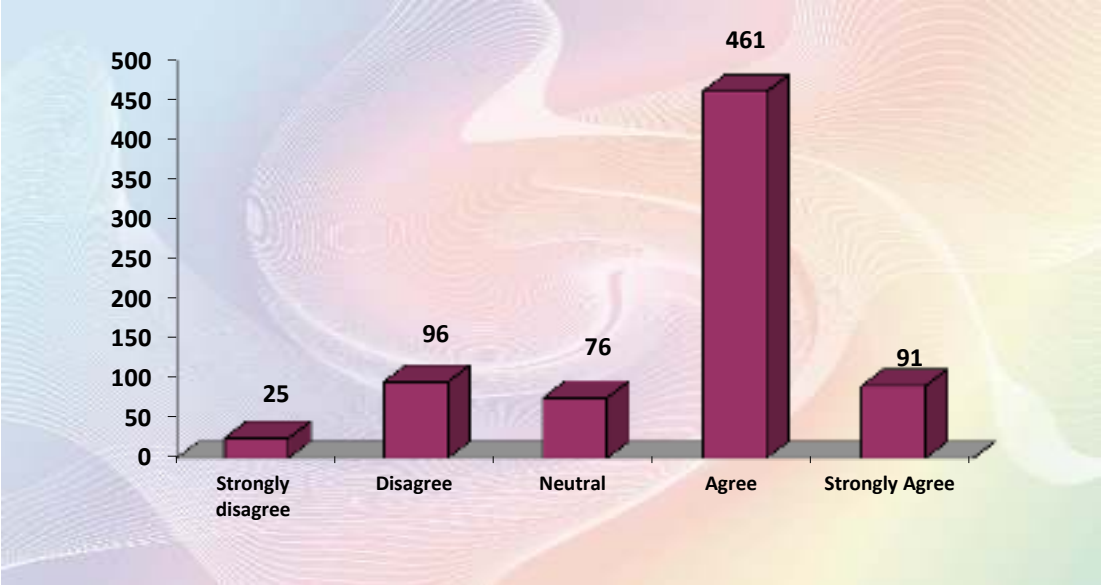
Rationale: Now gradually the dairy farmers are convinced that the dairy activity if run on scientific lines, results in profit. Because of this assured profit many dairy farmers are increasing the livestock as well those who had not entered into dairy activity are also now entering in the dairy activity. Besides, the banks are also convinced about the profitability of the dairy activity and are readily financing the activity which prompts the dairy farmer to go in for the activity.

Table 5.39: Response to the statement "Gradually the villagers are increasing their livestock population as the dairy activity is profitable"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	25	96	76	461	91	750
Percentage	3.33	12.80	10.13	61.47	12.13	100

Source: Field survey data collected

Fig. 5.32: Response to the statement "Gradually the villagers are increasing their livestock population as the dairy activity is profitable"



Interpretation

The data presented in the table 5.39 bring out the fact that 73.6 per cent respondents have either agreed or strongly agreed with the statement that gradually the villagers are increasing their livestock population as the dairy activity is profitable. 10.13% have preferred to be neutral while 16.13% have either disagreed or strongly disagreed with the statement.

Statement 2: "According to me there is very good demand for the milk and milk products"

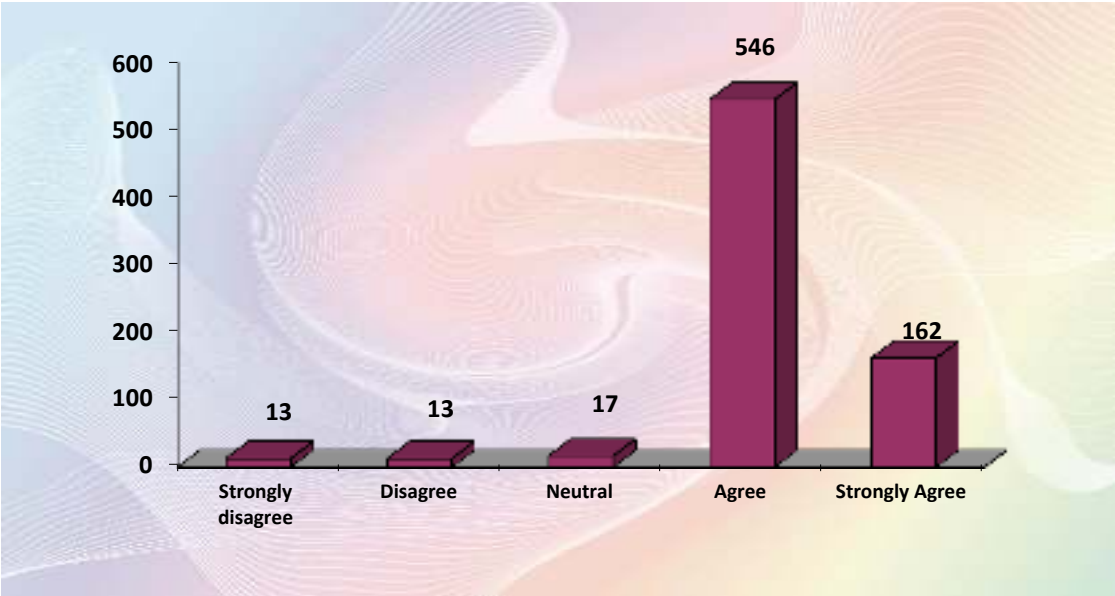
Rationale: The data relating to the per capita consumption of milk is showing increasing trend. Gradually the purchasing power of the common man is increasing. So also, there are number of dairy products that have been invented and marketed. All this has led to increase in the demand for the dairy products. Feedback on the perception of the dairy farmer on this vital issue has been included.

Table 5.40: Response to the statement "According to me there is very good demand for the milk and milk products"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	13	13	17	546	162	750
Percentage	1.73	1.73	2.27	72.80	21.60	100

Source: Field survey data collected

Fig. 5.33: Response to the statement "According to me there is very good demand for the milk and milk products"



Interpretation

The data presented in table 5.41 has revealed that 94.4% of the respondents have either agreed or strongly agreed with the statement that according to them there is a very good demand for milk and milk products. Those who are neutral or disagreed or strongly disagreed together work out to be only 5.27% which is negligible.

Statement 3: "With the increase in population and the purchasing power of the masses there is a greater demand for the value added milk products."

Rationale: Over the years because of the socio economic development in the rural area, and also for the innovations has been taking place in the value added products from the milk. The population is also increasing. The purchasing power of the average

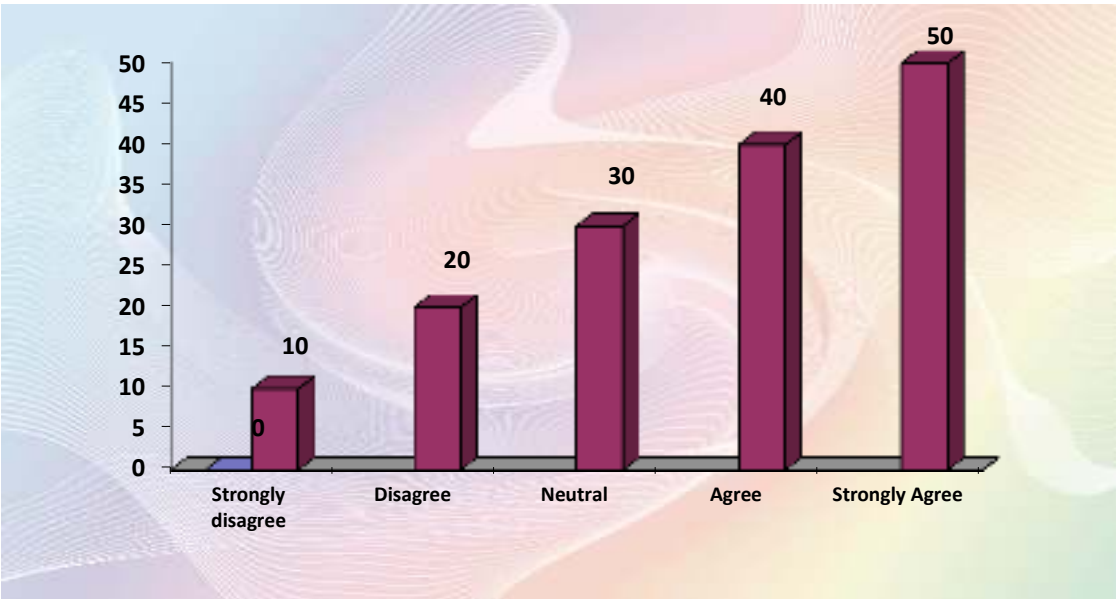
rural family also stands increase and this finds way to buy value added milk products. This has created a huge demand for the dairy products.

Table 5.41: Response to the statement "With the increase in population and the paying capacity of the masses there is a greater demand for the value added milk products."

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	14	10	21	535	171	750
Percentage	1.87	1.33	2.80	71.33	22.80	100

Source: Field survey data collected

Fig. 5.34: Response to the statement "With the increase in population and the paying capacity of the masses there is a greater demand for the value added milk products."



Interpretation

It is revealed from table 5.41 that 94.13% of the respondents have either agreed or strongly agreed with the statement that due to increase in the population as well as the purchasing power of the masses there is greater demand for the value added milk products. Hardly 6% of the respondents have remained neutral, or disagreed or strongly disagreed with the statement.

Statement 4: "Compared to past five years, our own consumption of milk per head has increased."

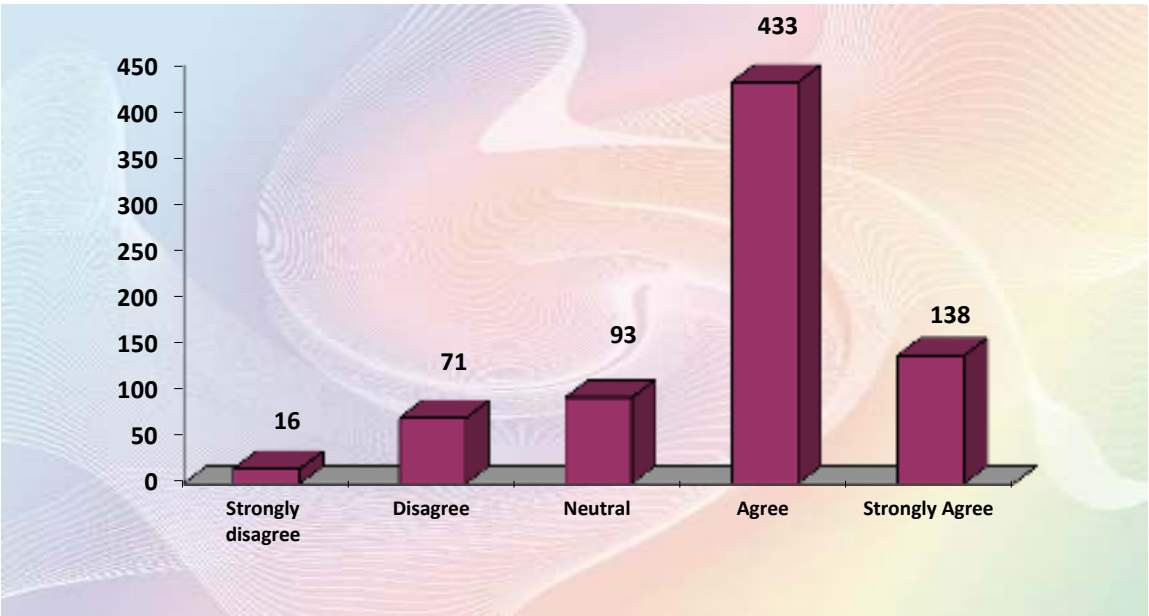
Rationale: The consumption of any product depends upon the increase in the purchasing power. As has been stated earlier, because of the various steps taken by the government to develop the rural and urban area over the past five years the purchasing power of average family has increased. This has also resulted in the increase in the consumption of the per capita milk consumption.

.Table 5.42: Response to the statement "Compared to past five year's our own consumption of milk per head has increased."

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	16	71	93	433	138	750
Percentage	2.13	9.47	12.40	57.73	18.40	100

Source: Field survey data collected

Fig. 5.35: Response to the statement "Compared to past five year's our own consumption of milk per head has increased."



Interpretation

As high as 76.13% of the respondents have vouched that during the past five years their own consumption of milk per head has increased, on the other had only

12.4% have preferred to be neutral while 11.6% of the respondents have either disagreed or strongly disagreed with the statement.

Statement 5: "In the urban area there is scope for supplying quality milk for which the people are willing to pay higher prices"

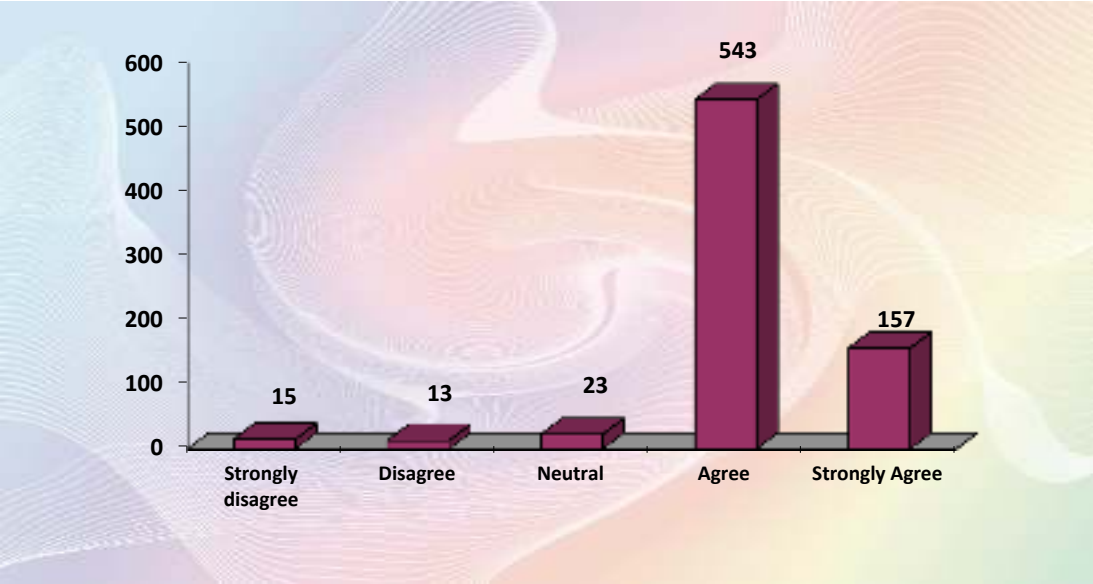
Rationale: In the urban and metropolitan area majority of the earning members are from the organized sector. This organized sector through their trade organizations (unions) at periodical interval press for the wage increase and compel the managements to accede to their demand. This way there is a regular wage increase. In this manner the salaried class gets pay hikes and their purchasing power increases at periodical interval. Besides, the salary increase is also tied up with the cost of living index and as the commodity prices sour high the employees get increase in their dearness allowance at pre-decided periodical intervals. Therefore, this salaried class particularly higher middle class is willing to pay better price for the high quality of the milk supplied to them. Therefore, there is scope for production of high quality of milk and the milk products.

Table 5.43: Response to the statement "In the urban area there is scope for supplying quality milk for which the people are willing to pay higher prices"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	15	13	23	543	157	750
Percentage	2	1.73	3.07	72.40	20.93	100

Source: Field survey data collected

Fig. 5.36: Response to the statement "In the urban area there is scope for supplying quality milk for which the people are willing to pay higher prices"



Interpretation

93.33% of the respondents have agreed with the statement that in the urban area there is scope for supply good quality milk for which the people are willing to pay higher prices. The strength of the neutral, disagreed or strongly disagreed is negligible.

Statement 6: "During festival season there is a great demand for the milk and milk products"

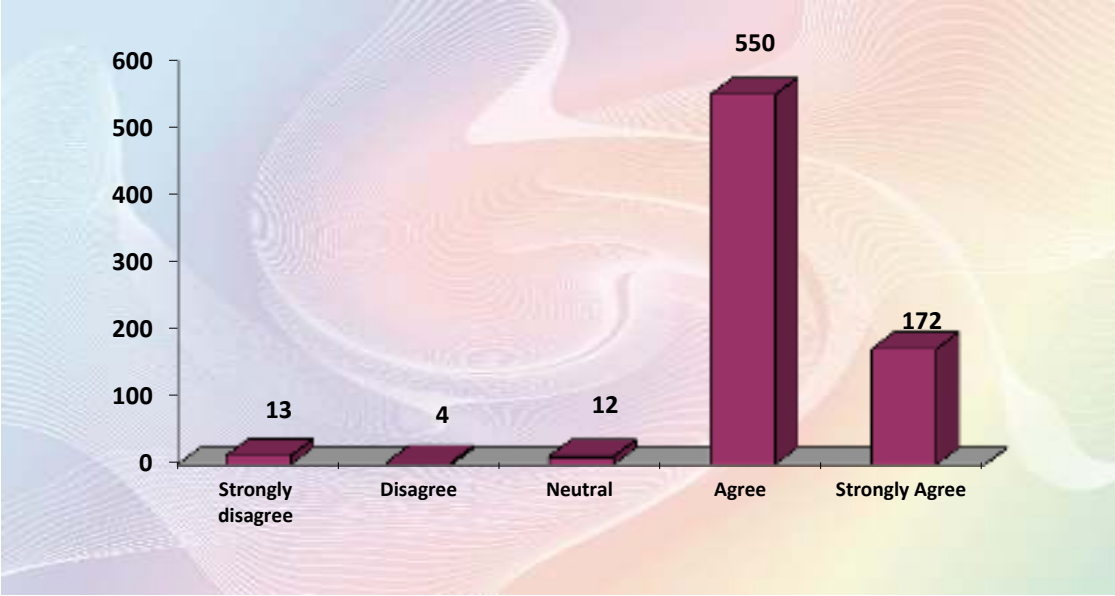
Rationale: In the normal course the demand for milk and milk products shows increasing trend during the festive seasons. Over the years the number of employees in the organized sector is increasing. Because of the better communication systems, now the cities are becoming cosmopolitan. Youth from different States are seeking employment in different states. Along with them they also bring demand for the new products. E.g. various new flavours in Ice creams, Rasmalai, which was originally a Bengal sweet is now available all over India. Therefore, during the festive seasons there is good demand for the milk products. This aspect has also been studied during the research work and presented in table 5.44.

Table 5.44: Response to the statement "During festival season there is a great demand for the milk and milk products"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	13	4	12	550	172	750
Percentage	1.73	0.53	1.60	73.33	22.93	100

Source: Field survey data collected

Fig. 5.37: Response to the statement "During festival season there is a great demand for the milk and milk products"



Interpretation

The data presented in the table 5.44 reveals that highest percentage of 96.26 of the respondents have either agreed or strongly agreed with the statement that during the festive seasons there is a greater demand for the milk and the milk products.

Statement 7: "If we manage the dairy commercially, the activity results in reasonable profit."

Rationale: Any economic activity has to be run on the commercial basis i.e. there should be proper maintenance of accounts, cost consciousness in every decision and action, will certainly lead to profit. Development of proper management information system in any organization helps the management to take decisions on scientific lines.

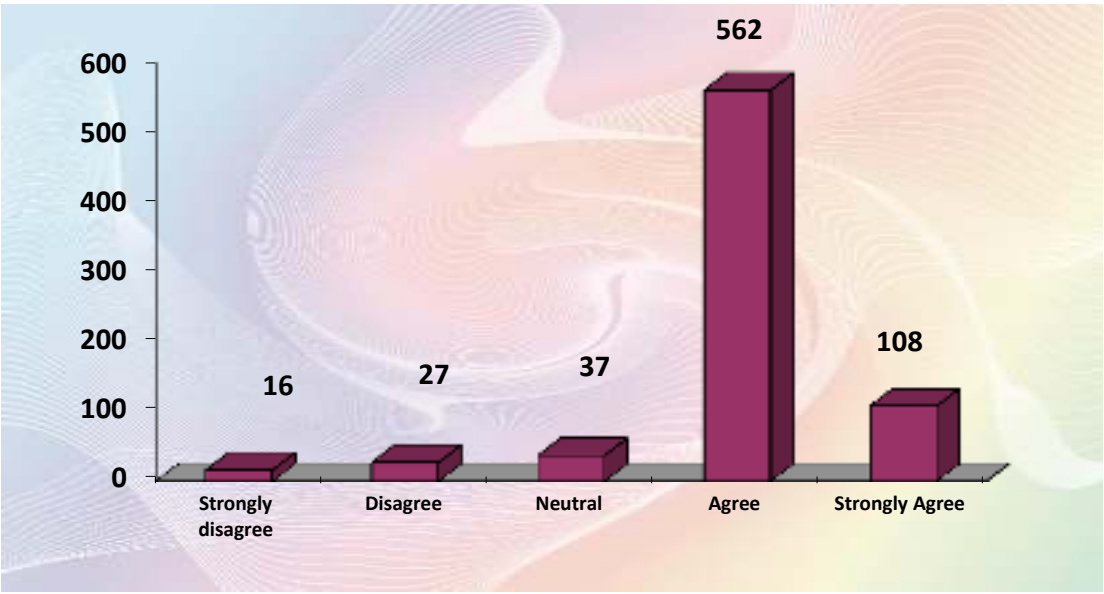
The bye products of the activity should also needs to be processed if required and sold or consumed. Even the captive consumption of the milk should also be taken into account properly. If healthcare is attended timely it helps the dairy farmer to get higher productivity also. Apparently at times the points appear to be trivial but its overall impact on the income generation is considerable. Therefore, the researcher wanted to have feedback from the dairy farmers as to what they feel about the profitability of the dairy activity.

Table 5.45: Response to the statement "If we manage the dairy commercially, the activity results in reasonable profit."

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	16	27	37	562	108	750
Percentage	2.13	3.60	4.93	74.93	14.40	100

Source: Field survey data collected

Fig. 5.38: Response to the statement "If we manage the dairy commercially, the activity results in reasonable profit."



Interpretation

It is the first and foremost requirement of any business that it should be managed commercially and the dairy activity is not an exception to it. As high as 89.33% of the respondents have either agreed or strongly agreed with the statement that if the dairy activity is managed commercially it fetches reasonable profit. Only 4.93% of the respondents remained neutral while 5.73% of the respondents have either disagreed or strongly disagreed with the statement.

Statement 8: "The dairy activity in our family is being managed by the female members from the family."

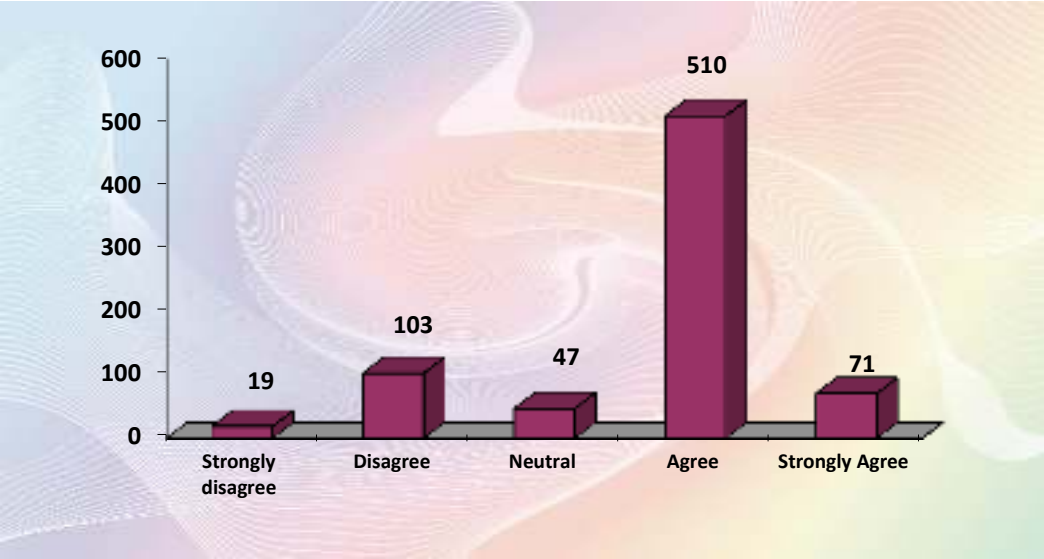
Rationale: In the traditional agriculture families women take an active part in the agricultural activities and help their better half. So far as dairy activity is concerned usually the male members in the family procure the livestock and the day to day maintenance of the livestock is usually being looked after by the female members in the family. They feed and water the livestock, clean the livestock house, and milk the cows and even to a certain extent supply the milk to the dairy or the private buyers. Thus major part of the maintenance activity is being attended to by the female members of the family. It has also been observed that the female do this work properly without any room for pointing any defect, or deficiency. This feedback had been sought from the dairy farmers to understand the participation by the female members from the agriculturists' families.

Table 5.46: Response to the statement "The dairy activity in our family is being managed by the female members from the family"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	19	103	47	510	71	750
Percentage	2.53	13.73	6.27	68.00	9.47	100

Source: Field survey data collected

Fig. 5.39: Response to the statement "The dairy activity in our family is being managed by the female members from the family"



Interpretation

It is revealed that the dairy activity in the family is being managed by the female members in the family. This view has been confirmed by 77.47% of the respondents. 6.27% respondents preferred to be neutral. Only 16.26% of the respondents have either disagreed or strongly disagreed with the statement.

Statement 9: "Now obtaining a loan for the dairy activity is hassle free and at relatively low rates"

Rationale: Ever since the nationalization of the private sector banks in India in 1964, the Government of India has directed the banks to give priority to certain neglected sectors of economy. Agriculture and activity allied to agriculture were one of those sectors. These sectors were known as Priority Sector Advances. Priority sector means priority in the matter of allocation of credit as well as the same was extended on soft terms i.e. rates of interest were relatively less and the repayment period is also spread over marginally longer period, providing gestation period wherever necessary. Therefore, dairy activity is forming part of activity allied to agriculture and hence is in the priority sector and the government has also given physical and financial targets to be achieved by every bank in each district and in each Taluka. This is through the Annual District Credit Plan prepared for every district.

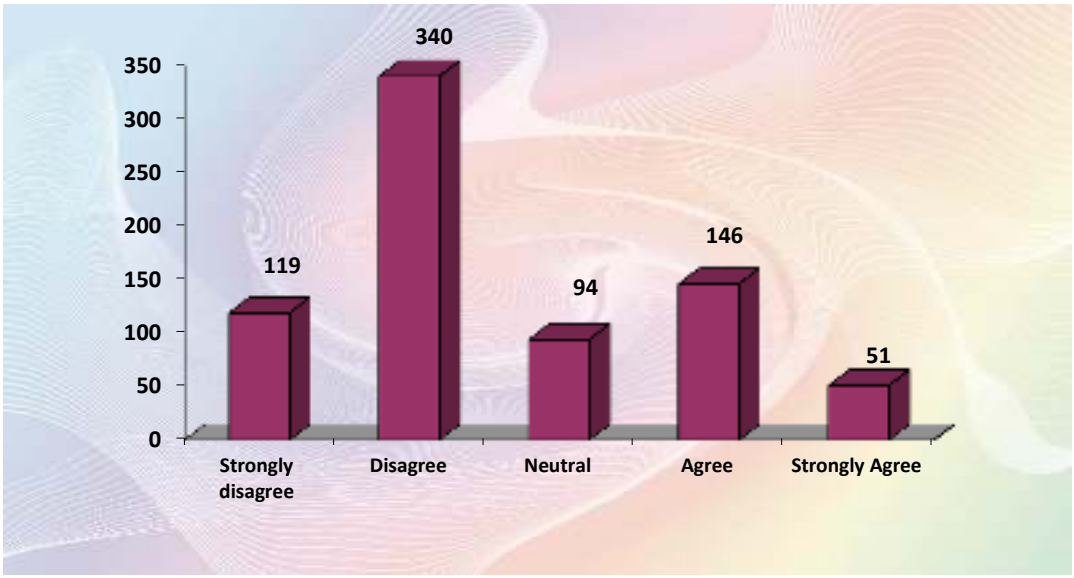
This has eased out raising hassle free bank loan and at low rate. The feedback in this regard has also been sought to ascertain grass root reality.

Table 5.47: Response to the statement "Now obtaining a loan for the dairy activity is hassle free and at relatively low rates"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	119	340	94	146	51	750
Percentage	15.9	45.33	12.53	19.47	6.80	100

Source: Field survey data collected

Fig. 5.40: Response to the statement "Now obtaining a loan for the dairy activity is hassle free and at relatively low rates"



Interpretation

Here again the response received is worth remarkable. Hardly 26.27% of the respondents have either agreed or strongly agreed with the statement. It means the majority of the respondents have agreed or strongly disagreed with the statement. The number in percentage terms works out to as high as 61.23%. Thus, there is a strong need to address this issue with all seriousness.

Statement 10: "I intend to purchase cattle for enlarging the size of my dairy farm."

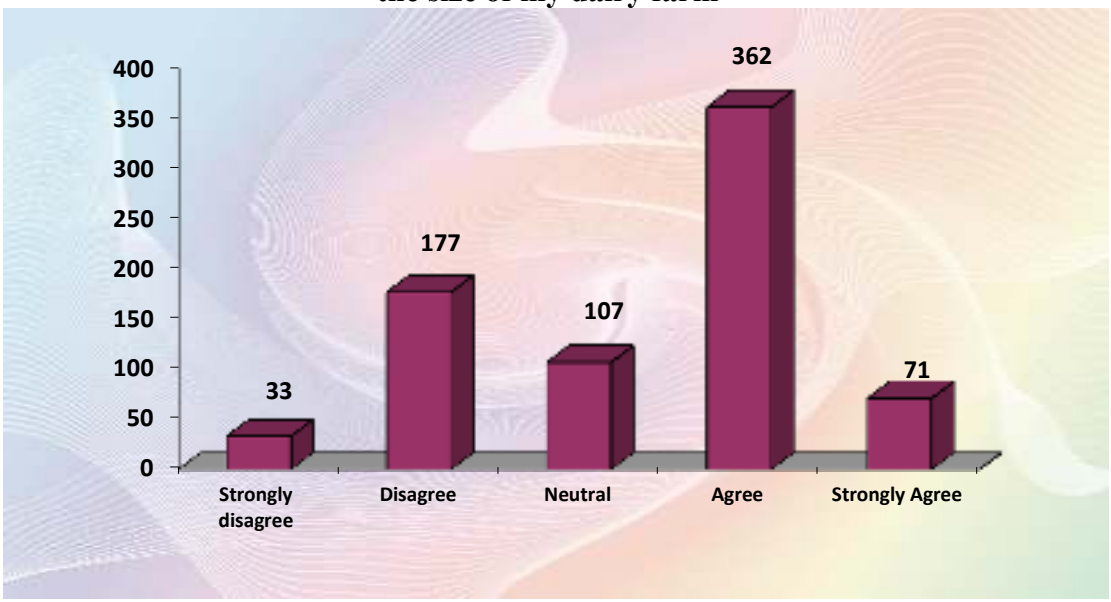
Rationale: I was already been seen that if the dairy activity is carried on commercial basis there is no doubt that it is profitable. When the activity results in profit naturally the entrepreneur is willing to expand his business. Therefore, in order ascertain the mindset of the dairy farmers whether they are willing to plough back the profit i.e. willing to retain a part of the profit in the business or otherwise. If the size of the livestock is increased, naturally, there will be additional income generation for the dairy farmer. This statement was included to find out the mindset of the dairy farmers on increasing the size of the livestock.

Table 5.48: Response to the statement "I intend to purchase cattle for enlarging the size of my dairy farm"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	33	177	107	362	71	750
Percentage	4.4	23.60	14.27	48.27	9.47	100

Source: Field survey data collected

Fig. 5.41: Response to the statement "I intend to purchase cattle for enlarging the size of my dairy farm"



Interpretation

It has been revealed from the field data analysis that 57.74% of the respondents have expressed that they have intention to expand their dairy activity by purchasing additional cattle.

By using the following data the researcher has proved the following objective.

"The cooperative dairy organizations are playing a key role to financially strengthen the rural farmers."

Statement 1: "As I am a member of the local milk producer's coop. society I get guidance from the society for maintaining my dairy animals"

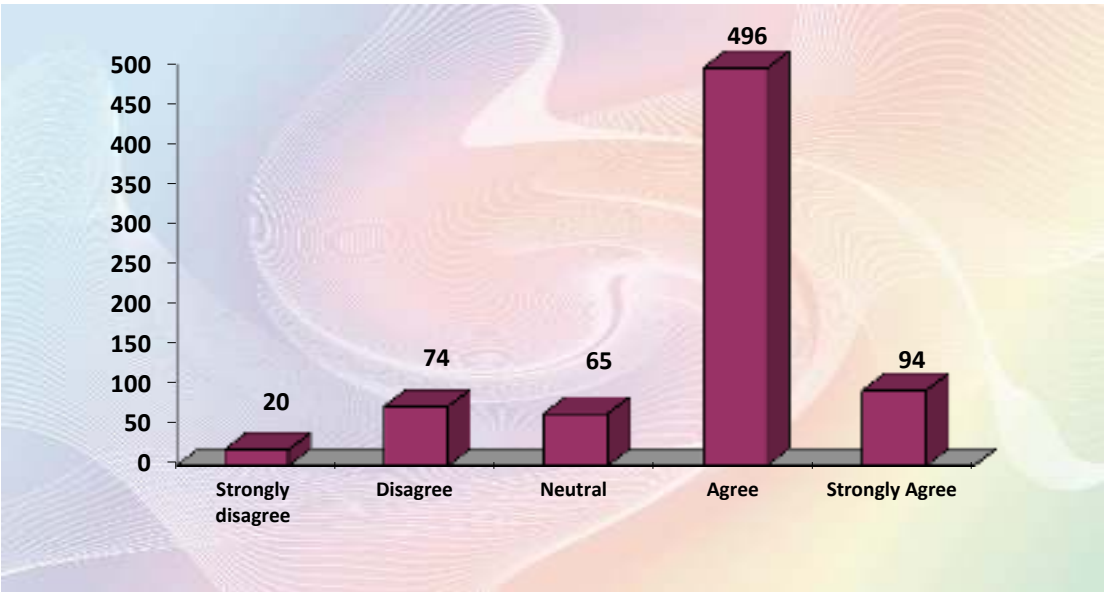
Rationale: Now the dairy societies are assuming developmental role and are organizing training programmes, providing guidance to the dairy farmers. The societies take the help of the Animal Husbandry department of the Govt. of Maharashtra and also from the District Dairy Unions (in the instant case Katraj Dairy) for this purpose. At times successful dairy farmers are also invited for sharing their experiences with the other dairy farmers. Through this endeviour of the Dairy Societies, the dairy farmers who are the members of the society have been benefited. This is the developmental role the dairy societies are performing with the sole objective of increasing their milk collection. The statement was included to ascertain the grass root reality and presented in table 5.49..

Table 5.49: Response to the statement "As I am a member of the local milk producer's coop. society I get guidance from the society for maintaining my dairy animals"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	20	74	65	496	94	750
Percentage	2.67	9.87	8.67	66.13	12.53	100

Source: Field survey data collected

Fig. 5.42: Response to the statement "As I am a member of the local milk producer's coop. society I get guidance from the society for maintaining my dairy animals"



Interpretation

The data in table 5.49 shows that 78.66% of the respondents have either agreed or strongly agreed with the statement that being member of the dairy society they get guidance from the society for maintaining their dairy animals. 8.57% of the respondents have preferred to be neutral while 12.54% have either disagreed or strongly disagreed with the statement.

Statement 2: "Our society managing committee understands our problems in right perspective and extends every help to us."

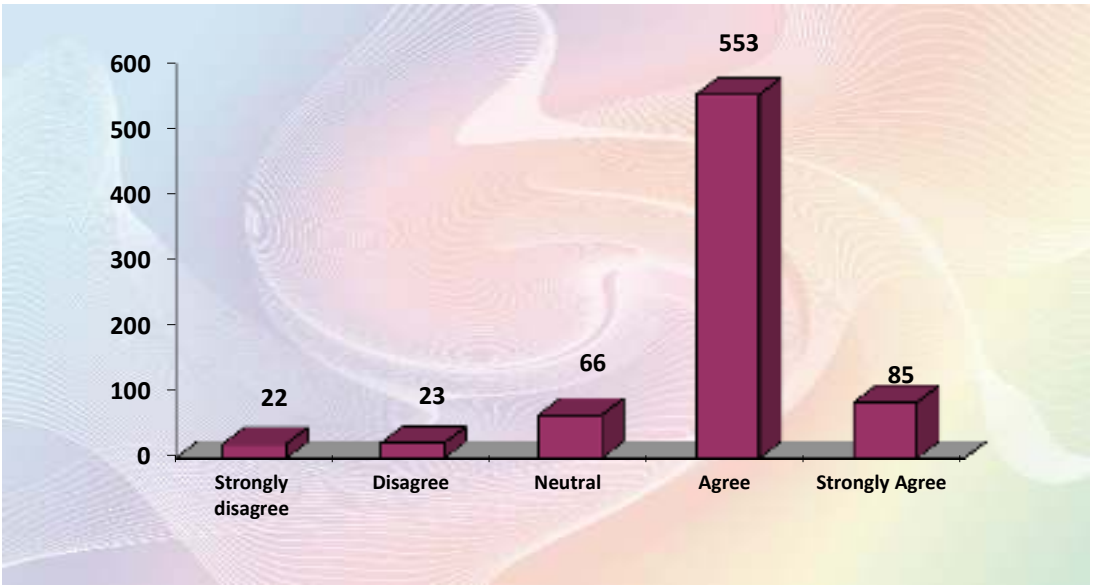
Rationale: The dairy societies are managed by the managing committees elected by the members of the societies to look after the day to day functioning of the society. This is a decision making body of the society. Whenever, any member faces any problem / difficulty, naturally he/she approaches the secretary of the society and narrates to him the difficulties faced by him or her. Through this feedback the researcher wanted to find out whether the managing committee understands their problems in right perspective and provide assistance whenever necessary.

Table 5.50: Response to the statement "Our society managing committee understands our problems in right perspective and extends every help to us"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	22	23	66	553	85	750
Percentage	2.93	3.07	8.80	73.73	11.33	100

Source: Field survey data collected

Fig. 5.43: Response to the statement "Our society managing committee understands our problems in right perspective and extends every help to us"



Interpretation

The highest percentage of 85.06% respondents have either agreed or strongly agreed with the statement that their society's managing committee understands their problems in the right perspective and extends all help to solve their problems if any. On the other hand only 8.8% of the respondents preferred to be neutral while 6% of the respondents have either disagreed or strongly disagreed.

Statement 3: "The society has arrangements for supply of cattle feed, medicines required for the livestock."

Rationale: The ultimate goal of the Dairy society is to increase the milk collection and to earn more surpluses. One of the area in which the dairy society can help the

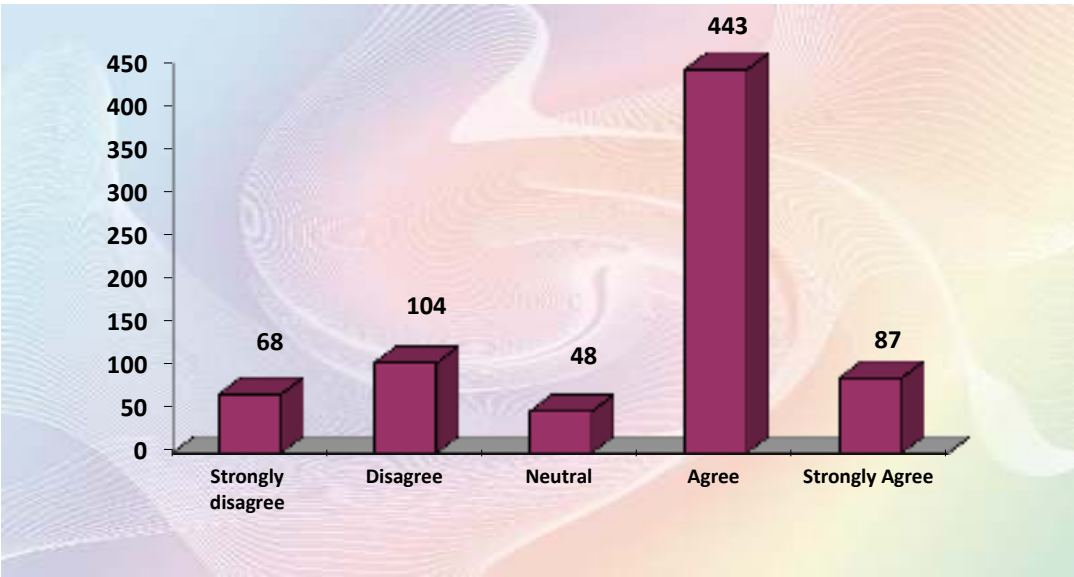
dairy farmer is to make provision for the quality feed for the cattle at reasonable prices. Similarly the society also keeps the stock of routinely required medicines and supplies it to the dairy farmers. In this manner the society supports the dairy activity of the dairy farmer. The dairy society can make arrangements to either produce of its own or may buy good quality cattle feed in bulk and earn trade discount and earn more income. The feedback received lays focus on the support activities undertaken by the dairy societies.

Table 5.51: Response to the statement "The society has arrangements for supply of cattle feed, medicines required for the livestock."

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	68	104	48	443	87	750
Percentage	9.07	13.87	6.40	59.07	11.60	100

Source: Field survey data collected

Fig. 5.44: Response to the statement "The society has arrangements for supply of cattle feed, medicines required for the livestock."



Interpretation

The data reveals that 70.67% of the respondents have either agreed or strongly agreed with the statement that their society has arrangements to supply cattle feed,

medicines required for the livestock. 6.40% respondents have preferred to be neutral while 22.94% respondents have either disagreed or strongly disagreed.

Statement 4: "I am of the view that our society should deduct its loan installment from our periodical sale proceeds of milk on prorate basis so that we do not have tension at the end of the year."

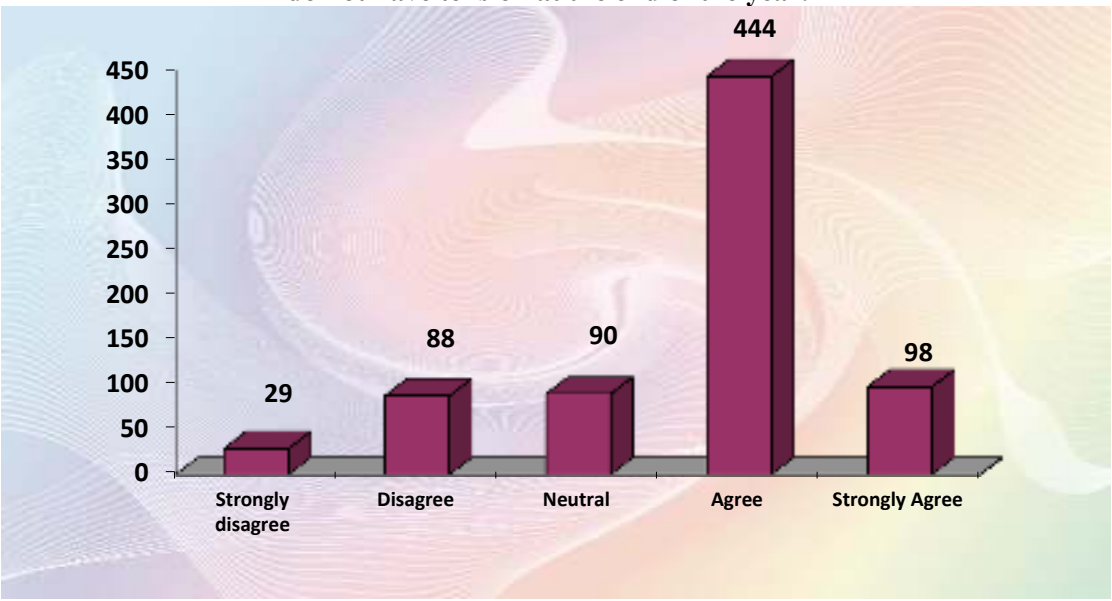
Rationale: Normally barring the District Central Coop. Bank Ltd. all other banks follow the system of seeking deduction from the payment of the sale proceeds as and when those are effected. In Pune D.C.C. Bank Ltd. the period of repayment of the dairy loan has been fixed on 30th June every year. It is a usual tendency of the human being that if he has fresh money he may have several options and at the time of repayment of the yearly loan installment he may not have money with him. So also if the proportionate loan installment is paid at monthly / fortnightly interval from the milk sale proceeds due to the system of interest calculation by the banks (interest on reducing balance) naturally the incidence of interest will also be less. This system is also encouraged by the financing banks as they have greater control over the recovery of the bank loan. Because of availability of forward recovery linkage banks also feel comfortable.

Table 5.52: Response to the statement "I am of the view that our society should deduct its loan installment from our periodical sale proceeds of milk on prorate basis so that we do not have tension at the end of the year."

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	29	88	90	444	98	750
Percentage	3.87	11.73	12.00	59.20	13.07	100

Source: Field survey data collected

Fig. 5.45: Response to the statement "I am of the view that our society should deduct its loan installment from our periodical sale proceeds of milk on prorate basis so that we do not have tension at the end of the year."



Interpretation

The data presented in table 5.52 shows that 72.27% of the respondents have either agreed or strongly agreed with the statement that their society should deduct their loan installment for their fortnightly sale proceeds of the milk supplied and pay it directly to the financing bank. According to them this will relieve them from the tension of the loan repayment at the end of the year. Only 12% opted to be neutral, while 15.6% of the respondents have either disagreed or strongly disagreed with the statement.

Statement 5: "Payment of regular installments from the sales proceeds of milk regularly will also reduce the interest burden"

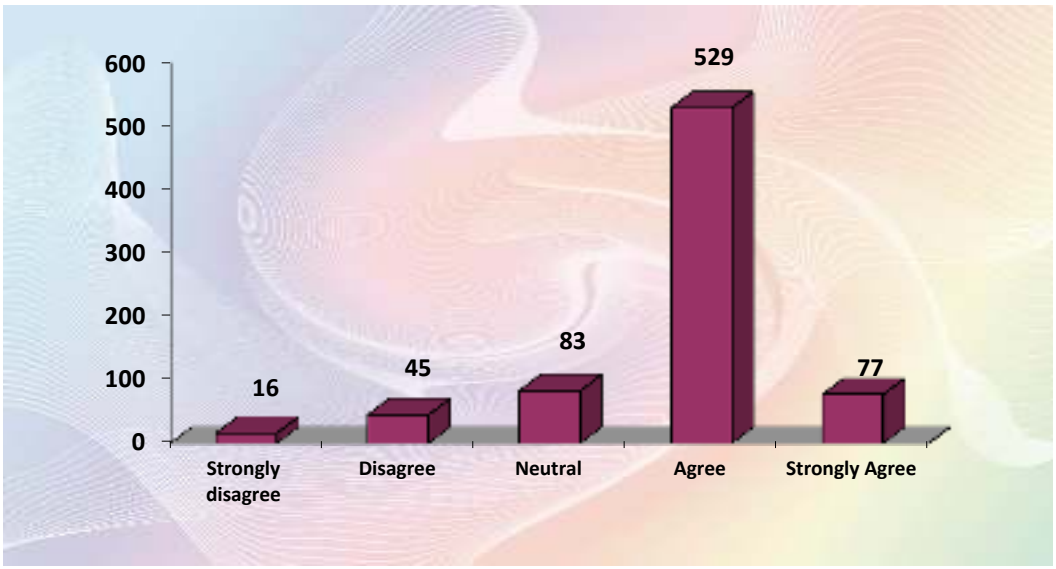
Rationale: Normally banks charge interest on the reducing balance basis so that if the installments are paid regularly the interest burden will also get reduced. This is because by every recovery the outstanding balance will be reduced. So also if there is a delay in payment of installment for any reason the banks also charge penal interest to discipline the borrower. The feedback on this count was sought to understand the perception of the dairy farmer.

Table 5.53 : Response to the statement "Payment of regular installments from the sales proceeds of milk regularly will also reduce the interest burden"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	16	45	83	529	77	750
Percentage	2.13	6.00	11.07	70.53	10.27	100

Source: Field survey data collected

Fig. 5.46: Response to the statement "Payment of regular installments from the sales proceeds of milk regularly will also reduce the interest burden"



Interpretation

The data presented in table 5.53 shows that 80.80% respondents have either agreed or strongly agreed with the statement that payment regular loan installment from the sale proceeds of milk from time to time will also give them relief in payment of interest. Only 11.07 % respondents opted to be neutral, were 8.13% respondents have either disagreed or strongly disagreed with the statement.

Statement 6: "I feel that the society staff should assist us in putting up our claim with the insurance company and for early settlement of our claim"

Rationale: Whenever there is an occasion to put up a claim with the insurance company the insured has to fill up the claim form. The dairy farmer finds it difficult to fill it up as it is slightly complicated. For this purpose if the society gets its staff

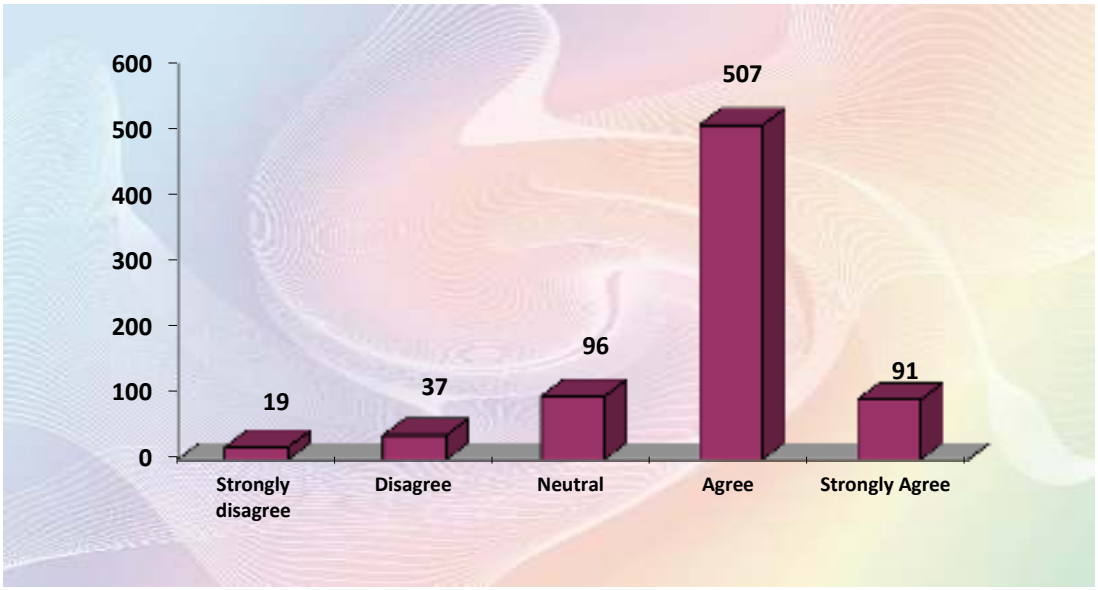
trained in filling up the claim form and assist the dairy farmer in receiving early claim settlement will be little bit easy. Therefore, the dairy farmers expect that the society staff should assist them to fill up the insurance claim form and to follow it up with the insurance company till the claim is settled. To ascertain the ground reality in this regard this statement has been included in the questionnaire.

Table 5.54: Response to the statement "I feel that the society staff should assist us in putting up our claim with the insurance company for early settlement of our claim"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	19	37	96	507	91	750
Percentage	2.53	4.93	12.80	67.60	12.13	100

Source: Field survey data collected

Fig. 5.47: Response to the statement "I feel that the society staff should assist us in putting up our claim with the insurance company for early settlement of our claim"



Interpretation

The data shows that as high 79.73% of the respondents feel that the society staff should extend assistance in putting up their insurance claim and for its early settlement. The rest of the members have remained neutral, disagreed or strongly disagreed.

Statement 7: "There should be uninterrupted power supply to our village for smooth running of the dairy activity"

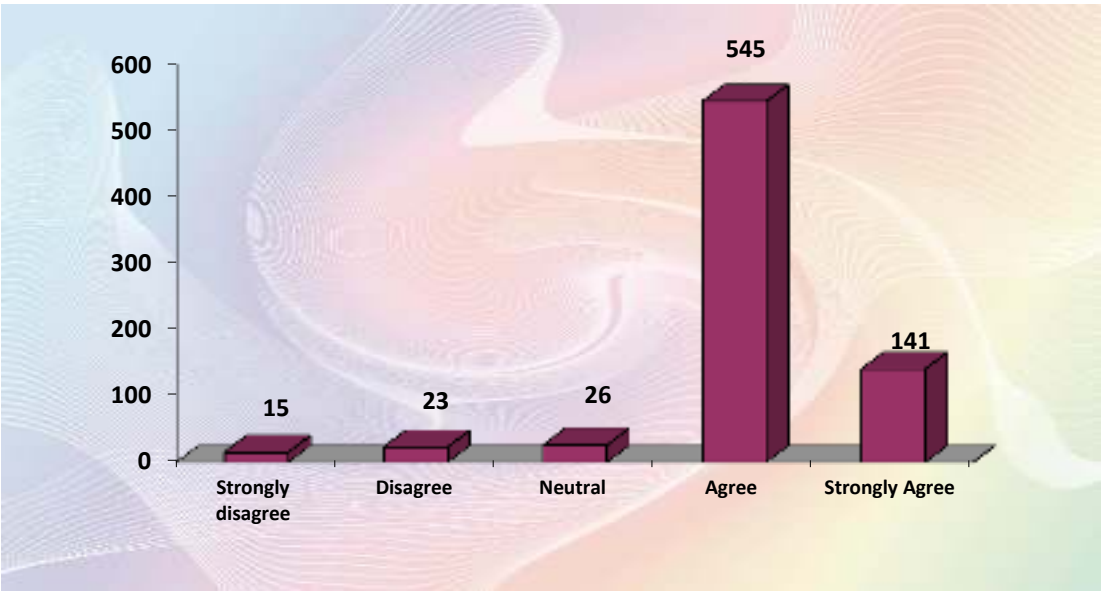
Rationale: Milk and milk products are perishable. Those are required to be kept in the refrigerated condition. For refrigeration continuous electricity supply is a must. Maharashtra is short of electricity supply and therefore, the villages do not get continuous power supply. There is a heavy dose of power cut. Only if there is uninterrupted power supply the dairy activity can be run smoothly.

Table 5.55: Response to the statement "There should be uninterrupted power supply to our village for smooth running of the dairy activity"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	15	23	26	545	141	750
Percentage	2	3.07	3.47	72.67	18.80	100

Source: Field survey data collected

Fig. 5.48: Response to the statement "There should be uninterrupted power supply to our village for smooth running of the dairy activity"



Interpretation

The highest percentage 91.47 respondents have either agreed or strongly agreed with the statement that there should be uninterrupted power supply to their villages for smooth running of their dairy activity. The expectation is quite genuine and reasonable.

Statement 8: "Until I am made aware as to how the final rate of our milk supply is arrived at, I was carrying an impression that I am not getting competitive rate"

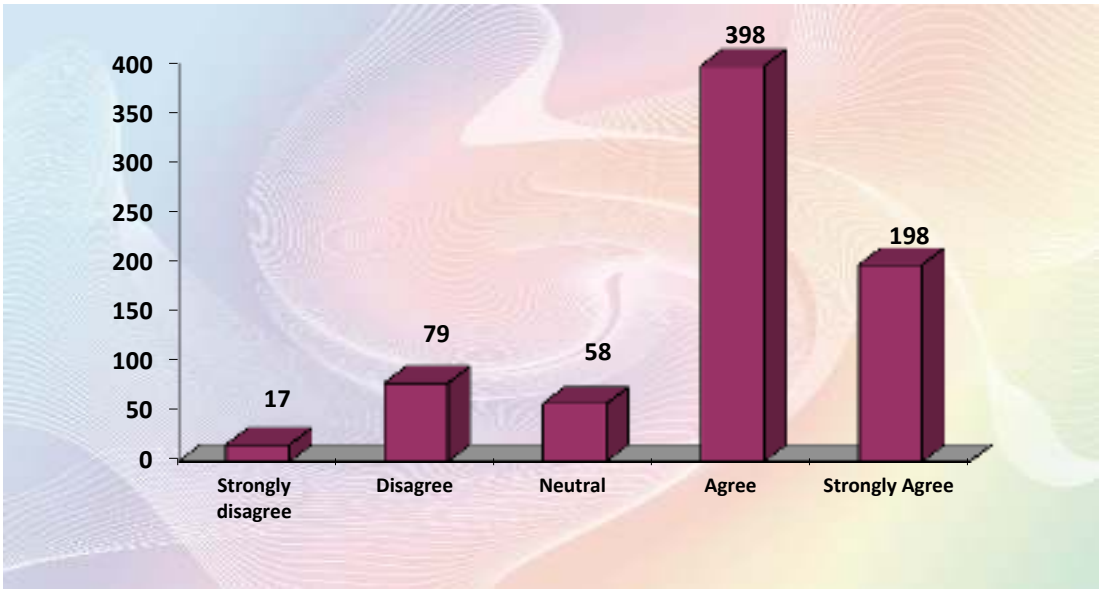
Rationale: Broadly it was observed that the dairy farmers are unaware of the process of deciding the rate for the milk. As a result of this state, the general impression is that they do not get competitive rate. Therefore, if the Dist. Dairy Union educates the dairy farmers on the factors and the process of deciding the milk rate, the dairy farmers will understand the reality in this respect. This will enhance the confidence of the dairy society. Even within the rate structure he will be able to try to satisfy the norms for higher rate and earn more.

Table 5.56: Response to the statement "Until I am made aware as to how the final rate of our milk supply is arrived at, I was carrying an impression that I am not getting competitive rate"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	17	79	58	398	198	750
Percentage	2.27	10.53	7.73	53.07	26.40	100

Source: Field survey data collected

Fig. 5.49: Response to the statement "Until I am made aware as to how the final rate of our milk supply is arrived at, I was carrying an impression that I am not getting competitive rate"



Interpretation

As high as 79.47% of the respondents have either agreed or strongly agreed with the statement that they are getting competitive rates for the milk supplied by them to the dairy society. At present the dairy farmers supply the milk to the dairy societies are getting better rate even as compared to the private dairy organizations. Besides, the rate given for the milk, the dairy farmers supplying the milk to the dairy society, they also get at the end of the year 'price difference' which adds to their income.

Statement 9: "The society should arrange to inform the members the Govt. Schemes in operation relating to the dairy activity so that we can take benefit of the scheme"

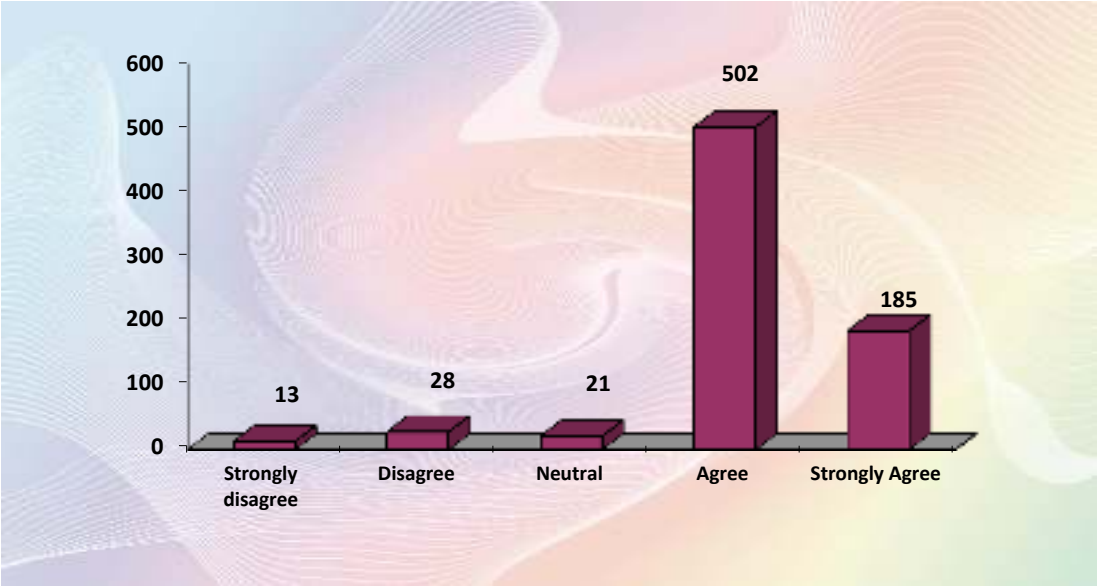
Rationale: As the dairy activity provides supplementary source of income generation to the agriculturists the government draws out various schemes for supporting the dairy activity in a variety of ways. However, the villagers are not aware of these schemes as a result they cannot take the benefit of it. Therefore, the dairy society should take lead in arranging dairy farmers meetings periodically and apprises them of the various govt. schemes for them. This feedback will through light on the grass root reality.

Table 5.57: Response to the statement "The society should arrange to inform the members the govt. schemes in operation relating to the dairy activity so that we can take benefit of the scheme"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	13	28	21	502	185	750
Percentage	1.73	3.73	2.80	66.93	24.67	100

Source: Field survey data collected

Fig. 5.50: Response to the statement "The society should arrange to inform the members the govt. schemes in operation relating to the dairy activity so that we can take benefit of the scheme"



Interpretation

The data presented in the table 5.57 shows that 91.6% of the respondents have either agreed or strongly agreed with the statement that the society should arrange to inform the members the various government schemes in operation relating to the dairy activity so that they can take benefit of those schemes. Rest of the respondents has remained neutral, disagreed or strongly disagreed.

Statement 10: "If the livestock feed and the commonly required medicines are made available through the society (enjoying the benefits of bulk buying) it will be a great service to us"

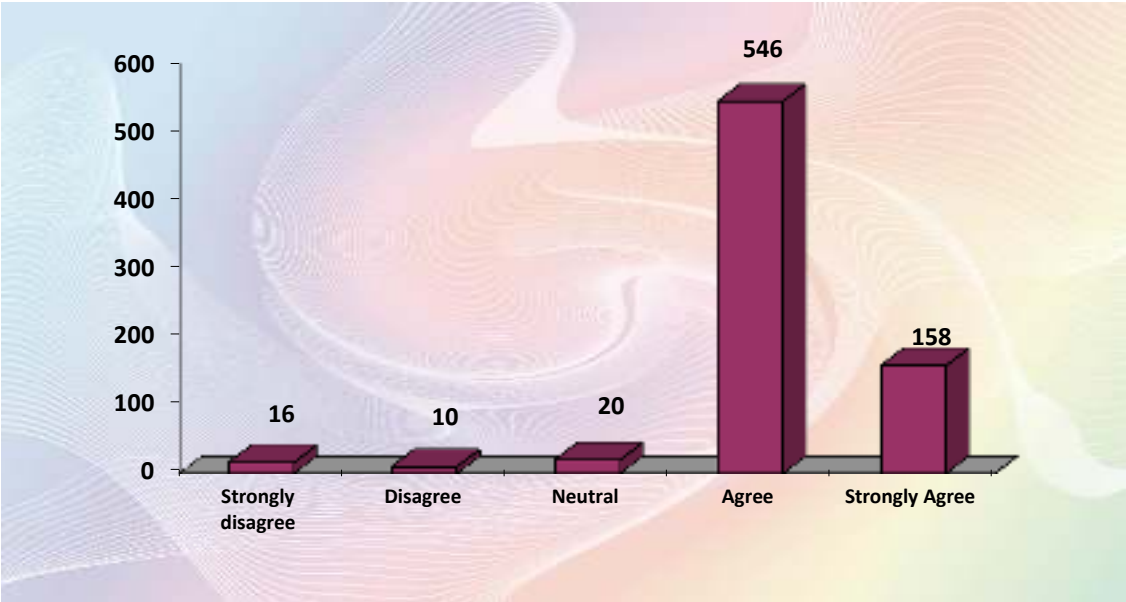
Rationale: At present all the societies are not keeping the stock of cattle feed and the routinely required medicines as a result of which the dairy farmers have to run to the private retailers who charge unreasonable price as well as quality of the feed is not assured. If the dairy society buys it in bulk it will get it at competitive rates and can confirm the quality of the cattle feed. Therefore, the researcher wanted to ascertain the ground reality on this score.

Table 5.58: Response to the statement "If the livestock feed and the commonly required medicines are made available through the society (enjoying the benefits of bulk buying) it will be a great service to us"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	16	10	20	546	158	750
Percentage	2.13	1.33	2.67	72.80	21.07	100

Source: Field survey data collected

Fig. 5.51: Response to the statement "If the livestock feed and the commonly required medicines are made available through the society (enjoying the benefits of bulk buying) it will be a great service to us"



Interpretation

It is seen from the table 5.58 statistics that 93.87% of the respondents have either agreed or strongly agreed with the statement; the dairy society should purchase the cattle feed and the commonly required medicines for the livestock in bulk from the wholesale market and supply it to the members. This will be a great help to the dairy farmers to get cheaper inputs. The rest of the respondents are negligible which account for 6.13%.

Statement 11: "I am aware of the various types of A.I. products"

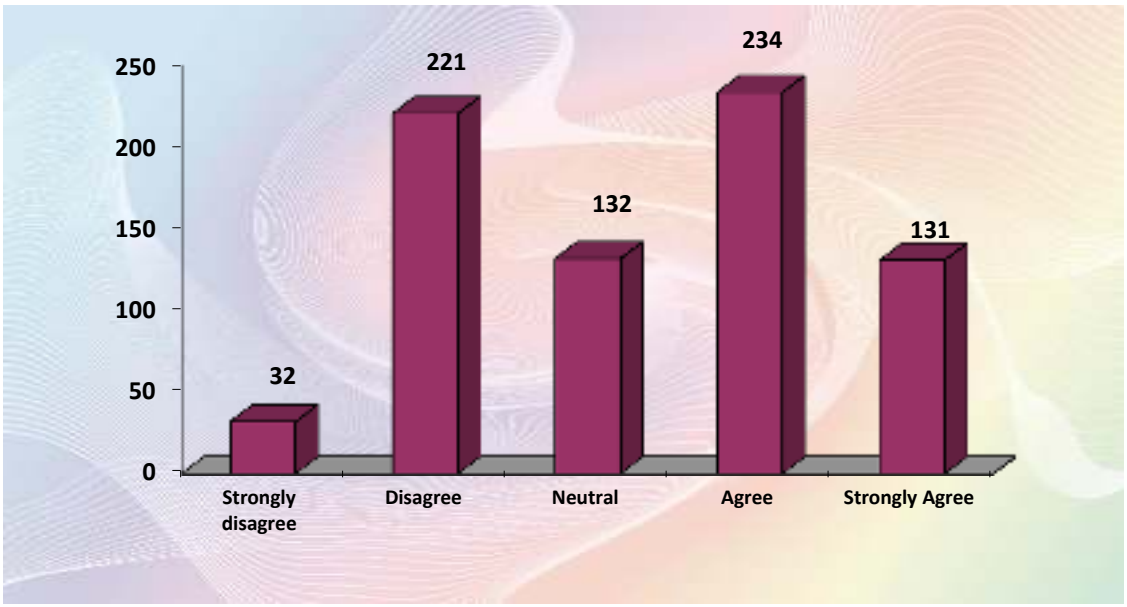
Rationale: There are various types of semen available in the market. Semen of proven quality breed influences the milk production. Unfortunately the dairy farmers are not aware as to which semen is of proven quality. Therefore, the researcher wanted to ascertain the ground reality on this score through this feedback from the dairy farmers which is depicted in table 5.59.

Table 5.59: Response to the statement "I am aware of the various types of A.I. products"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	32	221	132	234	131	750
Percentage	4.27	29.47	17.60	31.20	17.47	100

Source: Field survey data collected

Fig. 5.52: "I am aware of the various types of A.I. products"



Interpretation

The above data reveals that 51.34% of the respondents have stated that they are unaware of the various types of semen available in the market. In the absence of this knowledge whatever semen the veterinary official uses, is given to the cattle.

Statement 12: "I always insist on periodical checkup of my livestock"

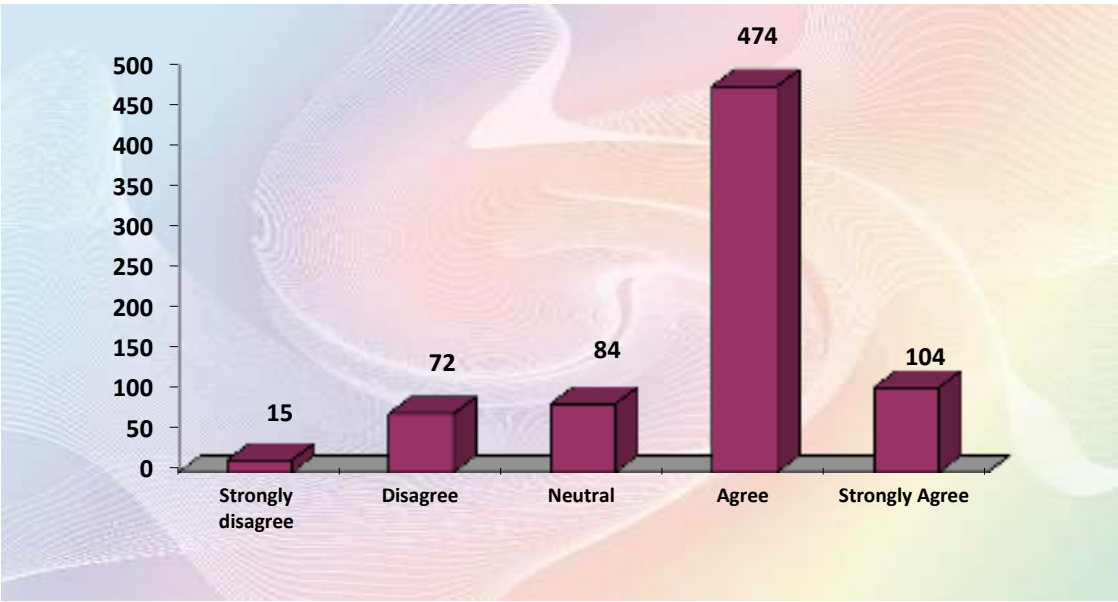
Rationale: In order to have maximum milk output the dairy farmers have to ensure that the livestock's health is good. For this purpose it is always better to have regular health checkup of the livestock by a veterinarian and follow up his advice. This will ensure sound health of the livestock and there will be uninterrupted milk supply. Through this statement the researcher wanted to have feedback as to whether the dairy farmers are availing the services of the veterinarian and take care of their livestock.

Table 5.60: Response to the statement "I always insist on periodical checkup of my livestock"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	15	72	84	474	104	750
Percentage	2.00	9.60	11.20	63.20	13.87	100

Source: Field survey data collected

Fig. 5.53: Response to the statement "I always insist on periodical checkup of my livestock"



Interpretation

The above data shows that 77.07% of the respondents have either agreed or strongly agreed that they always insist on periodical checkup of their livestock.

11.20% respondents opted to be neutral. 11.60% of the respondents have either disagreed or strongly disagreed with the statement.

Statement 13: "I take abundant hygienic precautions while milking the animal as well as while supplying the milk to the society."

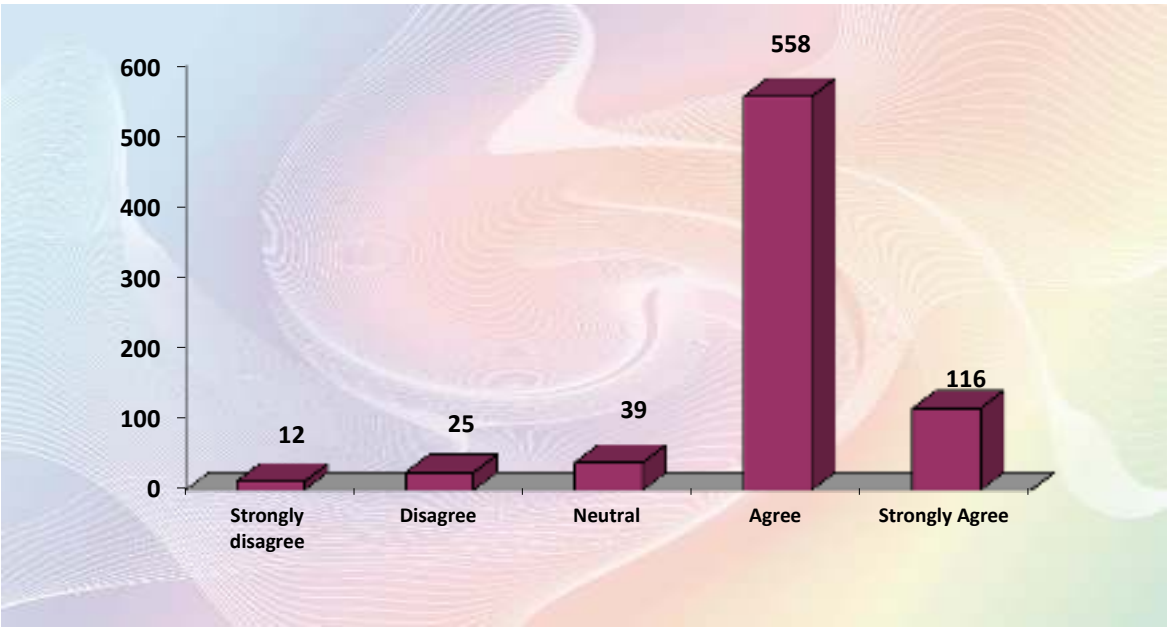
Rationale: Milking the animal and supplying the milk to the dairy society / or a private purchaser are the two stages where the dairy farmer is expected to take abundant hygienic precautions. At the time of milking the udders should be cleaned with water, the pot in which the milk is being collected should be clean etc. And at the time of sending the milk to the supply point it should be promptly sent to the dairy in a thoroughly cleaned kettle or a can so as to ensure that there is no contamination. In fact this should be the routine for the dairy farmer.

Table 5.61: Response to the statement "I take abundant hygienic precautions while milking the animal as well as while supplying the milk to the society."

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	12	25	39	558	116	750
Percentage	1.6	3.33	5.20	74.40	15.47	100

Source: Field survey data collected

Fig. 5.54: Response to the statement "I take abundant hygienic precautions while milking the animal as well as while supplying the milk to the society."



Interpretation

Table 5.60 shows that 89.87% of the respondents have either agreed or strongly agreed with the statement that they take abundant hygienic precautions while milking the animal as well as while supplying the milk to the society. The rest of the respondents revealed, neutral, disagreed or strongly disagreed.

Statement 14: "Our society organizes training programs for the members"

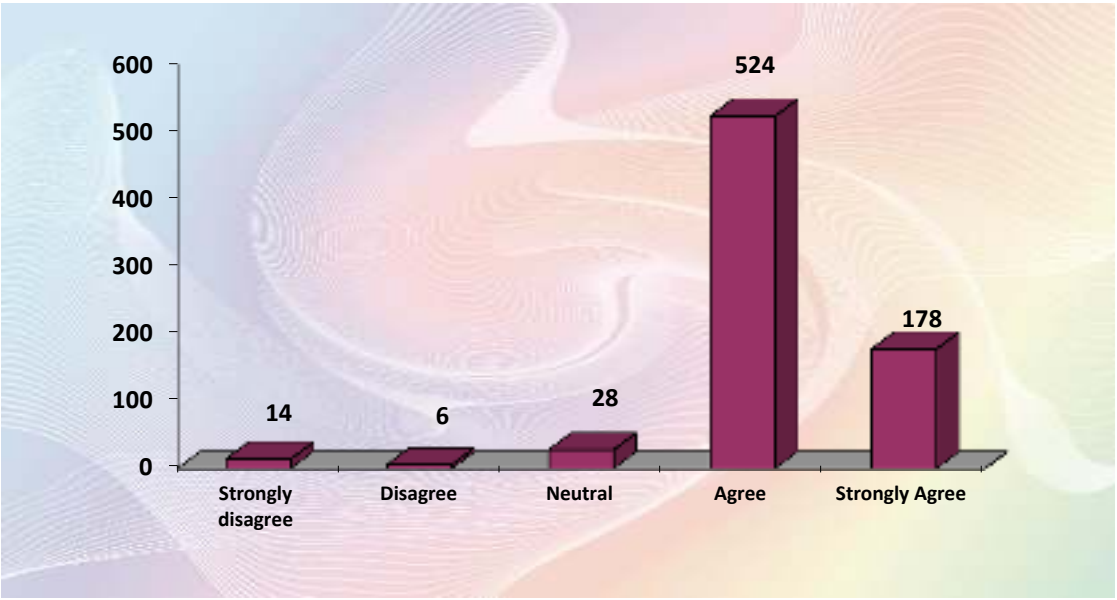
Rationale: It has already been seen that there is a need to educate the dairy farmers on various aspects of dairy in order to have maximum milk output. Some dairy societies organize training programs for the dairy farmers. Even at the cost of repetition this statement has been included making it slightly simpler and to cross check with the earlier response.

Table 5.62: Response to the statement "Our society organizes training programs for the members"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	14	6	28	524	178	750
Percentage	1.87	0.80	3.73	69.87	23.73	100

Source: Field survey data collected

Fig. 5.55: Response to the statement "Our society organizes training programs for the members"



Interpretation

Table 5.62 indicates that 93.6% of the respondents have stated that their society conducts training programs for the members. The rest percentage of respondents is negligible.

Through the following statements the researcher has tested the following objective:

"To study the level of awareness of risks in managing the livestock and the remedial measures being adopted by the dairy farmers/Dairy Cooperative societies"

Statement 1: "To increase the milk production, apart from adding the cattle, there are number of aspects which can increase the milk production"

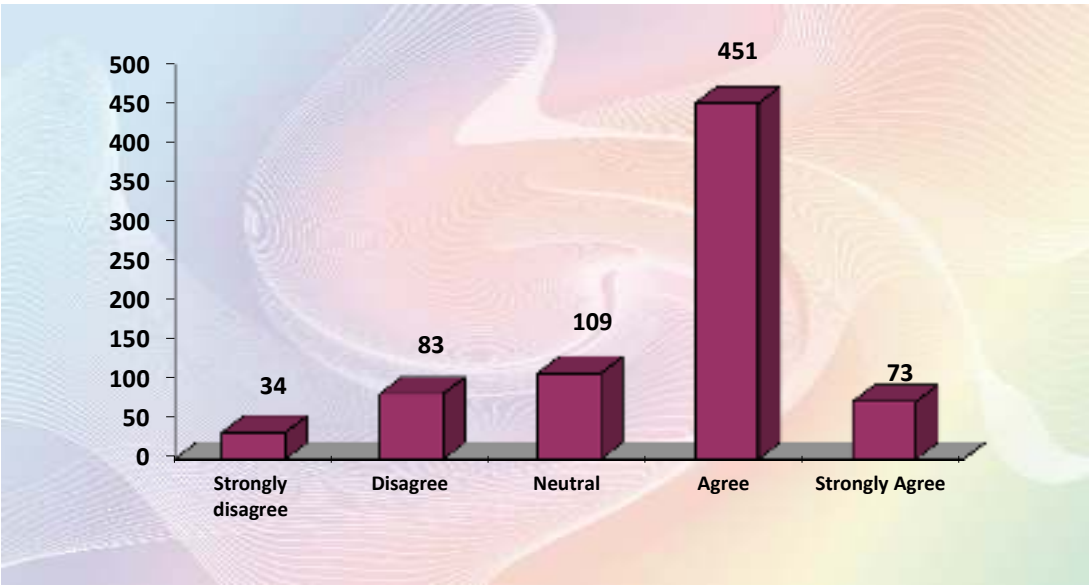
Rationale: Milk production can be increased by adopting number of ways. One is increasing the number of livestock. The other methods include: ensuring good quality cattle feed in right quantity and at the right time, using potable water, ensuring regular health checkup of the livestock, using of semen of high quality breed bullock etc. Through response to this statement the researcher has made sincere effort to get feedback as to what extent the dairy farmers are enlightened about these activities.

Table 5.63 : Response to the statement "To increase the milk production, apart from adding the cattle, there are number of aspects which can increase the milk production"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	34	83	109	451	73	750
Percentage	4.53	11.07	14.53	60.13	9.73	100

Source: Field survey data collected

Fig. 5.56: Response to the statement "To increase the milk production, apart from adding the cattle, there are number of aspects which can increase the milk production"



Interpretation

According to table 5.63 69.86% of the respondents have either agreed or strongly agreed with the statement that apart from adding the cattle, there are number of aspects which can increase the milk production. Only 14.33% respondents opted to be neutral while 15.60% respondents disagreed or strongly disagreed.

Statement 2: "I have earmarked a part of my agricultural land for cultivation of green fodder"

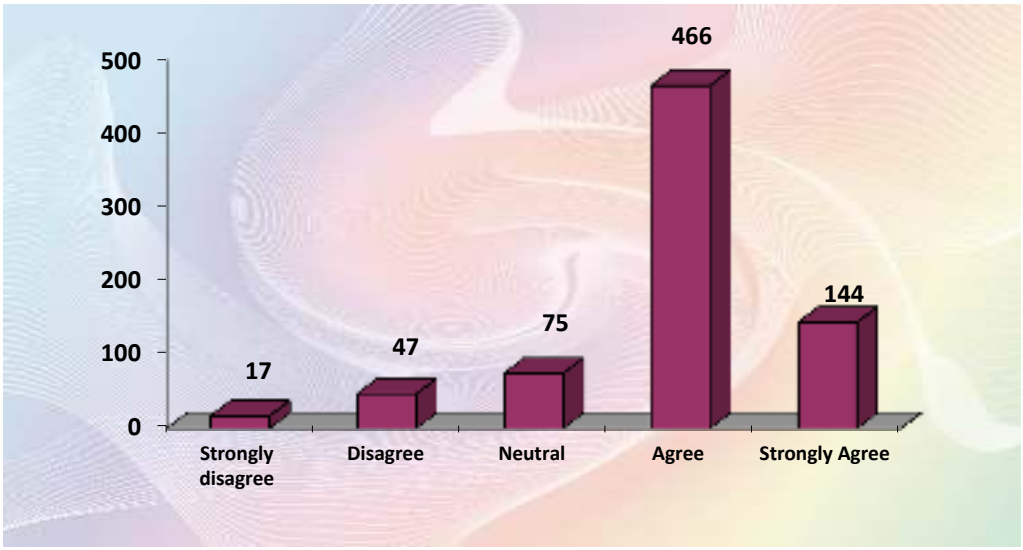
Rationale: One of the cattle feed ingredient is green fodder which has a bearing on the production of the milk. If the green fodder is available from own field it is advantageous. One can ensure good quality of green fodder. Therefore, it is always better to earmark part of the agricultural land for cultivation of green fodder. During the field study this important aspect has been studied which is presented in table 5.64.

Table 5.64: Response to the statement "I have earmarked a part of my agricultural land for cultivation of green fodder"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	17	47	75	466	144	750
Percentage	2.27	6.27	10.00	62.13	19.20	100

Source: Field survey data collected

Fig. 5.57: Response to the statement "I have earmarked a part of my agricultural land for cultivation of green fodder"



Interpretation

As high as 81.33% of the respondents have earmarked a part of their agricultural land for cultivation of green fodder. 10% respondents opted to be neutral. Only 8.54% respondents have either disagreed or strongly disagreed with the statement.

Statement 3: "I am aware of the advantages of ensuring cleanliness of the cattle shed"

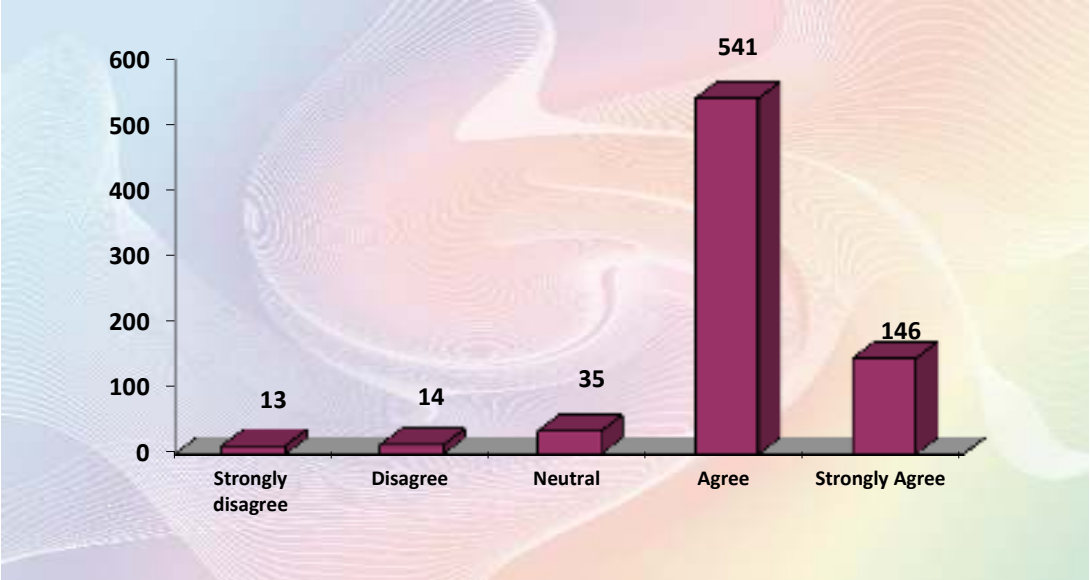
Rationale: Cleanliness of the cattle shed is of utmost importance. It ensures that there is no contamination. It ensures the proper healthcare of the livestock. It helps to ensure that the milk supply is uninterrupted, as the livestock maintains sound health. For this purpose there is requirement of adequate supply of water.

Table 5.65: Response to the statement "I am aware of the advantages of ensuring cleanliness of the cattle shed"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	13	14	35	541	146	750
Percentage	1.73	1.87	4.67	72.13	19.47	100

Source: Field survey data collected

Fig. 5.58: Response to the statement "I am aware of the advantages of ensuring cleanliness of the cattle shed"



Interpretation

The highest percentage of 91.6 8respondents is aware of the advantages of ensuring cleanliness of the shed. Hardly 4.67% respondents have opted to be neutral while 3.6% respondents have either disagreed or strongly disagreed.

Statement 4: "During the summer I ensure that the cattle shed climate is maintained cool by using various methods"

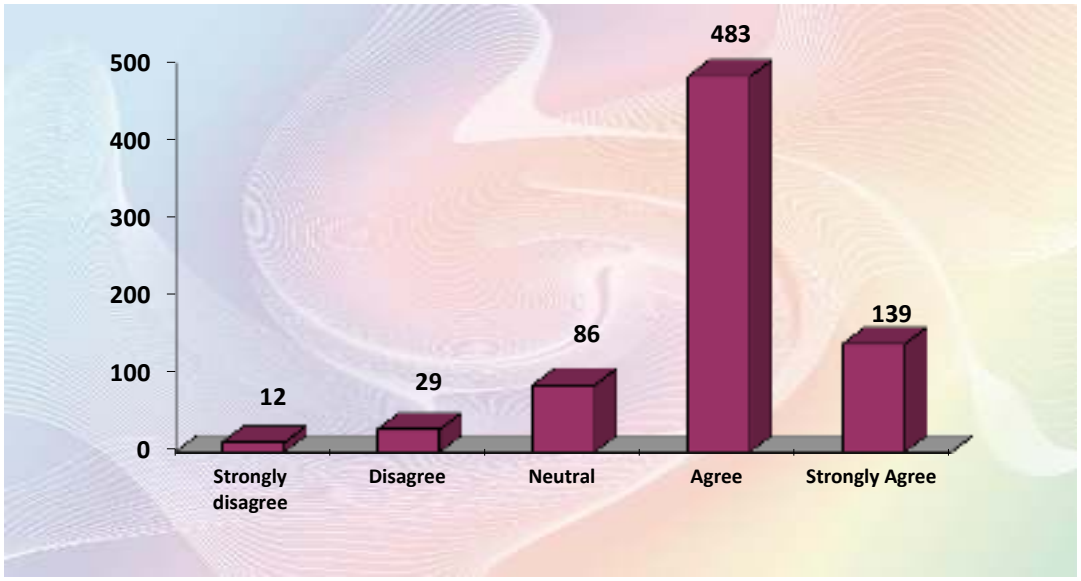
Rationale: Cattle are also living being. During the summer the cattle also require coolness in the cattle shed. This can be ensured by various means. Ensuring proper cross ventilation assures cool cattle shed which has a positive impact on the milk production. . If the cattle shed is having steel sheet cover then the atmosphere in the cattle shed gets hotter. Therefore, the dairy farmer should ensure that the steel sheets are covered by the dried plant stalks so that heat is absorbed. If the size of the cattle is shed is sufficiently large and if there is abundant water supply the dairy farmer can use sprinklers on the shed top so that the cattle shed temperature can be brought down. The purpose of this statement was to ascertain the awareness and the concern of the dairy farmer about the well-being of the livestock. This crucial aspect has also been studied carefully during the field research and is presented in table 5.66.

Table 5.66: Response to the statement "During the summer I ensure that the cattle shed climate is maintained cool by using various methods"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	12	29	86	483	139	750
Percentage	1.6	3.87	11.47	64.40	18.53	100

Source: Field survey data collected

Fig. 5.59: Response to the statement "During the summer I ensure that the cattle shed climate is maintained cool by using various methods"



Interpretation

The data in table 5.66 shows 82.93% of the respondents are well aware of the need for maintaining the cattle shed cool during summer by using various methods such use of sprinkler on the rooftop etc. 11.47% respondents preferred to be neutral. The rest of the respondents disagreed with the statement.

Statement 5: "I am aware that there are number of varieties of semen and I insist ~on particular semen irrespective of cost to ensure improvement in milk quantity"

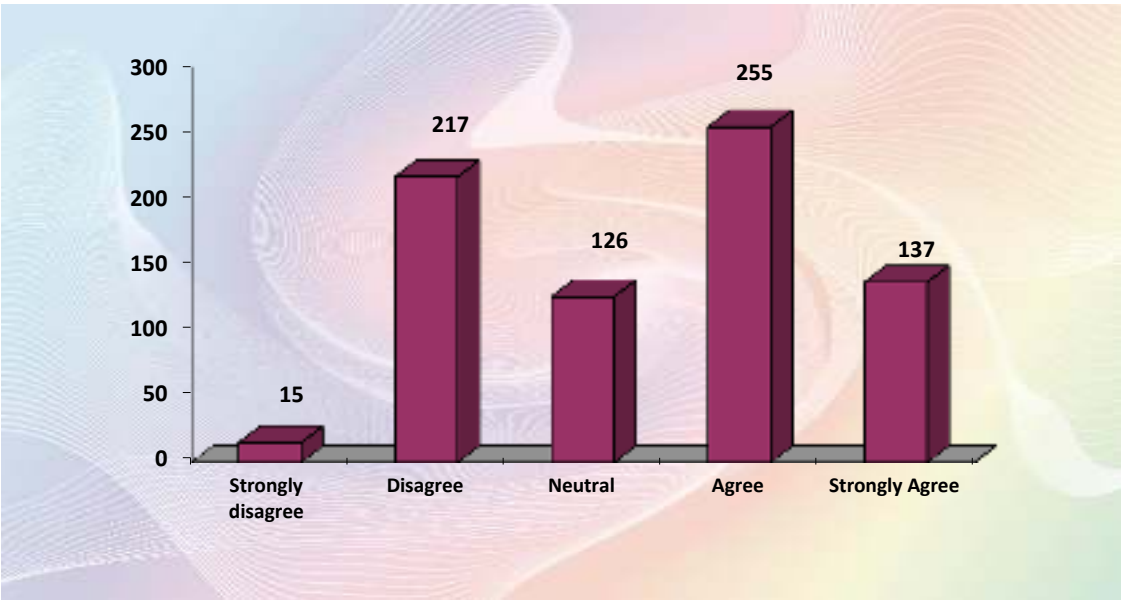
Rationale: During the field study sincere attempt has been made to enquire whether the dairy farmers are willing to use quality semen irrespective of cost of it. The statement tests knowledge of variety of semen and the dairy farmers' preparedness to use it irrespective cost.

Table 5.67: Response to the statement "I am aware that there are number of varieties of semen and I insist on particular semen irrespective of cost to ensure improvement in milk quantity"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	15	217	126	255	137	750
Percentage	2	28.93	16.80	34.00	18.27	100

Source: Field survey data collected

Fig. 5.60: Response to the statement "I am aware that there are number of varieties of semen and I insist on particular semen irrespective of cost to ensure improvement in milk quantity"



Interpretation

As indicated in table 5.67, 52.27% respondents are aware of the number varieties of semen and that they insist on particular semen irrespective of cost to ensure improvement in the milk quantity. 16.80% respondents preferred to be neutral while 30.93% disagreed with the statement.

Statement 6: "Dairy is an activity in our family for last few generations and therefore, I am aware of the precautions of the health/management of the livestock"

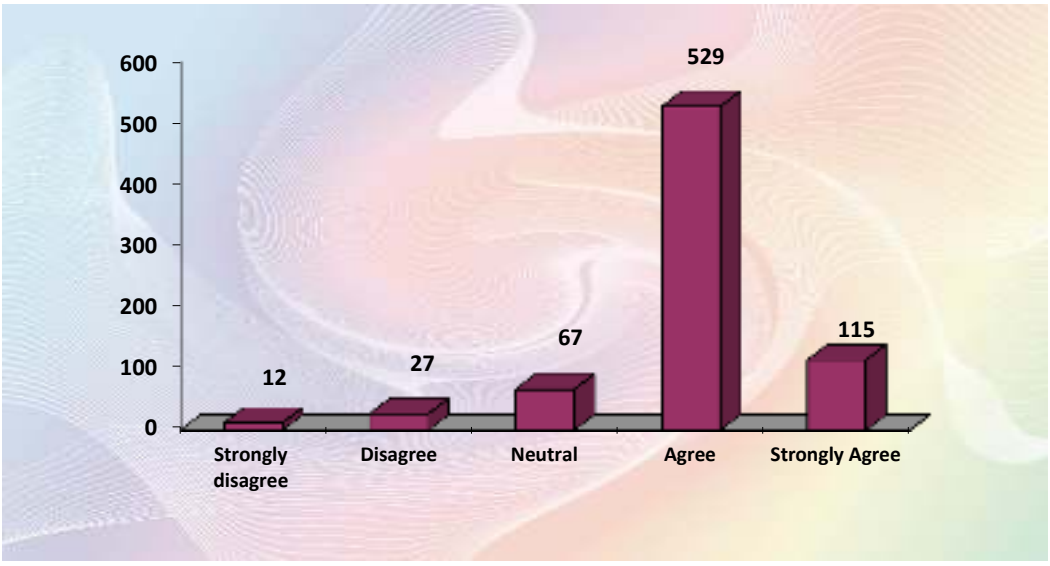
Rationale: In India agriculturists are pursing dairy activity for a very long time. Generations after generations pursue this dairy activity pursued. As a result the agriculturist families are well aware of the various precautions to be taken while managing a dairy unit. Even though this is a factual situation, there are some agriculturists who are new to this activity and they require training in dairy activity. Though it is a traditional activity in a family it should also take a note of the fact that lot of new medicines and practices have been evolved during the last few decades and if those are adopted it will further strengthen the management of the dairy unit.

Table 5.68: Response to the statement "Dairy is an activity in our family for last few generations and therefore, I am aware of the precautions of the health/management of the livestock"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	12	27	67	529	115	750
Percentage	1.6	3.60	8.93	70.53	15.33	100

Source: Field survey data collected

Fig. 5.61: Response to the statement "Dairy is an activity in our family for last few generations and therefore, I am aware of the precautions of the health and management of the livestock"



Interpretation

The data in the table 5.68 reveals that 85.86% of the respondents are traditional dairy farmers and therefore they are aware of the precautions of the health and management of the livestock. Only 8.93% of the respondents opted to be neutral, while negligible respondents disagreed with the statement.

Statement 7: "I am aware of the precautions to be taken while conducting A.I. Operation"

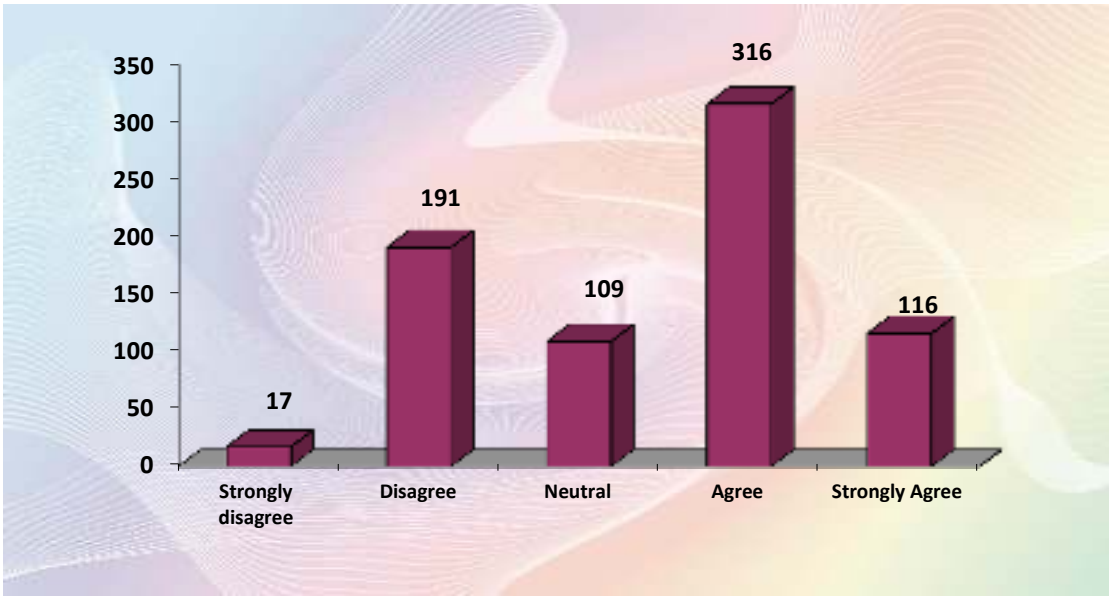
Rationale: This again a repeat statement to cross checks the earlier response. Lots of precautions are required to be taken while administering the artificial insemination operation. Cleanliness, selection of semen of high quality breed bullock, etc. If these precautions are taken by the dairy farmers benefit about the quality of the calf is assured..

Table 5.69: Response to the statement "I am aware of the precautions to be taken while conducting A.I. Operation"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	17	191	109	316	116	750
Percentage	2.27	25.47	14.53	42.13	15.47	100

Source: Field survey data collected

Fig. 5.62: Response to the statement "I am aware of the precautions to be taken while conducting A.I. Operation"



Interpretation

Table 5.69 indicates that 57.6% respondents are aware of the precautions to be taken while conducting Artificial Insemination Operation. On the other hand 42.7% of the respondents remained neutral/disagreed/strongly disagreed.

Statement 8: "I know the care to be taken of the pregnant cattle"

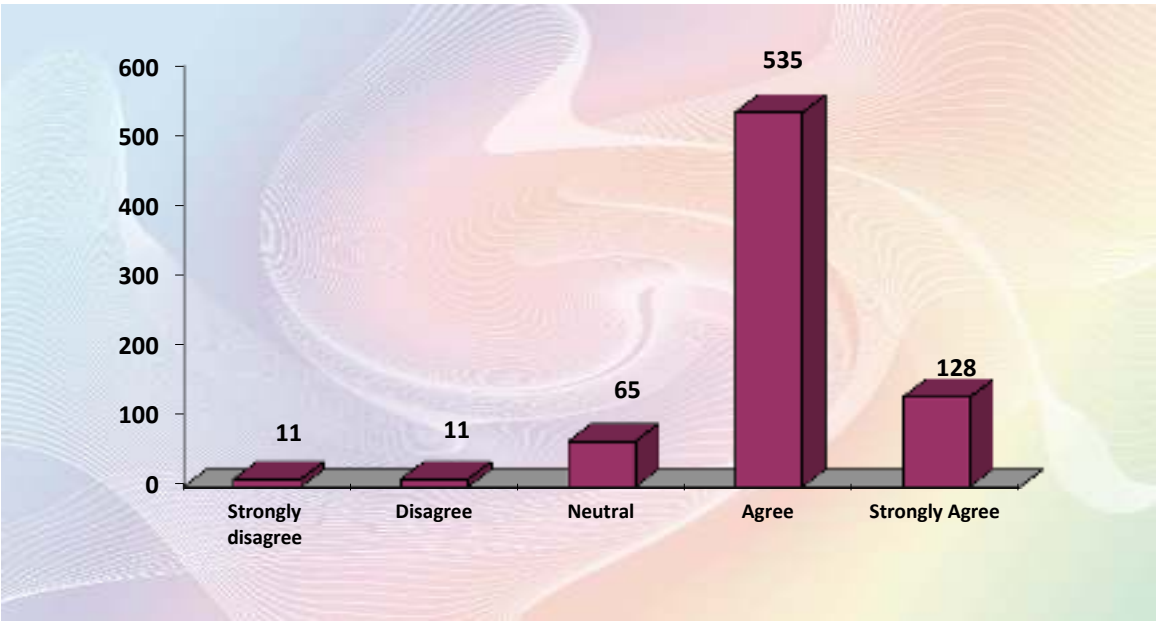
Rationale: Like in the human being pregnant livestock also require greater healthcare which requires frequent check up with the veterinary doctor, quality food intake, cleanliness, etc. The response to the statement indicates as to how much knowledge the dairy farmers have about the care to be taken of the pregnant cattle.

Table 5.70: Response to the statement "I know the care to be taken of the pregnant cattle"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	11	11	65	535	128	750
Percentage	1.47	1.47	8.67	71.33	17.07	100

Source: Field survey data collected

Fig. 5.63: Response to the statement "I know the care to be taken of the pregnant cattle"



Interpretation

The data in table 5.70 reveals that 88.4% of the respondents are aware of care to be taken when the cattle is pregnant. This is because majority of the dairy farmers are traditionally carrying out dairy activity. Only 8.67% of the respondents opted to be neutral, while 2.94% of the respondents disagreed with the statement.

Statement 9: "I strictly observe cleanliness in all the dairy activities such as while milking the cow, supplying the milk to the society etc."

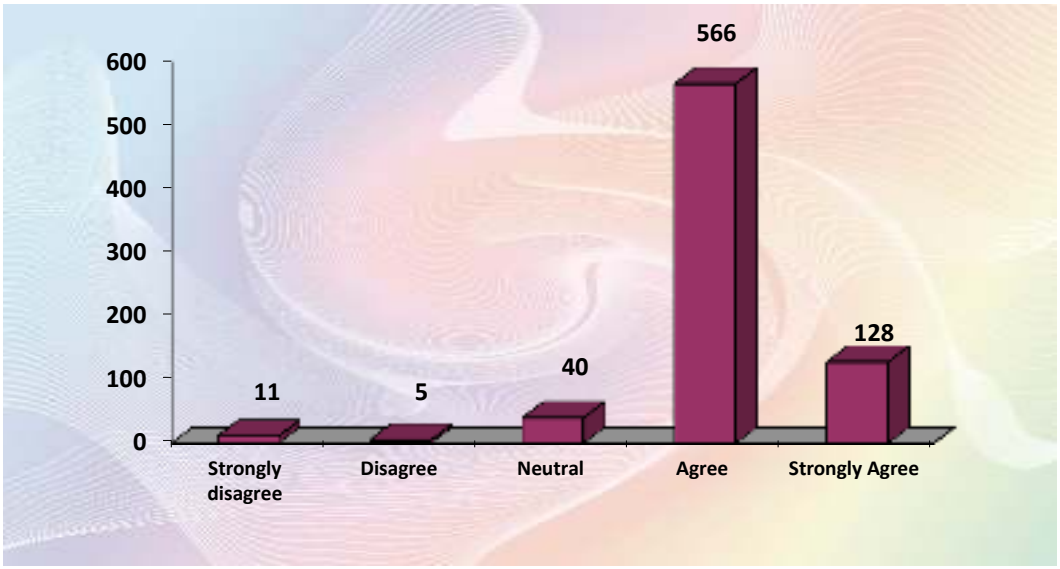
Rationale: The statement focuses on the cleanliness required to be maintained in the dairy activities. The cleanliness ensures the healthcare of the livestock, as well as improves the milking the cow, transporting the milk to the dairy society etc. If proper care is taken, there are less chances of milk getting spoiled. This feedback is useful to ascertain the level of cleanliness being observed the respondents in their dairy activity.

Table 5.71: Response to the statement "I strictly observe cleanliness in all the dairy activities such as while milking the cow, supplying the milk to the society etc."

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	11	5	40	566	128	750
Percentage	1.47	0.67	5.33	75.47	17.07	100

Source: Field survey data collected

Fig. 5.64: Response to the statement "I strictly observe cleanliness in all the dairy activities such as while milking the cow, supplying the milk to the society etc."



Interpretation

As high as 92.54% of the respondents have stated that they strictly observe cleanliness in all the diary activities such as while milking the cow, supplying milk to the society etc. Less than Only 8% respondents have either preferred to be neutral or disagreed.

Statement 10: "I am ensuring that all my cattle are given vaccination at periodical interval and I stand to benefit from it"

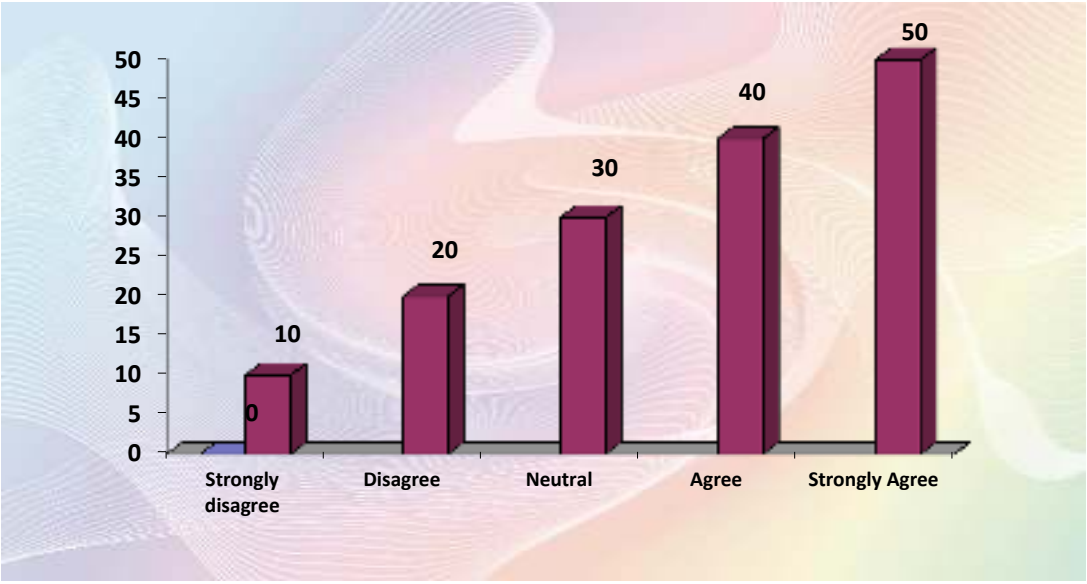
Rationale: This again a statement relating to the healthcare of the livestock. In order to ensure that the cattle do not succumb to any disease at periodical interval vaccination of the cattle is a must. If these vaccinations are properly given there is no possibility of falling fray to any disease. The response to this statement gives the level of awareness of the dairy farmer about the health of the livestock.

Table 5.72: Response to the statement "I am ensuring that all my cattle are given vaccination at periodical interval and I stand to benefit from it"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	15	44	58	459	173	750
Percentage	2	5.87	7.73	61.20	23.07	100

Source: Field survey data collected

Fig. 5.65: Response to the statement "I am ensuring that all my cattle are given vaccination at periodical interval and I stand to benefit from it"



Interpretation

As high as 84.27% respondents ensure that all their cattle are given vaccination at periodical interval and they stand to benefit out of it. 7.73% of the respondents opted to be neutral. 7.87% of the respondents disagreed with the statement.

5.3 PRESENTATION OF DATA RELATING TO DAIRY SOCIETIES

The village dairy societies have also an important role in the conduct of the dairy activity. The researcher has also collected certain data which has a bearing on the functioning of the dairy societies in relation to the maintenance of livestock. The data is presented with its analysis in the following paragraph :

1. Audit Classification of the respondent Dairy Societies

Table 5.73: Classification of the dairy societies on the basis of audit classification as n 31.3.2017

Audit class	A	B	C	D	Non audited	Total
No. of societies	13	43	0	0	3	59

Source: Field survey data collected

The above data indicates that out of total 59 societies under study 22.03 per cent societies are having "A" grade audit rating while 72.88 per cent are having audit rating as "B" grade. 3 societies were still to be audited.

2. Daily milk collection in liters per day.

Table 5.74: Daily Milk Collection of the identified dairy societies in l/p/d. Position as on 31.3.2017

Sr. No.	Type of cattle	Period	
		During peak period (L/P/D)	During lean period(LPD)
1	Cows	58678	31216
2	Buffaloes		

Source: Field survey data collected

3. Supply of cattle feed to the members of the society

Numbers of dairy societies have made arrangements to supply cattle feed and routine medicines to their members. The position in this regard is presented in table 5.75:

Table 5.75: Data relating to societies supplying cattle feed/routine medicines to the members Position as on 31.3.2017

Number of societies supplying cattle feed /routine medicine to the members	Number of societies not supplying cattle feed /routine medicine to the members	Total Societies
43	12	55

Source: Field survey data collected

The above table indicates that 72.88 per cent societies supply cattle feed and or routine medicines to the members whereas 27.12 per cent of the societies do not have this arrangement. Therefore members procure their requirement from the local market.

4. Payment of milk supplied to the dairy – its mode and frequency:

The dairy societies make payment of the sale proceeds of milk by different mode and at different frequency. Therefore, this data is presented hereunder:

Table 5.76: Data relating to mode and frequency of payment of milk sale proceeds

Particulars		**No. of Societies**	**Frequency**	**No. of societies**
Mode of payment	In Cash	**0**	Weekly	**0**
	By credit to supplier's Bank A/c.	**55**	Fortnightly	**55**
			Monthly	**0**
	Total	**55**	**Total**	**55**

Source: Field survey data collected

During the field study te dairy societies were also asked to offer their choices on certain statements which throw light on the various activities undertaken by the dairy societies. These responses are presented hereunder in the same format used for the dairy farmers.

Statement 1: "Our society organizes training programs for the milk supplier members"

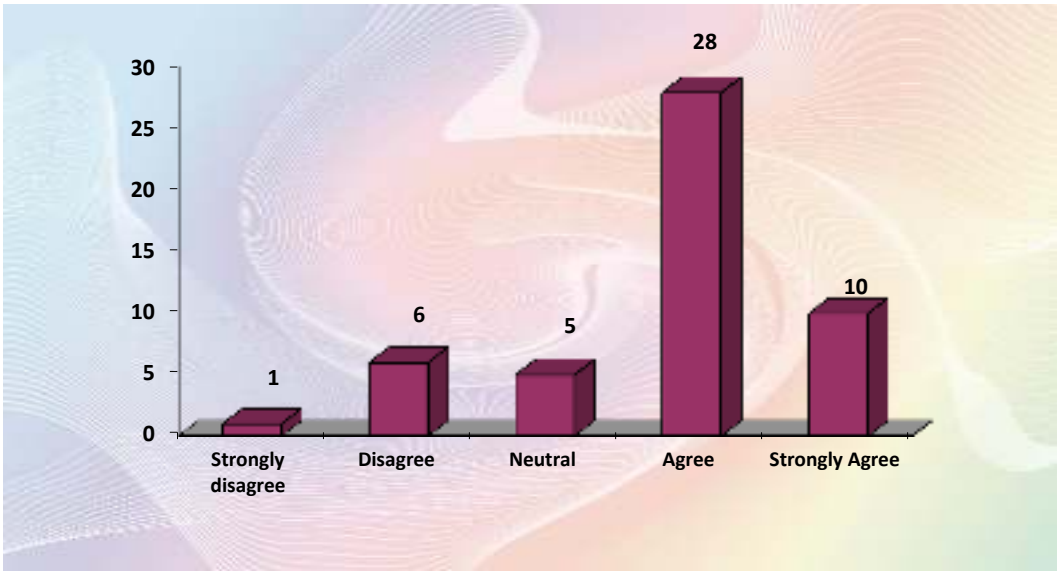
Rationale: In order to educate the member dairy farmers the dairy societies conduct training programs. The following data present the position on this score:

Table 5.77: Response to the statement "Our society organizes training programs for the milk supplier members"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	1	6	5	28	10	50
Percentage	2	12	10	56	20	100

Source: Field survey data collected

Fig. 5.66: Response to the statement "Our society organizes training programs for the milk supplier members"



Interpretation

The data presented in table 5.77 reveals that 76% of the respondents either agree or strongly agree with the statement that their society organizes training

programs for the milk supplier members. 10% of the respondents opted to be neutral and 14% respondents were either disagreed or strongly disagreed.

Statement 2: "We assist the financing banks for recovery of their loan installment from the sale proceeds of the milk"

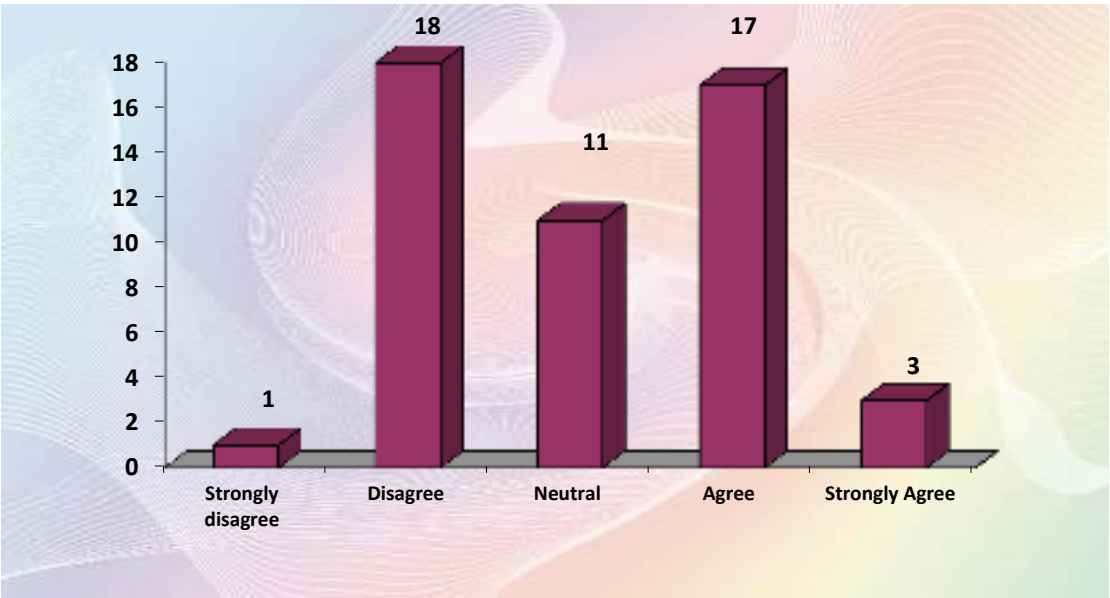
Rationale: Normally the dairy farmers borrow for their dairy activity from the banking sector. The banks feel comfortable where there is availability of forward recovery linkage. i.e. if the society which is receiving milk supply from the borrower member, the society should deduct the loan installment from the sale proceeds and credit it to the bank loan account of the member directly. If the assistance from the dairy society is available for recovery, banks are also encouraged to finance the dairy activity.

Table 5.78: Response to the statement "We assist the financing banks for recovery of their loan installment from the sale proceeds of the milk"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	1	18	11	17	3	50
Percentage	2	36	22	34	6	100

Source: Field survey data collected

Fig. 5.67: Response to the statement "We assist the financing banks for recovery of their loan installment from the sale proceeds of the milk"



Interpretation

The data presented in table 5.78 indicates that 40% of the respondents have stated that their society assets the financing banks for recovery of their loan installment from the sale proceeds of the milk. 22% respondents preferred to be neutral. 38% of the respondents have either disagreed/strongly disagreed.

Statement 3: "There is a fair competition amongst members of the society to increase the milk supply"

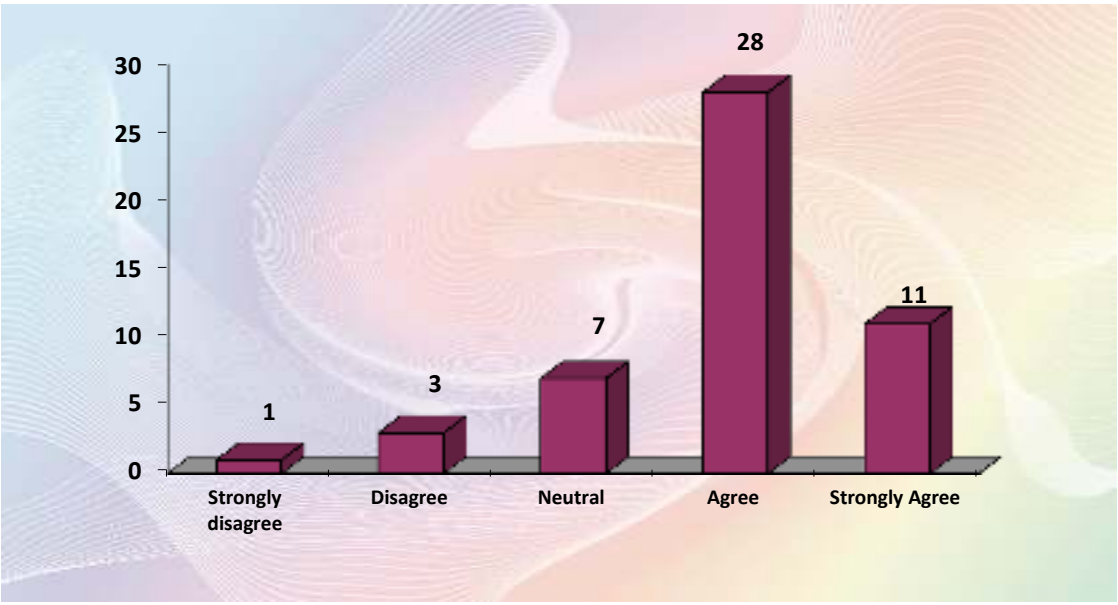
Rationale: Usually when there is a competition amongst the members the performance is improved. This competition spirit amongst the dairy farmers helps the societies to increase the milk supply. The feedback on the presence of competition amongst the members has been collected and presented hereunder:

Table 5.79: Response to the statement "There is a fair competition amongst members of the society to increase the milk supply"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	1	3	7	28	11	50
Percentage	2	6	14	56	22	100

Source: Field survey data collected

Fig. 5.68: Response to the statement "There is a fair competition amongst members of the society to increase the milk supply"



Interpretation

The data in table 5.79 reveals that 78% of the respondents either agreed or strongly agree with the statement that there is a fair competition amongst members of the society to increase the milk supply. It is a healthy sign. 14% of the respondents have preferred to be neutral while 8% of them have either disagreed or strongly disagreed.

Statement 4: "We have competition amongst the various societies operating in the Taluka"

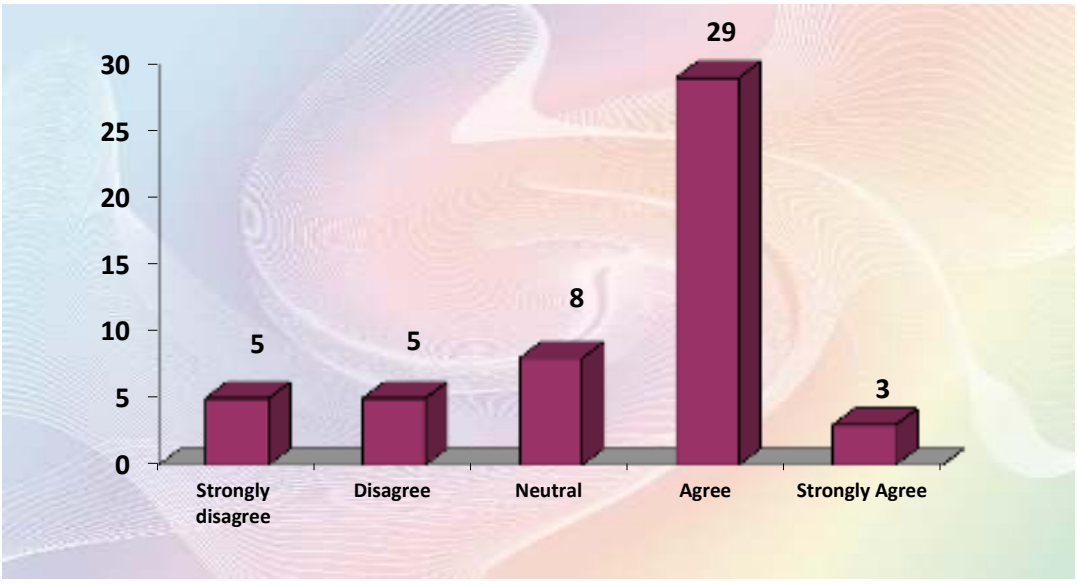
Rationale: Same is the rationale that has been given in the earlier statement. Healthy competition amongst the societies functioning in the same Taluka, to augment milk collection is helpful for the growth of the milk collection. The District Union conducts such competition which is a good practice.

Table 5.80: Response to the statement "We have competition amongst the various societies operating in the Taluka"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	5	5	8	29	3	50
Percentage	10	10	16	58	6	100

Source: Field survey data collected

Fig. 5.69: Response to the statement "We have competition amongst the various societies operating in the Taluka"



Interpretation

The data in table 5.80 indicates that 64% of the respondents agreed or strongly agreed that they have competition amongst the various societies operating in the Taluka. 16% remained neutral while 20% respondents have either disagreed or strongly disagreed with the statement.

Statement 5: "According to our information the insurance claims of the members are promptly paid"

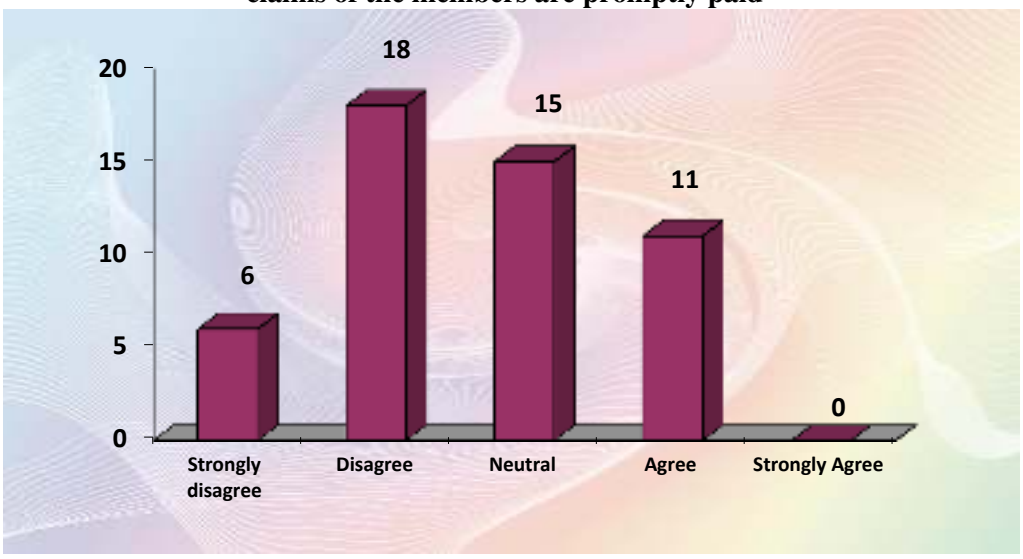
Rationale: Usually the livestock is insured by the dairy farmers. Whenever the dairy farmer has raised any loan against the livestock the financing bank makes it obligatory to insure the livestock so that in case of any unpleasant event the dairy farmer can put up the insurance claim with the insurance company. Through this feedback the researcher has enlisted the perception of the dairy societies about the time taken for settlement of the claim.

Table 5.81: Response to the statement "According to our information the insurance claims of the members are promptly paid"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	6	18	15	11	0	50
Percentage	12	36	30	22	0	100

Source: Field survey data collected

Fig. 5.70: Response to the statement "According to our information the insurance claims of the members are promptly paid"



Interpretation

The data in table 5.81 revealed that hardly 22% societies received the insurance claims promptly. 60% preferred to be neutral, or they may not be aware of it. 48% of the respondents have either disagreed or strongly disagreed with the statement. It means there is need to have a dialogue between the insurance companies and the dairy societies and that claim settlement process be expedited.

Statement 6: "Banks in the area are promptly entertaining the dairy loan proposals from the members"

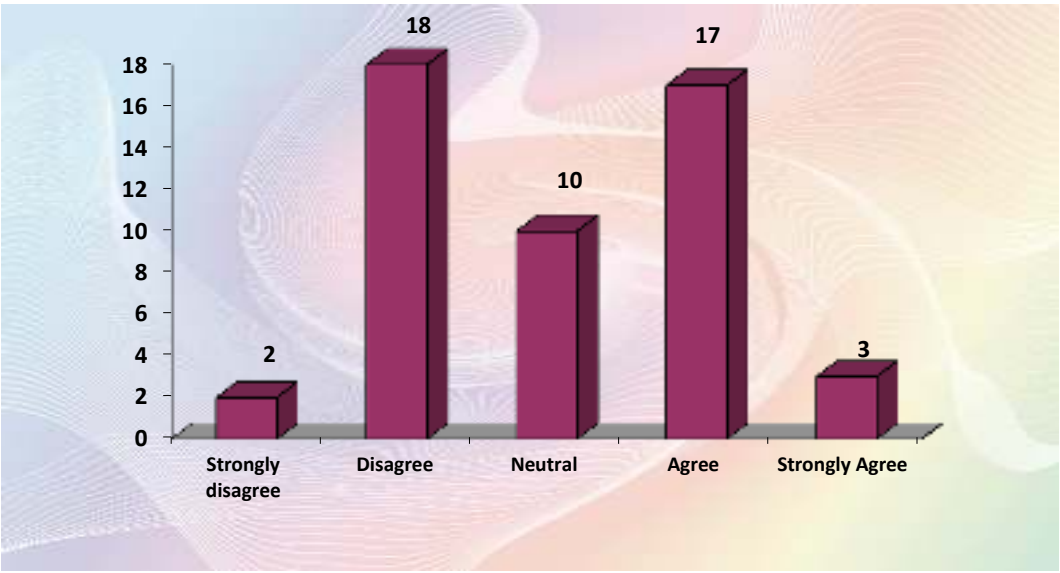
Rationale: This feedback from the dairy societies was sought to know how far the banks are helping the dairy farmers to expand their dairy activity.

Table 5.82: Response to the statement "Banks in the area are promptly entertaining the dairy loan proposals from the members"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	6	18	15	11	0	50
Percentage	12	36	30	22	0	100

Source: Field survey data collected

Fig. 5.71: Response to the statement "Banks in the area are promptly entertaining the dairy loan proposals from the members"



Interpretation

This statement was included in the questionnaire of both the categories of the respondents to cross check each other's responses. It has been observed that 22% of the authorities of the societies have agreed with the statement and the percentage of the disagreed or strongly disagreed is at 48% which is quite high. It means banks are not sanctioning the dairy loans promptly.

Statement 7: "We provide our members' information about the Govt. Schemes relating to dairy activity so that they can take the benefit of those schemes."

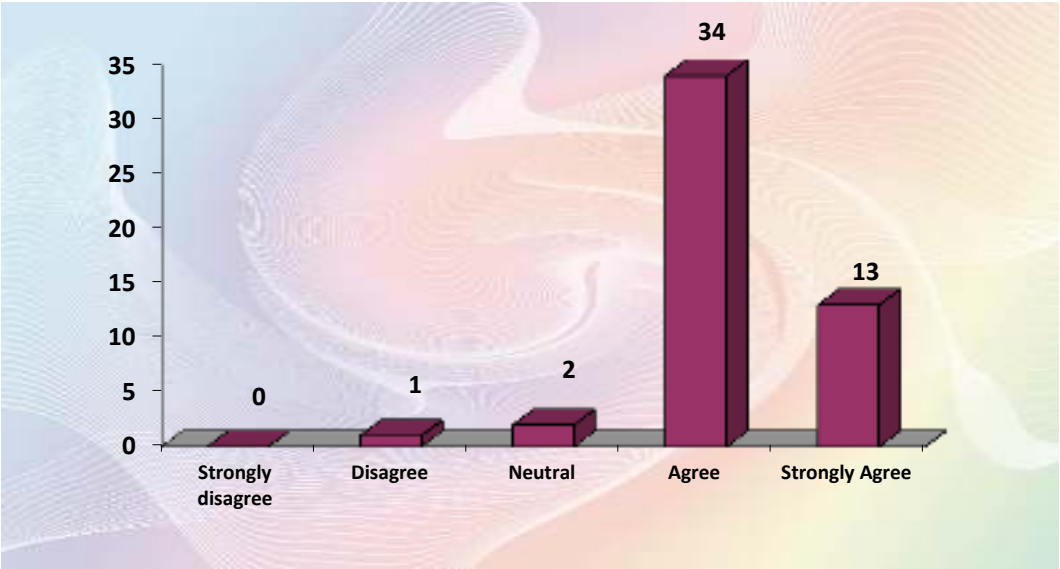
Rationale: The data on this aspect has also been collected from the members. Through this feedback the researcher has cross checked the feedback from the members.

Table 5.83: Response to the statement "We provide our members information about the Govt. Schemes relating to dairy activity so that they can take the benefit of those schemes"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	0	1	2	34	13	50
Percentage	0	2	4	68	26	100

Source: Field survey data collected

Fig. 5.72: Response to the statement "We provide our members information about the Govt. Schemes relating to dairy activity so that they can take the benefit of those schemes"



Interpretation

The data presented in table 5.83 indicate that the dairy societies provide their members information about the Govt. Schemes relating to the dairy activity so that they can take the benefit of those schemes. This has been confirmed by 94% highest percentage respondents and only 4% have opted to be neutral and negligible 2% have disagreed with the said position. A similar statement was included in the questionnaire for the dairy farmers wherein their response was that the dairy society should arrange to inform the members about Government schemes in operation relating to the dairy activity which means it is not presently being given.

Statement 8: "Our suggestions for any improvement in the functioning of the society are taken well care of by the banks as well as our district dairy union"

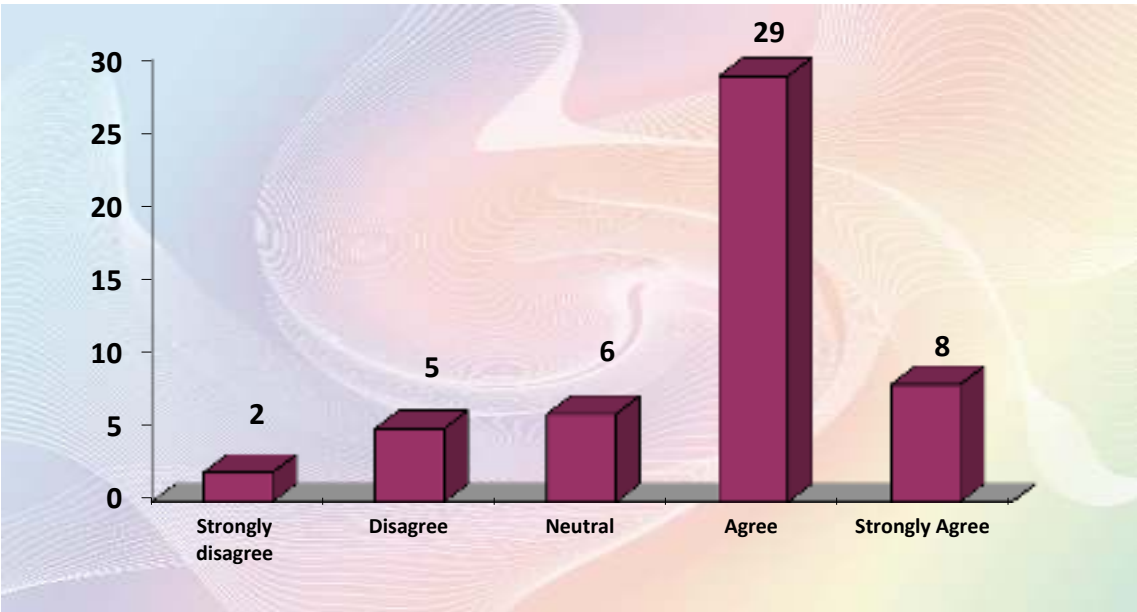
Rationale: The dairy societies are supplying the milk collected to the District Milk Union and payment received from them is distributed amongst the members of the society. This feedback has been collected to understand how the District Milk Union reacts to the suggestions of the dairy societies.

Table 5.84: Response to the statement, "Our suggestions for any improvement in the functioning of the society are taken well care of by the banks as well as our district dairy union"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	2	5	6	29	8	50
Percentage	4	10	12	58	16	100

Source: Field survey data collected

Fig. 5.73: Response to the statement, "Our suggestions for any improvement in the functioning of the society are taken well care of by the banks as well as our district dairy union"



Interpretation

The data in table 5.84 shows that 74% of the selected dairy societies have stated that their suggestions for any improvement in the functioning of the society are taken well care of by the banks as well as the district dairy union. Only 12% respondents remained neutral and the 14% of the respondent societies have either disagreed or strongly disagreed with the statement. If this is the situation, the dairy societies may take up the issue of delay in sanctioning the dairy loans by the banks and sort it out for mutual benefits.

Statement 9: "Our society is willing to make provision for cattle feed and usually required medicines as a supplementary activity so that it will be a help to the members as well as the society can make reasonable profit through bulk buying."

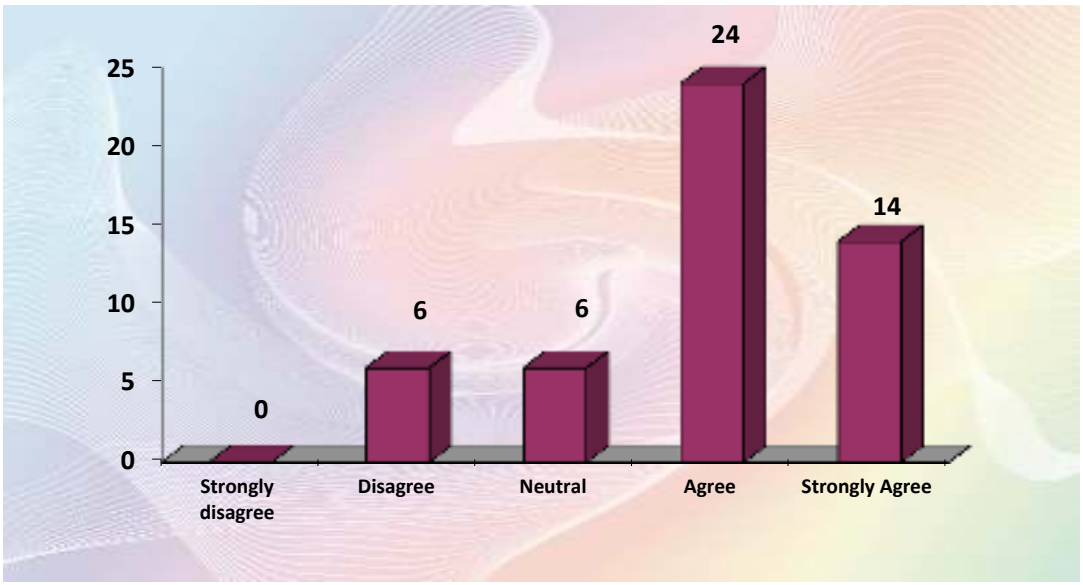
Rationale: For those dairy societies which are not currently providing cattle feed and routine medicines required by the dairy farmer, this data is useful. This provision -helps both the members as well as to the society for generation of surplus.

Table 5.85: Response to the statement, "Our society is willing to make provision for cattle feed and usually required medicines as a supplementary activity so that it will be a help to the members as well as the society can make reasonable profit through bulk buying."

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	0	6	6	24	14	50
Percentage	0	12	12	48	28	100

Source: Field survey data collected

Fig. 5.74 : Response to the statement, "Our society is willing to make provision for cattle feed and usually required medicines as a supplementary activity so that it will be a help to the members as well as the society can make reasonable profit through bulk buying."



Interpretation

The data presented in the table 5.85 reveals that 76% of the respondent societies have willingness to make provision for cattle feed and usually required medicines as a supplementary activity so that it will be a help to the members and the society can also make a profit through bulk buying. 12% of the respondent societies preferred to be neutral and the same percentage was of those societies disagreed with the statement.

Statement 10: "We get required support from the district dairy union for improving working of the society and improving the milk supply"

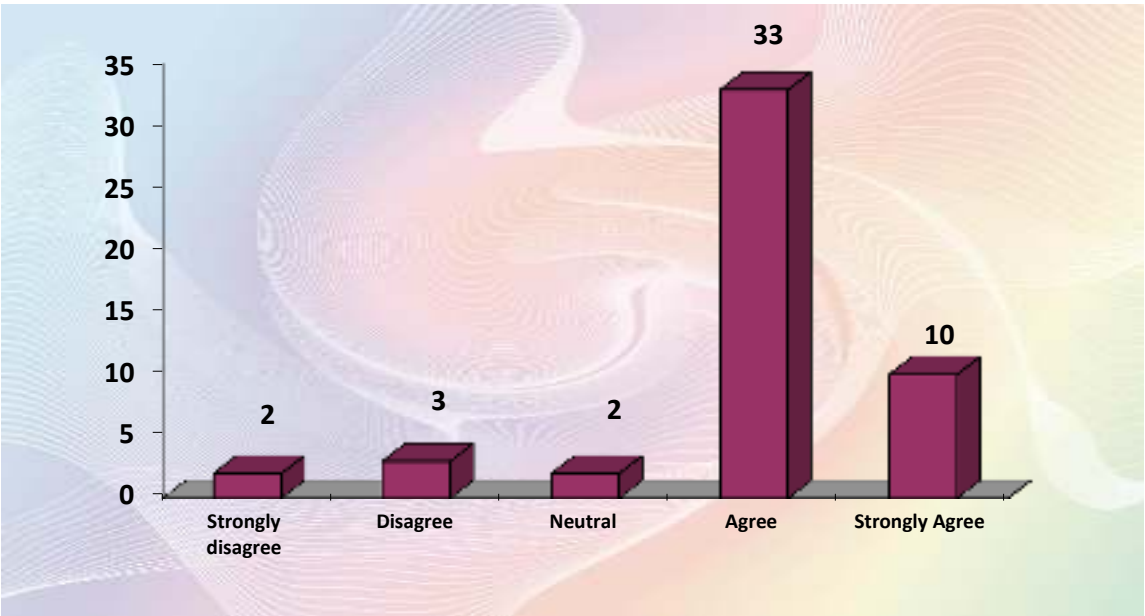
Rationale: Feedback on this score has been obtained to understand the mutual cooperation between the dairy society as well as the district milk union.

Table 5.86: Response to the statement, "We get required support from the district dairy union for improving working of the society and improving the milk supply"

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Respondents	2	3	2	33	10	50
Percentage	4	6	4	66	20	100

Source: Field survey data collected

Fig. 5.75: Response to the statement, "We get required support from the district dairy union for improving working of the society and improving the milk supply"



Interpretation

The data depicted in table 5.86 reveals that 86% of the responding dairy societies have affirmed that they get requisite support from the district dairy union for improving working of the societies and improving the milk supply. The figure of neutral and the disagreed societies is negligible.

5.4 HYPOTHESES TESTING

Hypotheses No: 1

Null Hypothesis:-

H_0: The dairy activity as allied activity to agriculture does not contribute significantly to the rural economy.

Vs

Alternate hypothesis

H_1: The dairy activity as allied activity to agriculture is contributing significantly to the rural economy.

Analysis:

Que. No	Strongly disagree	Disagree	Neutral	Strongly Agree	Agree	Totals
1	15	86	82	467	100	750
2	10	71	46	521	102	750
3	11	13	3	516	207	750
4	61	310	170	120	89	750
5	14	51	84	440	161	750
6	36	36	33	482	163	750
7	97	305	70	224	54	750
8	27	102	52	473	96	750
9	13	37	96	502	102	750
10	26	138	95	386	105	750
11	45	86	85	412	122	750
12	30	72	43	523	82	750
13	47	215	55	292	141	750
14	66	100	130	373	81	750
15	60	166	70	355	99	750
16	20	77	20	463	170	750
17	21	114	40	467	108	750
18	79	121	51	396	103	750
19	50	61	92	461	86	750
20	26	146	98	416	64	750

21	33	130	136	316	135	750
22	74	227	81	256	112	750
23	110	325	97	173	45	750
24	107	278	178	135	52	750
25	18	40	60	481	151	750
26	11	20	61	479	179	750
Totals	1107	3327	2028	10129	2909	19500

Sr. no	Observed frequency (Oij)	Expected frequency (eij)	(Oij)^2/eij
1	15	42.57692308	5.28455285
2	10	42.57692308	2.34869015
3	11	42.57692308	2.84191509
4	61	42.57692308	87.3947606
5	14	42.57692308	4.6034327
6	36	42.57692308	30.4390244
7	97	42.57692308	220.988257
8	27	42.57692308	17.1219512
9	13	42.57692308	3.96928636
10	26	42.57692308	15.8771454
11	45	42.57692308	47.5609756
12	30	42.57692308	21.1382114
13	47	42.57692308	51.8825655
14	66	42.57692308	102.308943
15	60	42.57692308	84.5528455
16	20	42.57692308	9.39476061
17	21	42.57692308	10.3577236
18	79	42.57692308	146.581752
19	50	42.57692308	58.7172538
20	26	42.57692308	15.8771454
21	33	42.57692308	25.5772358

22	74	42.57692308	128.614273
23	110	42.57692308	284.191509
24	107	42.57692308	268.901536
25	18	42.57692308	7.6097561
26	11	42.57692308	2.84191509
27	86	127.9615385	57.7986174
28	71	127.9615385	39.3946498
29	13	127.9615385	1.32070935
30	310	127.9615385	751.006913
31	51	127.9615385	20.3264202
32	36	127.9615385	10.1280433
33	305	127.9615385	726.976255
34	102	127.9615385	81.3056808
35	37	127.9615385	10.6985272
36	138	127.9615385	148.825969
37	86	127.9615385	57.7986174
38	72	127.9615385	40.5121731
39	215	127.9615385	361.241359
40	100	127.9615385	78.1484821
41	166	127.9615385	215.345957
42	77	127.9615385	46.334235
43	114	127.9615385	101.561767
44	121	127.9615385	114.417193
45	61	127.9615385	29.0790502
46	146	127.9615385	166.581304
47	130	127.9615385	132.070935
48	227	127.9615385	402.691313
49	325	127.9615385	825.443342
50	278	127.9615385	603.962729
51	40	127.9615385	12.5037571
52	20	127.9615385	3.12593928
53	82	78	86.2051282

54	46	78	27.1282051
55	3	78	0.11538462
56	170	78	370.512821
57	84	78	90.4615385
58	33	78	13.9615385
59	70	78	62.8205128
60	52	78	34.6666667
61	96	78	118.153846
62	95	78	115.705128
63	85	78	92.6282051
64	43	78	23.7051282
65	55	78	38.7820513
66	130	78	216.666667
67	70	78	62.8205128
68	20	78	5.12820513
69	40	78	20.5128205
70	51	78	33.3461538
71	92	78	108.512821
72	98	78	123.128205
73	136	78	237.128205
74	81	78	84.1153846
75	97	78	120.628205
76	178	78	406.205128
77	60	78	46.1538462
78	61	78	47.7051282
79	467	389.5769231	559.809853
80	521	389.5769231	696.758416
81	516	389.5769231	683.449107
82	120	389.5769231	36.963175
83	440	389.5769231	496.949353
84	482	389.5769231	596.349492
85	224	389.5769231	128.79613

86	473	389.5769231	574.287096
87	502	389.5769231	646.865831
88	386	389.5769231	382.455919
89	412	389.5769231	435.713693
90	523	389.5769231	702.118077
91	292	389.5769231	218.863066
92	373	389.5769231	357.128443
93	355	389.5769231	323.491954
94	463	389.5769231	550.261033
95	467	389.5769231	559.809853
96	396	389.5769231	402.528976
97	461	389.5769231	545.517425
98	416	389.5769231	444.215224
99	316	389.5769231	256.319084
100	256	389.5769231	168.223517
101	173	389.5769231	76.8243657
102	135	389.5769231	46.7815184
103	481	389.5769231	593.877579
104	479	389.5769231	588.949156
105	100	111.8846154	89.3777931
106	102	111.8846154	92.9886559
107	207	111.8846154	382.974905
108	89	111.8846154	70.7961499
109	161	111.8846154	231.676177
110	163	111.8846154	237.467858
111	54	111.8846154	26.0625645
112	96	111.8846154	82.3705741
113	102	111.8846154	92.9886559
114	105	111.8846154	98.5390168
115	122	111.8846154	133.029907
116	82	111.8846154	60.0976281
117	141	111.8846154	177.69199

118	81	111.8846154	58.64077
119	99	111.8846154	87.599175
120	170	111.8846154	258.301822
121	108	111.8846154	104.250258
122	103	111.8846154	94.8209007
123	86	111.8846154	66.1038157
124	64	111.8846154	36.609144
125	135	111.8846154	162.891028
126	112	111.8846154	112.115504
127	45	111.8846154	18.0990031
128	52	111.8846154	24.1677552
129	151	111.8846154	203.790306
130	179	111.8846154	286.375387
Total	19500	19500	23645.6089

- Value of test Statistic:-

  Chi-square calculated:- 4145.6089

  Chi-square table value:- 124.3421

  Comparison:-

  Here, Chi-square calculated > Chi-square table value

  $\Rightarrow$ Reject H_0 at 5% Level of significance.

- **Conclusion:-**

  The dairy activity as allied activity to agriculture is contributing significantly to the rural economy.

Hypotheses No: 2

Null Hypothesis:-

H_0: There is a no scope to enlarge the dairy activity.

Vs

Alternate hypothesis

H_1: There is a wide scope for enlarging the dairy activity.

Analysis:

Que. No	Strongly disagree	Disagree	Neutral	Strongly Agree	Agree	Totals
1	25	96	76	462	91	750
2	13	12	17	546	162	750
3	14	9	21	535	171	750
4	16	70	93	433	138	750
5	15	12	23	543	157	750
6	13	3	12	550	172	750
7	16	27	37	562	108	750
8	19	103	47	510	71	750
9	119	340	94	146	51	750
10	33	177	107	362	71	750
Totals	283	849	527	4649	1192	7500

Sr. no	Observed frequency (Oij)	Expected frequency (eij)	(Oij)^2/eij
1	25	28.3	22.08480565
2	13	28.3	5.971731449
3	14	28.3	6.925795053
4	16	28.3	9.045936396
5	15	28.3	7.950530035
6	13	28.3	5.971731449
7	16	28.3	9.045936396
8	19	28.3	12.75618375
9	119	28.3	500.3886926

10	33	28.3	38.48056537
11	96	84.9	108.5512367
12	12	84.9	1.696113074
13	9	84.9	0.954063604
14	70	84.9	57.71495878
15	12	84.9	1.696113074
16	3	84.9	0.106007067
17	27	84.9	8.586572438
18	103	84.9	124.958775
19	340	84.9	1361.601885
20	177	84.9	369.0106007
21	76	52.7	109.601518
22	17	52.7	5.483870968
23	21	52.7	8.368121442
24	93	52.7	164.1176471
25	23	52.7	10.03795066
26	12	52.7	2.732447818
27	37	52.7	25.9772296
28	47	52.7	41.91650854
29	94	52.7	167.6660342
30	107	52.7	217.2485769
31	462	464.9	459.1180899
32	546	464.9	641.2475801
33	535	464.9	615.6700366
34	433	464.9	403.2888793
35	543	464.9	634.2202624
36	550	464.9	650.6775651
37	562	464.9	679.3805119
38	510	464.9	559.4751559
39	146	464.9	45.85072059
40	362	464.9	281.8756722
41	91	119.2	69.47147651

42	162	119.2	220.1677852
43	171	119.2	245.3104027
44	138	119.2	159.7651007
45	157	119.2	206.7869128
46	172	119.2	248.1879195
47	108	119.2	97.85234899
48	71	119.2	42.29026846
49	51	119.2	21.8204698
50	71	119.2	42.29026846
Total	7500	7500	9731.395565

- Value of test Statistic:-

  Chi-square calculated: 2231.3955

  Chi-square table value: 50.9984602

- Comparison:-

  Here, Chi-square calculated > Chi-square table value

  $\Rightarrow$ Reject H_0 at 5% Level of significance.

- **Conclusion:- Therefore, the hypothesis i.e. "There is a wide scope for enlarging the dairy activity stands positively tested.**

Hypotheses No: 3

Null Hypothesis:-

H_0: The cooperative dairy organization does not play any role to financially strengthen the rural farmers.

Vs

Alternate hypothesis

H_1: The cooperative dairy organizations are playing a key role to financially strengthen the rural farmers.

Analysis:

Que. No	Strongly disagree	Disagree	Neutral	Strongly Agree	Agree	Totals
1	20	75	65	496	94	750
2	22	24	66	553	85	750
3	68	104	48	443	87	750
4	29	89	90	444	98	750
5	16	45	83	529	77	750
6	19	37	96	507	91	750
7	15	23	26	545	141	750
8	17	79	58	398	198	750
9	13	29	21	502	185	750
10	16	10	20	546	158	750
11	32	221	132	234	131	750
12	15	73	84	474	104	750
13	12	25	39	558	116	750
14	14	6	28	524	178	750
Total	308	840	856	6753	1743	10500

Sr. no	Observed frequency (Oij)	Expected frequency (eij)	(Oij)^2/eij
1	20	22	18.1818182
2	22	22	22
3	68	22	210.181818
4	29	22	38.2272727
5	16	22	11.6363636
6	19	22	16.4090909
7	15	22	10.2272727
8	17	22	13.1363636
9	13	22	7.68181818
10	16	22	11.6363636
11	32	22	46.5454545

12	15	22	10.2272727
13	12	22	6.54545455
14	14	22	8.90909091
15	75	60	93.75
16	24	60	9.6
17	104	60	180.266667
18	89	60	132.016667
19	45	60	33.75
20	37	60	22.8166667
21	23	60	8.81666667
22	79	60	104.016667
23	29	60	14.0166667
24	10	60	1.66666667
25	221	60	814.016667
26	73	60	88.8166667
27	25	60	10.4166667
28	6	60	0.6
29	65	61.14285714	69.1004673
30	66	61.14285714	71.2429907
31	48	61.14285714	37.682243
32	90	61.14285714	132.476636
33	83	61.14285714	112.670561
34	96	61.14285714	150.728972
35	26	61.14285714	11.0560748
36	58	61.14285714	55.0186916
37	21	61.14285714	7.21261682
38	20	61.14285714	6.54205607
39	132	61.14285714	284.971963
40	84	61.14285714	115.401869
41	39	61.14285714	24.8761682
42	28	61.14285714	12.8224299
43	496	482.3571429	510.028728

44	553	482.3571429	633.988746
45	443	482.3571429	406.854139
46	444	482.3571429	408.693025
47	529	482.3571429	580.153117
48	507	482.3571429	532.901821
49	545	482.3571429	615.778173
50	398	482.3571429	328.395676
51	502	482.3571429	522.442766
52	546	482.3571429	618.039982
53	234	482.3571429	113.517548
54	474	482.3571429	465.78765
55	558	482.3571429	645.505109
56	524	482.3571429	569.237968
57	94	124.5	70.9718876
58	85	124.5	58.0321285
59	87	124.5	60.7951807
60	98	124.5	77.1405622
61	77	124.5	47.62249
62	91	124.5	66.5140562
63	141	124.5	159.686747
64	198	124.5	314.891566
65	185	124.5	274.899598
66	158	124.5	200.514056
67	131	124.5	137.839357
68	104	124.5	86.875502
69	116	124.5	108.080321
70	178	124.5	254.48996
Totals	10500	10500	11907.5937

- Value of test Statistic:-

  Chi-square calculated:- 1407.5937

  Chi-square table value:- 69.83216

- Comparison:-

  Here, Chi-square calculated > Chi-square table value

  $\Rightarrow$ Reject H_0 at 5% Level of significance.

- **Conclusion:-**

  The cooperative dairy organizations are playing a key role in financially strengthening the rural farmers.

Statistical Analysis of Objective 2

To study the level of awareness of risks in managing the livestock and the remedial measures being adopted by the dairy farmers / Dairy Cooperative societies, the comparative hypothesis for this data has been made.

Null Hypothesis:-

H_0: The level of awareness of risks in managing the livestock and the remedial measures being adopted by the dairy farmers / Dairy Cooperative societies are not appropriate.

Vs

Alternate hypothesis

H_1: The level of awareness of risks in managing the livestock and the remedial measures being adopted by the dairy farmers / Dairy Cooperative societies are appropriate.

Analysis :-

Que. No	Strongly disagree	Disagree	Neutral	Strongly Agree	Agree	Total
1	34	83	109	451	73	750
2	17	47	76	466	144	750
3	13	14	36	541	146	750
4	12	29	87	483	139	750
5	15	217	126	255	137	750
6	12	27	67	529	115	750
7	17	192	109	316	116	750
8	11	11	65	535	128	750
9	11	5	40	566	128	750
10	15	45	58	459	173	750
Total	157	670	773	4601	1299	7500

Sr. no	Observed frequency (Oij)	Expected frequency (eij)	(Oij)^2/eij
1	34	15.7	73.63057325
2	17	15.7	18.40764331
3	13	15.7	10.76433121
4	12	15.7	9.171974522
5	15	15.7	14.33121019
6	12	15.7	9.171974522
7	17	15.7	18.40764331
8	11	15.7	7.707006369
9	11	15.7	7.707006369
10	15	15.7	14.33121019
11	83	67	102.8208955
12	47	67	32.97014925
13	14	67	2.925373134
14	29	67	12.55223881
15	217	67	702.8208955
16	27	67	10.88059701
17	192	67	550.2089552
18	11	67	1.805970149
19	5	67	0.373134328
20	45	67	30.2238806
21	109	77.3	153.6998706
22	76	77.3	74.72186287
23	36	77.3	16.76584735
24	87	77.3	97.91720569
25	126	77.3	205.38163
26	67	77.3	58.07244502
27	109	77.3	153.6998706
28	65	77.3	54.65717982
29	40	77.3	20.69857697

30	58	77.3	43.51875809
31	451	460.1	442.0799826
32	466	460.1	471.9756575
33	541	460.1	636.1247555
34	483	460.1	507.039774
35	255	460.1	141.3279722
36	529	460.1	608.2177787
37	316	460.1	217.0310802
38	535	460.1	622.0930233
39	566	460.1	696.2747229
40	459	460.1	457.9026299
41	73	129.9	41.02386451
42	144	129.9	159.630485
43	146	129.9	164.095458
44	139	129.9	148.7374904
45	137	129.9	144.4880677
46	115	129.9	101.8090839
47	116	129.9	103.5873749
48	128	129.9	126.1277906
49	128	129.9	126.1277906
50	173	129.9	230.4003079
Total	7500	7500	8656.441

- Value of test Statistic:-

  Chi-square calculated:- 1156.441

  Chi-square table value:- 50.99846

- Comparison:-

  Here, Chi-square calculated > Chi-square table value

  $\Rightarrow$ Reject H_0 at 5 % Level of significance.

- Conclusion:-

It is therefore concluded that the objective No. 1 i.e. “The level of awareness of risks in managing the livestock and the remedial measures being adopted by the dairy farmers / Dairy Cooperative societies are appropriate” is positively proved.

CHAPTER –VI
OBSERVATIONS, SUGGESTIONS & CONCLUSION

6.1 INTRODUCTION

The researcher has made sincere efforts in presenting the primary data collected and has also interpreted the same in the earlier chapter. In this chapter further attempt has been made in recording the observations and has also enlisted practical suggestions wherever possible. While conducting this research the researcher has maintained a common thread between the objectives of research, hypotheses framed, data presentation, observations and the suggestions those emerged through this research. The researcher has also summed up the broad outcome of this research with reference to the attainment of the objectives as well as validation of the hypotheses. While conducting this research some issues have come up which can be further probed and further research can be conducted in respect of these issues. Such issues have been briefly stated in the scope for further research. Taking an overall view the researcher has concluded this thesis.

6.2 OBSERVATIONS

Following are the findings based on the interpretation of the data presented in Chapter V.

Relating to Milk Producers

a) 75.6% of the respondents have reported that the dairy activity has helped them in increasing their income level. It means that the dairy activity is certainly an activity allied to agriculture which helps the dairy farmers to supplement their income level. It will be worthwhile to state here that the dairy activity also provides employment to the villagers where disguised unemployment prevails.

b) It is observed that as high as 83.07% respondents have stated that apart from satisfying their own consumption needs of the milk, the surplus milk sold also fetches them sizable income.

c) It has further been been observed that the over whelming majority (96.4%) of the dairy farmers have reported that they get adequate F.Y.M. from their dairy activity which adds to the economic viability of their dairy activity.

d) 27.87% of the respondents have reported that they have biogas plant. 22.67% of the respondents have preferred to be neutral. 49.46% of the respondents are either disagreeing or strongly disagreeing with the statement that as they do not have biogas plant. . This is possible because those dairy farmers may not have minimum required dairy animals.

e) It has been observed that 86.7% of the respondents stated that their society gives them competitive rates for their milk supplies.

f) It has been observed that as high as 86% of the respondents have reported that the payment of sale proceeds of the milk supplied to the dairy society is made regularly.

g) Majority of the respondents (54.57%) have reported that they do not get prompt loan from the local bank branch for purchase of the dairy animals. This position needs to be further probed and the extension officer and block development officer should sort out this issue at the Block Level Consultative Committee meeting.

h) As high as 75.87% respondents have stated that they get advice from the dairy society for increasing the milk.

i) It has been observed that 80.53% of the respondents stated that since the establishment of the dairy in their village the villager's income level has gone up. It has also been observed that in the state of Maharashtra the farmer's suicides are more in the Vidarbha where the agriculture is solely dependent on the vagaries of monsoon and the farmers are by and large not pursuing any activity allied to agriculture like dairy. The Government of Maharashtra is now pursuing these farmers to start some economic activity allied to agriculture and is focusing on the establishment of dairies in this region. E.g. now Mother Dairy project has come in Vidarbha.

j) 65.47% of the respondents agreed with the statement that the dairy activity has led to the increase in the employment potential for the youth in the villages.

k) It has been further observed that 71.2 per cent of the respondents have at least part of their total holding has irrigation facility and that they are cultivating cash crops.

l) It has also been observed that 80.66% of the respondents have stated that their society organizes training programs for their members (dairy farmers). This is a good sign.

m) In addition 57.73% of the respondents have reported that they maintain separate accounts for the dairy activity. It shows that they are cost conscious of their business activity. Still 34.94% respondents do not maintain separate accounts.

n) Only 27.87% of the respondents have reported that they have biogas plant. All these because all the farmers may not have minimum required dairy animals to construct the biogas plant.

o) It will be in their own interest to maintain such separate account which will enable them to understand the outcome of their business activity.

p) It has further been observed that 60.53% respondents have confirmed that after the establishment of the dairy in the society, inflow of money has increased substantially and that the purchasing power of the villagers has also increased. This has resulted in organizing lots of welfare activities have started in the villages.

q) For maintaining the proper health of the dairy animals' guidance and support of the veterinary doctor is essential. The government veterinary doctors are visiting the villages for this purpose. It is observed by 60.53% of the respondents that the govt. veterinary doctors are regularly visiting their villages. In addition to these Gonvernment efforts, the Katraj Dairy also provides such veterinary support to the dairy farmers through their milk collection societies.

r) For maintaining the dairy animals successfully, it is necessary that the artificial insemination services are available in the vicinity of the villages. (Say about 5 Kms. radius). It has been revealed by 84.4% respondents that such services are available easily.

s) One of the requirement for maintaining the dairy animals is the availability of the cattle feed of good quality. If this is available locally the dairy farmers are

not required to move about, from the field study. It is observed by 76.67% respondents have confirmed that they get cattle feed supply from their dairy society.

t) It has been observed that 66.53% of the respondents have confirmed that chaff cutting services are available to the dairy farmers in the vicinity of their location. This processed fodder dry and wet certainly adds to the advantage of the milking animals.

u) It has been observed that 72.94% of the respondents are satisfied by milk collection arrangements.

v) Further it has been observed that 72.94% of the respondents have reported that they resort to retain part of the surplus generated from the dairy activity in constructing good quality shed/s for the dairy animals. This is a good sign of running the business.

w) It has been observed that 60.13% of the respondents either agree or strongly agree with the statement that the rate given by the private dairy societies is higher than the rate given by the Dudh Sangh. This situation varies from time to time. Because of the Govt. of Maharashtra's directions the case is presently reverse. The govt. of Maharashtra has constituted a committee to work out the modalities to decide the rate of the milk to be offered to the dairy farmer.

x) It is observed by 49.06% respondents that the sale proceeds of the milk supplied to the dairy society is credited to their bank account.

y) It is observed that 58.03% of the respondents have not insured their dairy animals. This is quite alarming figure. It means the general insurance companies have a lot to be done in this regard. Certainly it is in the interest of the dairy farmer to insure the dairy animals. There is need to create awareness about the ease and benefits from the insurance policy.

z) It has been observed that the incidence of cattle insurance is very low. Therefore, it will not be worthwhile to jump to any conclusion on the basis of the available data.

aa) It is observed that over whelming majority (84.26%) respondents have adequate water source to run their dairy activity efficiently.

bb) Besides 87.74% of the respondents agreed or strongly agreed with the statement that dairy activity enables them to have liquid cash to meet their day

to day requirements. Agriculture is a seasonal activity wherein they get money when their produce is harvested. This leads to a cash crunch for the agriculturists which problem is eased out by the dairy activity which make them available hard cash at regular small interval of a fortnight.

cc) In addition that 73.6% selected respondents have either agreed or strongly agreed that because of the profitability of the dairy activity the villagers are gradually increasing the strength of the livestock.

dd) It is observed that the highest percentage of 94.6% respondents have vouched that there is a very good demand for the milk and its products.

ee) Over whelming majority respondents (94.13%) have observed that because of the increase in the population as well as the purchasing power of the masses the demand for value added milk products has increased.

ff) It is further observed that during the past five years period the per head consumption of milk has increased. This view has been expressed by 76.13% of the respondents.

gg) In the urban area there is a demand for good quality milk supply and that they are willing to pay higher price for it. This view has been expressed by 93.33% selected respondents.

hh) It is observed that during the festival season there is a greater demand for the milk and the milk products. This has been expressed by 96.26% of the respondents who have agreed or strongly agreed with the statement.

ii) 89.33% selected respondents have confirmed that if the dairy activity is managed commercially it fetches good return.

jj) 77.47% of the respondents have confirmed that the dairy activity in their family is being managed by the female members of the family.

kk) It is observed by 61.23% of the respondents that they either disagree or strongly disagreed with the statement that now the raising bank loan is easy and that the rate of interest charged is also low.

ll) 57.74% selected respondents have expressed that they have shown their intention to expand their dairy activity by purchasing additional cattle. There is need to educate the dairy farmers about the profitability of the dairy activity, availability bank finance, etc. so they will be motivated to buy additional dairy animals.

mm) It is observed by 78.66% of the respondents have stated that being a member of the dairy society they get guidance from the society for maintaining the dairy animals.

nn) Further it is found that the managing committee of the dairy society understands the member's problems in right perspective and that they try to solve those problems. This has been stated by the 85.6% of the respondents.

oo) It is observed that the dairy societies have made arrangements to supply cattle feed as well as the medicines required for the livestock. This was the feedback given by 70.67% of the respondents.

pp) Majority of the respondents (72.27%) have stated that their society should deduct the loan installment from the sale proceeds of the milk from time to time and credit it directly to their loan account with the financing bank.

qq) In addition majority of the members 80.80% selected members have either agreed or strongly agreed with the statement that deduction of the loan installments from the sale proceeds of the milk supplied and depositing it to the loan account by the society from time to time will give the members relief in interest charged by the bank.

rr) Majority of the members (79.73%) have expressed that the society staff should extend them assistance in putting insurance claim with the insurance company and to chase it for its early settlement. The expectation is quite normal.

ss) From the field study it is seen that a frequent interruption in power supply which poses hardships to the dairy farmers. Over 91% of the respondents have stated that there should be improvement in the power supply and it should be without any interruption.

tt) 79.47% respondents have either agreed or strongly agreed with the statement that they are getting competitive rates for the milk supplied by them to the dairy society. At present the dairy farmers supplying the milk to the dairy societies are getting better rate even as compared to the private dairy organizations. Besides the rate given for the milk, the dairy farmers supplying the milk to the dairy society, they also get at the end of the year 'price difference' which adds to their income.

uu) It is expressed by the majority of the members (91.6%) expect that the society should provide them information relating to the various government schemes

concerning the dairy activity so that the members may take benefit of those schemes.

vv) Further it is expected that the members of the dairy society should buy the inputs like cattle feed and the commonly required medicines for the livestock and make those available to their members. This was the view of 93.8% of the respondents.

ww) It is observed that majority of the dairy farmers are unaware of the various types of semen available in the market. As a result they are solely dependent on whatever the semen the veterinary staff uses. If proven quality semen is used, naturally it will have a long term effect on the quality of the cattle and its milk production.

xx) Majority of the selected respondents (77.07%) are aware of the benefit of the regular medical checkup of their livestock and that they observe it strictly.

yy) It has been found that majority of the respondents (89.87%) do follow hygienic precautions while milking the cows or while supplying the milk to the dairy society.

zz) It is observed that the dairy societies conduct training programs for their members. This has been stated by a majority of the respondents (93.6%).

aaa) Majority of the selected respondents are in agreement with the statement that there are apart from increase the cattle size, ways and means through which the milk production can be increased.

bbb) 83.33% selected respondents have earmarked a part of their agricultural land for cultivation of green fodder which is a vital input for milk production.

ccc) It is found that majority of the respondents (91.6%) are aware of the importance of maintenance of cleanliness in the cattle shed.

ddd) It is found that majority of the respondents (82.93%) are aware of the need to keep the cattle shed cool during summer using various techniques such as use of sprinklers on the roof top during the hot Sunshine.

eee) It is found that a majority of the respondents 52.7% respondents were aware of the variety of the semen and that they use high quality semen, irrespective of the cost consideration, for improving the production of milk.

fff) It is observed that majority of the respondents (85.86%) are traditional farmers and that they have adequate knowledge about precautions to be taken on the health and management of the livestock.

ggg) During the artificial insemination operation extra precautions are required to be taken. 57.6% of the respondents have the knowledge of those precautions.

hhh) It is found that majority of the respondents are aware of the care to be taken during the pregnancy of the cattle.

iii) It has been observed that majority of the respondents (92.54) observe cleanliness while conducting all the dairy operations.

jjj) Majority of the respondents give periodical vaccination to their cattle and that they stand to benefit by that.

Relating to the Dairy Coop. Societies

a) It has been observed by 76% of the respondents have confirmed that their society organizes training programs for their milk pourer (supplying) members.

b) Only 40% of the respondents have stated that their society assists the financing banks for recovery of their loans through payment of sale proceeds. At the same time it shows that one of the reasons for not promptly considering the dairy loan proposals by the bank is non-cooperation of the societies in their recovery efforts.

c) It is found from the field study that 78% of the respondents either agreed or strongly agree with the statement that there is a fair competition amongst members of the society to increase the milk supply.

d) It is observed that there is a fair competition amongst the societies in Taluka for maximum collection of milk. (64%). The district Dudh Sangh (Katraj Dairy has instituted a prize for highest collection which motivates the societies to increase their milk collection.

e) It has been observed that there is delay in the settlement of the cattle insurance claims by the insurance companies. 48% of the respondent societies have either disagreed or strongly disagreed with the statement.

f) It has been found that hardly 22% of the societies have reported that the banks are sanctioning dairy loans promptly. Similar view is also expressed by the

dairy farmers on this statement. It means that there is delay in according sanction to the dairy loan proposals by the branches. Dairy loans are relatively small loans and bank branches are authorized to sanction these loans. Therefore, this issue can be sorted out without much difficulty.

g) It is observed by 94% of the respondent societies that they provide the government schemes in operations relating to dairy activity to their members. But on a similar statement 90% of the respondents have expressed that the societies should inform the members about the Government schemes in operation. It means the responses are contradicting and therefore, a suitable suggestion has also been incorporated herein below.

h) 74% responding dairy societies have stated that their suggestions for any improvement in the functioning of the society are taken well care of by the banks as well as the district dairy union.

i) It is observed that 76% of the dairy societies have willingness to make provision of cattle feed and routine medicines required for the livestock to ensure supply of quality feeds at reasonable costs and at the same time make some earnings from the bulk buying of those inputs. Some of the societies are already attending to this supplementary requirement of the members.

j) It is further observed that there is a good rapport between the District Dairy Union (Katraj Dudh Dairy) and the primary dairy societies. This is revealed from the fact that 86% of the responding societies stating they get good cooperation from Katraj Dudh Dairy for sorting out their problems and for increasing the milk supply. This is a good position and the same should be strengthened further for mutual interests.

6.3 SUGGESTIONS

During the course of this research and the findings that have come to surface, some suggestions for improving the situation have been crystalized and those have been presented in the following paragraphs. The suggestions have been classified for the clarity purpose on the basis of stakeholders of the dairy development activity in the rural areas.

Stakeholder: Dairy farmer

a) In view of the fact that the biogas plant can generate required energy for cooking and for domestic lighting, it is suggested that those farmers who are currently not having biogas plant installation may be encouraged to go in for biogas which will enable them to get gas as well as light at no cost. The government does give subsidy for the installation of biogas plant. The dairy activity has turned out to be a profitable economic activity and hence the farmers who do not have bear minimum required dairy animals may go for purchase of requisite dairy animals for which finance is also available from the banks in the rural area. Alternately, those farmers who do not have minimum required number of livestock for construction of gobar gas plant can come together and have a community gobar gas plant and make use of the energy generated. This is possible because of the proximity of the residences in the villages.

b) It is suggested that the dairy farmers who have part of their land under irrigation should also cultivate quality green fodder at least for their own requirement so that the assured good quality green fodder will have positive impact on the milking of their cows / she buffaloes. Here it will be appropriate to make a mention that in a recent telecast on digital media, it has shown that some youth have started cultivating specifically for the milking animals quality green grass and they are getting good remuneration from the activity.

It will be worthwhile to make a reference to the fodder banks operating in the villages. In such cases those agriculturists who do not have cattle but has surplus fodder maintains a fodder bank and sales the fodder either against cash or against milk supplied.

c) It has been revealed from the field study that still a large portion of the dairy farmers do not maintain separate accounts for the dairy activity. In order to understand the areas to control the costs such account writing is very much helpful. Therefore, the dairy society as well as during the training programs should give thrust be given to this issue and the dairy farmers be made aware of the benefits of such maintaining the separate accounts for the dairy activity.

d) The dairy sector is the backbone of the rural economy which helps the rural economy to grow at a faster rate. The dairy farmers are not well equipped with

the scientific knowledge for conducting the activity. They are pursuing the dairy activity on the traditional lines. Therefore the need of the hour is to see that the dairy farmers are required to be properly inducted with the basic scientific knowledge. The Dairy Union at the district level in collaboration with the Animal Husbandry Department at the district level should prepare a capsule program for the grass root level dairy farmers and create awareness amongst them to pursue the dairy activity on the scientific lines so as to ensure its sustainability and increasing the clean milk output.

e) After a reasonable gap, these farmers be also given orientation training of short duration and enhance and update their knowledge in increasing the milk production of the livestock. A brief skeleton of these training programmes have been prepared and are incorporated in this thesis as Annexure III and V. This can very well serve the back ground for a detailed debate amongst the expert in Livestock management, Accounts People, Insurance representatives and refine the training program. These programmes be held with local medium of instruction. (Marathi/ Kannad as the case may be).

f) The feedback received has indicated that there is scope for increasing the dairy activity and 57.74 % of the respondents are intending to enlarge their dairy activity. This will help the dairy farmers in increasing his income base and at the same time his efforts in adding the milk production will be helpful to address the situation of the malnutrition.

Stakeholder: Village Milk Producers Coop. Societies

a) It is suggested that the dairy societies should also motivate the dairy farmers to go in for purchase of additional dairy animals and install biogas plant at the place where the dairy animals are housed. As an organization the dairy society's officials can take a lead in this regard and approach the govt. extension officials in the block to push up their biogas plant scheme in the villages.

Here it will be worth mentioning that the new technology has been now put in practice in some part of India where the biogas generated has been filled in the cyllinders and is sold for which there is ample demand.

b) In fact dairy society is an organization in the village which has control over distribution of the sale proceeds of the milk supplied by the members of the society. It is something like performing corporate social responsibility on the lines of the corporates, under the 2013 Company Act amendment. In fact the same provision is in the Cooperative principal this provision is already there under the title "Social Concern". The society can chalk out a program of activities those can benefit the village and with the proper authority from its members collect nominal amount from out of the milk sale proceeds and adding a part of their profit can certainly undertake small projects beneficial for the village itself. E.g. toilets in the schools, establishment of library, health checkup camps, awarding the talented students securing highest marks in the 10^{th} and 12^{th} standard which will motivate the other students, etc.

c) Cattle feed is a major requirement of the dairy farmers. At present number of societies do make arrangements for the supply of cattle feed to their members and deduct the charges from the sale proceeds of the milk supplied by the member. The researcher is of the view that in every Taluka the dairy milk societies can come together and start their own cattle feed manufacturing unit so that they can ensure good quality cattle feed is available for their members at still cheaper rates. This will also be a cooperative venture. It will provide employment opportunities to the youth in the rural areas both direct and indirect employment.

Here it will not be out of place if a reference is made to a new concept of giving quality mark to the dairy feed – an initiative taken by NDDB. If this system stabilizes the quality of the dairy feed will be ensured and it will benefit the farmers.

d) In view of the fact that the Govt. of India is encouraging cashless transactions as also to inculcate the habit of banking amongst the villagers it is suggested that the Dudh Societies should also make payments to the supplier's bank account. Now with the government initiative for opening up of the bank accounts under Jan Dhan Yojana almost 83.5% of the farmers have opened up their accounts. This facilitates the government to route its subsidy elements directly to the dairy farmer. Similarly it will help the Primary Milk society to

release their sale proceeds through these accounts and it will be a part of encouraging cashless transactions aimed by the government of India.

e) It is suggested that the Cooperative Dairy Societies can do a lot in respect of insuring the dairy animals. The insurance companies should explore the possibility of extending agency to these societies and make these societies a business associate in capturing the insurance business. The insurance companies may take up this opportunity to explore the possibility of selling their other insurance products.

f) The Dairy societies should create awareness among the dairy farmers about the benefits of the insuring the dairy animals. During the training programs organized for the society members they may also invite faculty from the insurance companies to educate and explain the insurance policy benefits to the dairy farmers.

g) It is suggested that society authorities should ensure that one of the staff member of the society be trained by for training provided by the insurance company for putting up the insurance claim in case of the death of the dairy animal and to chase the claims until its settlement. This will be a great service to the uneducated members of the society.

h) It is necessary for further improving the economic conditions of the dairy farmers, increasing the milk production is the solution. For this purpose the dairy farmers be educated to increase the number of dairy animals for which bank finance is available and that the activity is profitable. The dairy societies may in their regular meetings with the members motivate the farmers to purchase additional dairy animals.

i) The state Government launches various schemes for the development of the dairy industry on sound lines and provide subsidy element under the schemes. Therefore, the dairy society should keep with it upto date information about such schemes and make its members aware of such schemes so that they can take benefit of the same. This will also be in the interest of the dairy society. E.g. the state government was bearing part of the insurance premium in one of the year under study but this was not known to the members of the society.

j) The dairy society may educate the dairy farmers about the various types of the semen available in the market and also ensure good quality semen even though

it's slightly costing higher. Only after the awareness they will be using good quality semen and the quality of the dairy animal and the milk production will have a positive impact.

k) Now because of heavy inroad of computer technology it has reached the interior part of Maharashtra. Number of new software are in the market which facilitate data compilation and without much difficulties and avoiding additional work, the data generated through Management Information System can be used for taking meaningful decisions. The management of the village level milk producer's dairy societies may be imparted training as to how to interpret the data for the benefit of the dairy management and can initiate remedial actions. Workshops for the village level society's staff should also be imparted training and their notions may be refined which will reflect on their productivity.

The government of India has thought of a scheme to introduce Aadhar Card for the livestock through which the moments of the livestock will be monitored as well as its health record will be kept in this account file. However, this move needs to be given booster so that in another 5 years this giagintic task can be achieved.

l) From the findings it is revealed that by and large the dairy societies are not co-operating with the financing banks for recovery of their dairy loans from the dairy farmers from out of their sale proceeds of the milk supplied to them. In fact the societies should cooperate with the financing banks in this regard to fulfill their mutual interest. If the society cooperates with the banks in recovery, naturally the banks will also come forward to extend speedy dairy loans. Therefore, the Pune District Central Cooperative Bank Ltd. should direct the dairy societies to assist the bank in their recovery efforts.

m) In view of the feedback so far as delay in payment of cattle insurance claim settlement the researcher suggests that there is a need to have a dialogue between the insurance companies and the dairy societies and the problem if any should be sorted out and a system wherein the insurance claims need to be evolved. Here the researcher would like to state that at the initiative of Katraj Milk Dairy – the district level union, a meeting of dairy societies, insurance companies and the Katraj Dudh Dairy was convened and the issue was

discussed thread bear. Now a solution has been arrived at and it is hoped that the system will get streamlined and the undue delay in the settlement of the cattle insurance claim will be promptly settled.

n) In order to sort out the issue of delayed dairy loan sanctioning by the branches of the bank, it is suggested that Katraj Dairy may in its meeting with the dairy milk societies discuss the issue with them and get appraised of the grass root position and may take up the issue with the lead bank of the district i.e. the Bank of Maharashtra and request them to take up the issue in their quarterly District Level Consultative Committee meeting wherein the bankers as well as the government authorities are present. The Lead Bank may invite the Katraj Dairy Representative for such a meeting and a solution can be worked out. Apparently the delay appears to be because of the non-cooperation of the dairy societies in the recovery of dairy loans given by them. This is the feedback given by the dairy farmers. The issue can be sorted out by mutual discussion and streamlining the system.

o) It was revealed that there is a contradiction in the responses of the dairy farmers and the dairy societies relating to giving information about the government schemes pertaining to the dairy activity to its members. It is therefore suggested that dairy societies should invite the Agriculture Extension Officer at the block level, at least once in a half year in their meeting who should brief about the Government schemes relating to the dairy activity to the members of the society so that they can take the benefit of those schemes. For the Extension Officer, it is a part of his duty.

p) Now there is a well-knit network of the dairy societies in each Taluka. The number of dairy animals is quite sizable and it is showing a growing tendency. In order to ensure that the dairy farmers in the Taluka get the cattle feed of good quality and at reasonable rates, it is suggested that the societies operating in the Taluka can come together and start a small cattle feed manufacturing plant which will apart from the quality cattle feed at reasonable costs, it will also ensure generation of rural employment. The society may sell it to the nonmembers also and earn a good profit. It is suggested that the District Dairy Unions should take a lead and motivate healthy and progressive dairy to go in for this activity which will have demonstrative effect for the other Talukas.

q) In connection with the insurance of the livestock the researcher had a detailed interaction with the Insurance Company's senior officials during which it was transpired that there is a communication gap between the insurance companies and the dairy utpadak Coop. Societies. The insurance companies are willing to give training to the society's staff and also offer agency to the dairy society for insuring the livestock. This will fetch income to the society as well as the members will also be benefitted of the insurance services. For this purpose the District Dudh Utpadak Coop. Sangh (Katraj Dairy) Pune is willing to take initiative for Pune District. Such initiative can also be taken by the other District Sanghs so that insurance cover will be available to the dairy farmers for their livestock.

Stake holder: The State & Central Government

a) It is suggested that in view of the further scope for the dairy as well as installations of biogas plants in the rural area, the government should take vigorous follow up of the biogas plant scheme for power generation and may make the subsidy available without any details which will attract the dairy farmers to participate in the program. The power generation through biogas plant is not only source of generation of power through non-conventional sources of energy but also from the remaining waste which can be further processed for economic gains too.

In this regard the researcher is of the considered view that this biogas projects can also contribute to the success of the Swachha Bharat Abhiyan. So also the possibility of connecting the toilets constructed in the rural areas be also connected to the biogas plant so that the rairy farmer will have rich quality of organic fertilizer and at the same time will address the objective of Swachh Bharat Abhiyan.

b) It has been observed that the dairy farmers find it difficult to get loan for purchase of the dairy animal from the local bank branches. Therefore, it is suggested that the state government should direct the Block Development Officers and the Collectors who are chairing the Block Level & District Level Consultative Committee Meetings respectively to take up this issue in their

quarterly meetings and sort out the dairy farmers' problem of getting prompt loan for dairy purpose.

c) The National Bank for Agriculture and Rural Development (NABARD), the Reserve Bank of India and the Govt. of Maharashtra should take urgent steps to see that raising the bank loan for dairy purposes is made easy and that too at concessional rate. Being a priority sub-sector (activity allied to agriculture) the rate of interest is relatively low but an attempt be made to further reducing the rate of interest at least for those who are from the weaker section of the society.

d) During the course of this research it has been observed that both Central as well as the State governments have introduced several dairy development scheme but at the grass root level it has been observed that there is no much awareness about these schemes. Therefore, the need of the hour is to see that the Central and State Govt.'s should with the involvement of all the stakeholders in the dairy activity, massively campaign using digital media and participating in the village level annual fairs to increase the awareness amongst the dairy farmers so that they will be benefited in which also lies the mutual benefit to the dairy industry as a whole.

The researcher would like to point out over here that the Primary Dairy Society is such an organization which is visited by the dairy farmers every day and therefore the Government of India as well as the State Governments should make use of this situation to popularize their various development schemes so that people's participation can be ensured.

e) The government should direct the Maharashtra State Electricity Distribution Co. Ltd. to ensure uninterrupted power supply even in the rural areas.

f) At present there is no system of maintaining record of the death of the livestock in any of the office. In the absence of the data as to the number of deaths, most common causes of death, and allied matters; it is difficult for the Animal Husbandry Dept. as well as the insurance company which provide cattle insurance cover to plan their operations on sound lines. It is therefore, suggested that on the lines of the death of human beings there should be proper record be maintained at the Villagle Grampanchayat and the data so collected may be made available to the above departments.

g) Keeping in mind the employment potential of the dairy activity and its scope, which encompasses maintaining the dairy animals, insurance, cattle feed manufacturing and marketing, marketing of innovative dairy products, this dairy activity may be focused under the government of India's Skill Development Scheme.

h) So far as human being considered the government is very much conscious of balanced development of the sex. As there is an imbalance in this regard the government has initiated Beti Bachav Campaign. Once the government is convinced about the need for the balance growth of the human being similar need is also have to be visualized and the male cattle need to be protected. At present the scientists are working on projects which will ensure only the female calf using sexing semen. This may in turn lead to disaster.

i) The government may utilize the dairy activity for doubling the farmer's income by 2022.

j) The Government of India may also explore the possibility of promoting products innovation using Panchgaya (the cow dung and urine, milk, cruds and ghee) and seek patents for the Ayurvedic Products to capture World market under Make in India mission.

6.4 VALIDATION OF HYPOTHESES

The hypotheses initially formulated have been put through a statistical analysis using Annova and Chi-square test and all of these hypotheses have been tested satisfactorily. The detailed working of the tests applied has been given in the chapter 5.

6.5 SCOPE FOR FURTHER RESEARCH

While conducting this research, the researcher had kept one eye on the emerging areas where the further research can be conducted. There are number of developmental scheme in the diary sector launched by both Central and State Governments.

1. Therefore, it is suggested that one area that comes up to researcher's mind is the Critical Appraisal of the various Central and State Government's dairy

development schemes in the State of Maharashtra". This study will be very much useful for the dairy sector which is having tremendous potential for the development in times to come.

2. Even research can also be conducted by undertaking comparative working of the District Milk Unions so that best practices introduced will come to surface which can be immolated by the other District Milk Unions.
3. Taking into account the need for costing exercise for the dairy farmers in different regions and for different varieties of animals a research will be helpful to educate the farmers in minute details.
4. Considering the availability of the milk production, the per capita consumption of the various states give an impression that there is very good potential for taking a research to identify areas through which the per capita consumption of milk and its products can be increased. E.g. Mid day meal scheme for the students can be one such avenue.

6.6 CONCLUSION

There is large scope for dairy and food industry to grow further in view of the globalization and increasing purchasing power of consumers. The "National Dairy Plan (NDP) "a World Bank funded project, envisages increasing productivity of dairy animals through provision of good quality semen, door step AI services and scientific feeding practices.

Dairy farming is a business; a very demanding business. A successful dairy farmer has to handle sensitive biological processes in lactating animals and growing plants. He has to handle delicate health and hygiene matters together with advanced machinery and software. Further, he has to make financial decisions and supervise employed personnel. Farming is a business that runs 24 hours a day, year round and it does not take a break for holidays. It is a rewarding business when you see animals and plants are develop and grow and feel that owner can be part of this system that provides good nutrition to fellow people, while making a reasonable financial return for all your efforts.

Dairy farming is not a way of living, but a profession, providing a good life for a skilled business manager.

India today is in an advantageous position of having the necessary skills, manpower and infrastructure to process milk across the country and has a fast growing private sector with their own funds.

There is a seasonal variation in the quantum of milk production with a near constant but growing milk consumption enables the industry to produce the skimmed milk powder in the flush season and use it in the subsequent lean season.

Here it will be appropriate to record what Shri Dilip Rath – Chairman NDDB, observed while addressing the delegates at the IDF World Dairy Summit in Rotterdam, the Netherlands held during 17-21 October 2016. Shri Rath said that three factors contributed to this phenomenal growth of dairying in India. First, is the creation of a robust and sustainable farmer owned and controlled institutions, which gave market access to small holders and made the small holder system a viable business mode. Secondly, adoption of policy for breed improvement of various indigenous breeds retaining valuable climate resilient traits of heat tolerance and disease resilience while resulting in higher yields. Third, efficient use of food by – products and agro industrial residue based balanced feeding system without significant use of resources required for production of human food.

If the dairy industry is to survive in the ever-increasing global competition and excel in its quality and safety approach it has to seriously think of reorienting the paradigm shift.

BIBLIOGRAPHY

PREVIOUS RESEARCH

Research Papers

1.	Dr. Harsev Singh (2009), article titled "Ensuring Quality Assurance at Dairy Farm Level". Published in the conference proceedings of National seminar on Food Safety & Quality Issues in Dairy Industry, organized by National Productivity Council, Pp 26-31
2.	Nilofer Shaikh, (2010), research paper titled, "Marketing of Cooperative Products Challenges & Remedies". Published in the national seminar on Cooperative Movement in Globalized Scenario, organized by Dr. D. Y. Patil Center for Management & Research during 29th to 31st March 2010.
3.	A. K. Misra and A. R. Sirothia (2013), presented a paper titled, "Present Scenario of Dairy Cattle Breeding in India: Time to Review and Revisit, published in the proceedings of 41st Dairy Industry Conference & IIDE 2013.pp 31 to 39.
4.	Subhash, B. Surendra Nath and Satish Kulkarni, (2013), presented a paper titled, "Human Resource Requirements of Indian Dairy Industry: An Overview". , published in the proceedings of 41st Dairy Industry Conference & IIDE 2013.pp 31 to 39. , published in the proceedings of 41st Dairy Industry Conference & IIDE 2013.pp 44 -49.
5.	Bandyopadhyay AK, Ray PR, Ghatak PK 2012. Dairy Education – A critical Appraisal. Indian Dairy Man. 64 No. 10, 68-71.
6.	Mangesh G. Mankar and P. K. Dixit (2013) Paper titled, "Dairy farming in drought prone and non-drought prone areas in Maharashtra – an economic perspective". published in the souvenir of 41st Dairy Industry Conference & IIDE 2013.p 117
7.	A. N. Dange, S. R. Ghongade, V. S. Lande, P. G. Kokare, P. Yewale, R. D. Kokane (2013), presented a paper titled, "Changes in climate and its impact on Milk Productions". published in the souvenir of 41st Dairy Industry Conference & IIDE 2013.p 129

8.	Anjali Kumari, Ranjana Sinha, Ritika Guta, P. Manjari, Purnima Singh (2016), in their paper titled "Eco-friendly Dairy Wste management Technologies" published in Livestock Line, Volume 10, Ussue 7, November 2016, pp. 42-45
9.	Pragya Bhadauria, Arvind Kumar, Preeti Mamgai and Y. S. Jadoun (2016),[1] article titled, Nutritional Management of Dairy Animals during Transition Period for Prevention of Lameness", published in Livestock Technology, December 2016, Vol. 6, Issue 7, pp. 14-16.
10.	D. Ramasamy, R. Chandrakala, C. Prem Anandh, A. Surendraraj, T. Sivakumar (2014|) article titled, "Community Cattle Care Centre – (CCCC) An Opportunity for Landless Livestock owners", published in Dairy Planner, Vol. 10, Issue No.6, February 2014, pp. 4-6.
11.	Abhilasha Singh, Deepika Tripathi, Srobana Sarakar, Amit Sharma (2017) wrote an article titled, "Feeding Strategies for Livestock During Natural Calamities", published in Livestock Technology, Vol. 6, Issue 10, 7th march 2017, pp. 14-16
12.	Priyanka Lal,Binita Kumari, Priyanka Singh (2017), article titled, "Second White Revolution: Changing Paradigm of Dairying from Subsidiary to Mainstream Occupation", published in Livestock Technology, Vol. 6, Issue 10, 7th march 2017, p. 18
13.	Central govt. letter regarding Animal Hostel Model, bearing No. DO.No.22-18/2016-DP dated 14.10.2016
14.	M. Njavro (1), V. Par ,Draženka Pleško , (2008). In their research paper titled, "livestock insurance as a risk management tool on dairy farms"
15.	David Jakinda Otieno, Willis Oluoch-Kosura, , Joseph Thuo Karugia, Adam Drucker, Edward Rege (2006), in their paper titled, "Risk Management in Smallholder Cattle Farming: A Hypothetical Insurance Approach in Western Kenya", Presented at the 26th International Association of Agricultural Economists Conference, Gold Coast, Australia, August 12–18, 2006

16.	Dwaipayan Bardhan, Y. P. S. Dabas, S. K. Tiwari and Avadhesh Kumar (2006), in their paper titled, "An assessment of risk attitude of dairy farmers in Uttarkhand" paper presented at International Conference in Australia in August 2006.
17.	M. Njavro (1), V. Par ,Draženka Pleško, (2008). In their research paper titled, "livestock insurance as a risk management tool on dairy farms" Presented at the 26th International Association of Agricultural Economists Conference, Gold Coast, Australia, August 12–18, 2006
18.	Christian Schaper, , Birthe Lassen, and Ludwig Theuvsen[1] (2009), paper titled, "Risk Management in Milk Production: A Study in Five European Countries" presentation at the 113th EAAE Seminar "A resilient European food industry and food chain in a challenging world", Chania, Crete, Greece, date as in: September 3 - 6, 2009
19.	Prof. M. L. Madan, (2017) "Challenges in Livestock and Poultry Production – Solution with Biotechnology" XXIII Annual Convention of Indian Society for Veterinary Immunology and biotechnology and National Conference on "Challenges in Livestock and Poultry Production – Solutions with Biotechnology", Key note address. Available in Compendium cum Souvenir.

Books &Periodicals

1.	Shakti Ranjan Panigrahy, Sanjiv Kumar, Arpita Mohapatra[1] (2016), article titled, "Cattle Insurance – An Insight for Cattle Owners", published in Livestock Technology, Sept. 2016 Vol. 6,Issue 4, pp. 18-20.
2.	DeLaval: Dairy Farming Handbook /Chapter 7,pp
3.	Dr. Kumar Kore, AB Vista South Asia, (2017), article titled, "Feed Safety – How safe are we?", published in Think Grain, think feed, monthly magazine for Feed Technology, Volume 3, Issue 3,January 2017, pp 12-14.

4.	P. K. Naik, R.B. Dhuri, M. Karunakaran, B. K. Swain and N. P. Singh, (2013) , article titled, "Hydroponics technology for Green Fodder Production", published in Indian Dairy Man, March 2013, pp 54-58.
5.	Niharika Thakur and Parminder Singh (2017)[1], article titled, "Role of ICT in Management of Livestock Farms". Published in Livestock Technology, July 2017 Vol. 7,Issue 02, pp. 18-22

Journals

1.	Shri Deelip Rath (Chairman NDDB), (2016), while addressing the delegates at the International Dairy Federation, (IDF) World Diary Summit in Rotterdam, the Netherlands held during 17-21 October 2016. Available in the Diary November 2016 issue of NDDB's News Magazine.

News Paper Articles & News

1.	Basu, T., 2015, Surplus powder stocks to keep milk prices stable in North, The Hindu Businessline, Kasturi & Sons.
2.	Krishnamoorthy, R., 2015, Crashing prices of skim milk powder worries farmers, The Hindu, Erode, Kasthuri & Sons.
3.	Dairy Times (Nov. – Dec. 2017), news item titled, "Milk production in India grew by 6.7% in 2015-16; Radha Mohan.
4.	Sakal, Tuesday 20th June 2017, **"**Increase in the milk procurement price by Rs.3/- p.ltr."
5.	Janshakti Pimpri-Chinchawad, dated 13th July 2017, "Private dairy organizations are grabbing dairy farmers".

Websites

	https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Dairy%20and%20Products%20Annual_New%20Delhi_India_10-11-2013.pdf retrieved on 25th March 2017
	The National Dairy Development Board (NDDB) http://ww.nddb.org
	http://lexicon.ft.com/Term?term=risk-management visited on 10th May 2017.
	https://www.yesbank.in/pdf/dairy_farming_in_india_a_global_comparison.pdf visited on the 11th May 2017

ANNEXURE -1

Questionnaire for the dairy farmers

(Please tick ✓at the appropriate options provided)

1. Name in full _____

2. Name of the village: _____ Taluka _____

3. Educational qualification

Illiterate	Upto 12th Std.	Diploma	Graduation	Post-graduation

4. Occupation:

Agriculture	Exclusively Dairy	Service	Business	Any other please specify

5. Please state to which category you belong to:

Marginal	Small	Semi Medium	Medium	Large	Do not hold any land
Land holding less than 1 Ha	Higher than 1 Ha but less than 2 Ha.	Higher than 2 Ha but less than 4 Ha	Higher than 4 Ha but less than 10 Ha	Over 10 Ha.	

5. Are you a member of any dairy society? Yes ☐ No. ☐
If yes, name the dairy society: _____

6. Since when are you maintaining the dairy animals? Since ☐ years.

7. Details of animals held:

Non Descript		Crossbreed cows				Pure Deshi (Indigenous) Cows					
No.	Milk LPD	H.F.		Jersey		Khilar		Gir		Other	
		No.	Milk LPD	No.	Milk LPD	No.	Milk LPD	No.	Milk LPD	No.	Milk LPD

Details of buffalos

Non-Descript		Buffaloes					
No.	Milk LPD	Murrah		Pandharpuri		Other	
		No.	Milk LPD	No.	Milk LPD	No.	Milk LPD

8. Type of housing arrangement for the dairy animals.

Brick work	RCC structure	Temporary bamboo structure

Mode of housing:

Free Housing System	Tail to Tail	Head to head

9. What is the water source for the family?
Dug well ☐ Irrigation outlet ☐ Village scheme ☐

10. Your **annual** income from each activity:

	Less than Rs.1 lakh.	Rs.1 lakh to Rs. 5 lakhs	Over Rs.5 lakhs to Rs.10 lakhs	Over Rs.10 lakhs
Agriculture				
Dairy activity				
Any other activity Specify				
Total				

Payment of milk sale mode and frequency: (cover society as well as private purchaser)

Mode	In cash	By cheque	By credit to bank account	Is there any system of advance payment
				Yes No.
Frequency	Weekly	Fortnightly	Monthly	

11. Nearest A. I. Centre is at : _____ (approximate distance __ Kms.)

12. Veterinary services are regularly available from : _____.

13.

In the following table certain statements are made relating to your dairying activity. Please put tick mark at the option of your choice.

Sr. No	Statement	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**	**Total**
		1	**2**	**3**	**4**	**5**	
1	My dairy activity has over the years helped me to step up my income level						
2	Apart from my domestic milk requirement I earn sizable income from dairy activity.						
3	My dairy activity fetches adequate FYM for agricultural operations.						
4	I am having a biogas plant in the campus of my residence.						
5	My dairy society offers me competitive rate.						
6	I get regular payment from the society						
7	I get prompt loan from the local branch of the bank.						
8	I get advice from the dairy authorities for increasing the milk						
9	Since establishment of the dairy society the overall income level of the villagers has increased.						
10	The dairy activity has given employment to number of youths in the village.						
11	I have part of my land under irrigation and it has helped me to take up cash crops.						
12	Our society organizes training programmes for the dairy farmers.						
13	I maintain my dairy activity accounts separately.						
14	After the dairy society has come into being there are lots of changes in our village as we can now afford to pay for the welfare of the society.						
15	The Govt. Veterinary Doctor visits our area regularly.						
16	A.I. centre is within a radius of 5 Kms. from our village.						
17	We get cattle feed from the Village Milk producers Society of which I am a member.						
18	There is chaff cutter machine in the vicinity which offers services to us.						

19	The milk collection arrangements are satisfactory.						
20	From out of dairy income I have been able to construct cattle shed of good quality.						
21	The rate given by the private dairy is higher than the rate offered by the Dudh Society.						
22	The payment of the sale proceeds of the milk supplied to the Society is credited to our savings bank accounts.						
23	I have insured my cattle stock with the insurance company.						
24	I had an occasion to put up an insurance claim and my experience of claim settlement is satisfactory.						
25	I have adequate source of water to meet the water requirement of the dairy activity.						
26	The dairy activity enables us to have liquid cash for our day to day requirements.						

Sr. No	Statement	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**	**Total**
		1	**2**	**3**	**4**	**5**	**6**
1	Gradually the villagers are increasing their livestock population as the dairy activity is profitable.						
2	According to me there is very good demand for the milk and milk products.						
3	With the increase in population and the paying capacity of the masses there is a greater demand for the value added milk products.						
4	Compared to past five year's our own consumption of milk per head has increased.						
5	In the urban area there is scope for supplying quality milk for which the people are willing to pay higher prices.						
6	During festival season there is a great demand for the milk and milk products.						
7	If we manage the dairy commercially, the activity results in reasonable profit.						
8	The dairy activity in our family is being managed by the female members from the family.						
9	Now obtaining a loan for the dairy activity is hassle free and at relatively low rates.						
10	I intend to purchase cattle for enlarging the size of my dairy farm.						

Sr. No	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
		1	**2**	**3**	**4**	**5**	**6**
1	As I am a member of the local milk producer's coop. society I get guidance from the society for maintaining my dairy animals.						
2	Our society managing committee understands our problems in right perspective and extends every help to us.						
3	The society has arrangements for supply of cattle feed, medicines required for the livestock.						
4	I am of the view that our society should deduct its loan installment from our periodical sale proceeds of milk on prorate basis so that we do not have tension at the end of the year.						
5	Payment of regular installments from the sales proceeds of milk regularly will also reduce the interest burden.						
6	I feel that the society staff should assist us in putting up our claim with the insurance company for early settlement of our claim.						
7	There should be uninterrupted power supply to our village for smooth running of the dairy activity.						
8	Until I am made aware as to how the final rate of our milk supply is arrived at, I was carrying an impression that I am not getting competitive rate.						
9	The society should arrange to inform the members the govt. schemes in operation relating to the dairy activity so that we can take benefit of the scheme.						
10	If the livestock feed and the commonly required medicines are made available through the society (enjoying the benefits of bulk buying) it will be a great service to us.						
11	I am aware of the various types of A.I. products.						
12	I always insist on periodical checkup of my livestock.						
13	I take abundant hygienic precautions while milking the animal as well as while supplying the milk to the society.						
14	Our society promptly pays the sale proceeds of the milk supplied						

Sr. No	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
		1	**2**	**3**	**4**	**5**	**6**
1	To increase the milk production, apart from adding the cattle, there are number of aspects which can increase the milk production.						
2	I have earmarked a part of my agricultural land for cultivation of green fodder.						
3	I am aware of the advantages of ensuring cleanliness of the cattle shed.						
4	During the summer I ensure that the cattle shed climate is maintained cool by using various methods.						
5	I am aware that there are number of varieties of semen and I insist on a particular semen irrespective of cost to ensure improvement in milk quantity.						
6	Dairy is an activity in our family for last few generations and therefore, I am aware of the precautions of the health/management of the livestock.						
7	I am aware of the precautions to be taken while conducting A.I. operation.						
8	I know the care to be taken of the pregnant cattle.						
9	I strictly observe cleanliness in all the dairy activities such as while milking the cow, supplying the milk to the society etc.						
10	I am ensuring that all my cattle are given vaccination at periodical interval and I stand to benefit from it.						

ANNEXURE - II

Questionnaire for the Village Dairy Milk Coop. Society

1. Name of the village: _____ Taluka _____

2. Name of the dairy society _____
3. Since when it is in operation:
   What is the audit class awarded to the society in 2016: A B C
4. What is the daily milk collection?

Sr. No.	Type of cattle	Period	
		During peak period (L/P/D)	During lean period(LPD)
1	Cows		
2	Buffaloes		

5. Where the milk is sent for processing: _____, what is its distance from the society? _____ kms.

6. Has the dairy society made any efforts to increase the milk supply?
   Yes ☐ No ☐

7. If the answer is yes, please specify:
   1) _____

   2) _____

   3) _____

8. Do you provide cattle feed/routine medicines to the supplier member? Yes ☐

   No ☐ If not? Any specific reason? _____

   _____

9. Does the society help the members to put up their insurance claims with insurance company? Yes ☐ No ☐
   If not, any specific reason? _____

10. Was there any occasion for rejection of the milk supply during the past six months? Yes ☐ No ☐
    If yes, any specific reason: _____

11. What is the periodicity at which the sale proceeds of milk are given to the members? Weekly ☐ Fortnightly ☐ Monthly ☐

12. What is the mode of payment?
    In cash ☐ Credit to bank account ☐

13. Do you deduct proportionate bank loan installment from the proceeds?
Yes ☐ No ☐
If not, why not? _____

14. In the following table a few statements are made. You have to choose one option from the five given options by putting ✓ mark at the appropriate place.

Sr. No	Statement	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**	**Total**
		1	**2**	**3**	**4**	**5**	
1	Our society organizes training programs for the milk supplier members.						
2	We assist the financing banks for recovery of their loan installment from the sale proceeds of the milk.						
3	There is a fair competition amongst members of the society to increase the milk supply.						
4	We have competition amongst the various societies operating in the Taluka.						
5	According to our information the insurance claims of the members are promptly paid.						
6	Banks in the area are promptly entertaining the dairy loan proposals from the members						
7	We provide our members information about the Govt. Schemes relating to dairy activity so that they can take the benefit of those schemes.						
8	Our suggestions for any improvement in the functioning of the society are taken well care of by the banks as well as our district dairy union.						
9	Our society is willing to make provision for cattle feed and usually required medicines as a supplementary activity so that it will be a help to the members as well as the society can make reasonable profit through bulk buying.						
10	We get required support from the district dairy union for improving working of the society and improving the milk supply						

ANNEXURE III – A

Training module for the Orientation programme

Target group: **Dairy farmers having minimum three years dairy farming experience**

Training duration: 1 working day

Training timing: 10 a.m. to 1. Pm. 2.p.m. to 5.0 p.m.

Training Objective:

- To upgrade the skills achieved by the dairy farmers.
- To educate the dairy farmers on the new techniques of dariy farming.
- To introduce the dairy farmers about the various insurance covers available to protect their interest.

Training tools used:

1) Entry point test of 15 minutes
2) Discussion sessions
3) Interaction with the panel of experts in the field of: animal hushandari, banking, insurance, primary coop. milk society.
4) Screening of films
5) Exit point test

Day 1:

1) **Inauguration:** Objective of the training program / participative interaction/ while leaving the program one should not have any douts about the portion covered.
2) **Risk management in dairy farming:**
   a) Selection of the animal
   b) Health care and breeding
   c) Need for use of high quality semen
   d) Housing arrangement for live stock
   e) Health care and raring of the livestock
   f) Milking the cattle
   g) Storage and transport,
   h) Care of the calf
   i) Insurance of the cattle as well as the infrastructure

3) Panel discussion (interactive)
4) Screening of the film
5) Exit point test
6) Conclusion – particpant's representative feedback.

ANNEXURE III – B

Training module for the Orientation programme

Target group: **Secretaries of the Primary Coop. Milk Society**

Training duration: 2 working days

Training timing: 10 a.m. to 1. P.m. 2.p.m. to 5.0 p.m.

Training Objective:

- Understand the role & responsibilities of DCS Secretary in perspective of increasing milk procurement & development of societies
- Understand & describe proper breeding, feeding, nutrition, health care & management of animals to enhance milk production.
- Understand & adapt clean milk practices
- Descript the present scenario & developments in cooperative dairying & appreciate the need for cooperative to be competitive.

Training tools used:

a) Entry point test of 15 minutes
b) Discussion sessions
c) Interaction with the panel of experts in the field of: animal husbandry, banking, insurance, primary coop. milk society.
d) Screening of films
e) Exit point test

Day 1:

1) **Inauguration:** Objective of the training program / participative interaction/ while leaving the program one should not have any douts about the portion covered.

2) **Risk Management for Secretary** :
   a) Quality assurance at DCS
   b) Communication in field work
   c) Importance of Cooperative& its rules & regulations.
   d) Health Care & Management of Dairy Animals
   e) Ration Balancing of Dairy animals
   f) Vaccination, Deworming Schedule.
   g) Awareness about FDA Rules & Regulations.
   h) Input Facilities for Dairy animals.
   i) Clean Milk Production.
   j) Problems associated with quality of milk
   k) Importance of values in collective action
   l) Importance of breeding & Different types of Semen

m) Preventive measures in occurrence of Outbreak of diseases in animals.
n) Understanding key operational costs & its implication on producer milk price
o) Role of women in dairy cooperatives & ways to promote their participation
p) Maintaining daily cash books, Handling & Maintenance of dairy equipment
q) Accounts & preparation of audit, Changes in Cooperative laws
r) Adulteration test of milk
s) Importance of Insurance for Dairy animals.
t) Use of Ethno Veterinary Medicines in animals
u) Knowledge of different Govt. Schemes

3) Panel discussion (interactive)
4) Screening of the film
5) Exit point test
6) Conclusion – participant's representative feedback.

ANNEXURE III – C

Training module for the Orientation programme

Target group: **Members of the Managing Committee of the Primary Coop. Milk Society**

Training duration: 2 working days

Training timing: 10 a.m. to 1. p.m. 2.p.m. to 5.0 p.m.

Training Objective:

- To make aware on financial and accounting Management in DCS
- To make them aware Management of DCS
- To make participant understand on how to prepare business plan.
- To impart knowledge on roles and responsibilities of MCMs
- To give awareness on cooperatives By-laws

Training tools used:

a) Discussion sessions
b) Interaction with the panel of experts in the field of: animal husbandry, banking, insurance, primary coop. milk society.
c) Screening of films
d) Exit point test

Day 1:

1) **Inauguration:** Objective of the training program / participative interaction/ while leaving the program one should not have any douts about the portion covered.

2) **Risk Management in Primary Coop. Milk Society :**

a) Preparation of business plan
b) Importance of Cooperative & its rules & responsibilities
c) Financial and accounting Management of DCS
d) Process of decision making
e) Different Govt. Schemes for Producers.
f) Balance Sheet of Society
g) Audit Preparations & Changes in Cooperative laws
h) Insurance for building & infrastructure
i) Records of Society
j) Regular recovery of payment for banks & insurance from producers.
k) Collection of Clean Milk.

l) Awareness about FDA Rules & Regulations
m) Supplying good Input Services for Dairy Animals.
n) Scheduling of Different types of training for producers.
o) Animal Health Management & Ration Balancing of Feed.
p) Use of Ethno Veterinary Medicines in animals
q) Proper Fund Utilization for different schemes for producers.
r) Purchase of Common Technical Inputs like Chaff Cutter, Fodder Bank, Milking Machine.
s) Use of Ethno Veterinary Medicines in animals
t) Impact of Dairy Business on Environment.

3) Panel discussion (interactive)
4) Screening of the film
5) Conclusion – participant's representative feedback.

URKUND

Urkund Analysis Result

Analysed Document:	Thesis for Pre Submission.docx (D42863489)
Submitted:	10/22/2018 9:20:00 AM
Submitted By:	shashankpol311257@gmail.com
Significance:	1 %

Sources included in the report:

Medhavini S Katti Economics.doc (D21413730)
Report New.docx (D40289028)
Economics of Animal Husbandry in Kolhapur District.pdf (D39486979)
Jagan Thesis.docx (D24541212)
https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Dairy%20and%20Products%20Annual_New%20Delhi_India_10-11-2013.pdf
https://en.wikipedia.org/wiki/Livestock
https://en.wikipedia.org/wiki/Rural_economics
https://www.ifama.org/resources/Documents/v19ib/2Vitaliano.pdf

Instances where selected sources appear:

14

Mr. Vivek. H. Ksheersagar
Research Student

Dr. Shashank. K. Pole
Research Guide

Dr. Shaila Bootwala
Principal & Chairman - DAIP
DIRECTOR
Abeda Inamdar Senior College
Research Centre in Commerce

Pune
31.10.2018

ABEDA INAMDAR SENIOR COLLEGE CAMP PUNE-1