

**A MINOR RESEARCH PROJECT FINAL REPORT**

**“SPATIAL PATTERN OF MILK PRODUCTION  
AND CO-OPERATIVE DAIRY FARMING IN  
SANGLI DISTRICT”**

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## Acknowledgement

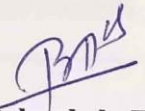
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## **CHAPTER I**

### **INTRODUCTION**

#### **1.1 INTRODUCTION:**

India is a developing country where agriculture is the main occupation of the majority of population however, agriculture in India tends to be a gamble with the undependable monsoon. Despite nine five year plans Indian farmer is still not freed from the clutches of monsoon. The Indian farmer is compelled to depend on the most irregular and uncertain and consequently undependable monsoon for decades to come. The present India's stock of food grains will not help in providing food for all people in the country; the marginal farmers landless labors and the people poverty line have no money to buy relatively expensive food grain In India 19.3% population living under poverty line [census 2001] and total population is 102.7 crores [census 2001] or lakh of irrigation out of them 60% are composed of less than two hectares of land size. These small holders are mainly used for subsistence farming lack of sufficient fertilizer facilities. The most of the small farmers can hardly produce one crop a year the result of yield is very low.

In India 30% farmer are small holders and nearly 25% of the rural house holders are land less live stock is a sub sector of Indian agriculture. The contribution of this sub sector to the agriculture is nearly 24% and dairy farming is again sub sector of livestock sector. The small and marginal farmers and land less labors is an owner of one or two milch animals. The traditional concept of dairy farming in India is totally different from the modern concept of dairy farming in western countries. In India dairy farming is a business mainly of small and marginal farmers. At present India's dairy farming industry is growing at a fast rate and need a special and temporal analysis.

Agriculture is the backbone of the Indian economy. Agriculture is the source of livelihood for over 70 per cent of population. According to the Indian census 2001, 69 per cent of Indian population is engaged in agriculture. The agriculture is known as gamble in the monsoon due to inadequate and irregular rainfall. The landless laborers who depend on the seasonal work for living have no money to buy relatively expensive grains. Many millions of small farmers cannot even produce enough on their meager plots of land to provide food for their family.

Indian agriculture is characterized by the ownerships of small land holdings. The small holdings are devoted to the subsistence food crops production and the small farmers inadequately fertilized and without irrigation can produce only one crop a year, which in turn keeps the farmers poor and provides no money to buy the fertilizers and better seeds needed to produce better crops. For half of the population of the nation life is a daily struggle, to find enough food to keep the family alive. For 300 million people in India poverty is a way of life.

Modern agriculture is highly technical and capital oriented. In India, where 80 per cent of the farmers are small holders, agriculture should be supplemented with the subsidiary occupation such as dairying, poultry, sheep rearing, cattle breeding etc. There are enough evidences to show that the 'Green Revolution' has benefitted the big land holders who have the irrigation facilities and enough financial resources for the purchase of technical inputs which are the essential ingredients of new technology responsible for the Green Revolution. The recent research studies revealed the fact that dairying can help the country to achieve what had not been possible to do through the spread of the Green Revolution for the small and marginal holders and the land-less laborers. Unlike the cultivation crops, progressive dairying not only places the medium and big farmers into more advantageous position but also increases the income of the small farmers and land-less laborers to a remarkable extent.

## **1.2 IMPORTANCE OF MILK IN HUMAN DIET:-**

Milk is one of the Nature's most nearly perfect foods. It contains almost all the material that the human body needs and in the most suitable percentages. Cow's milk contains on average 87 per cent water and 13 per cent solids consisting of proteins, fats, sugars, a variety of mineral substances and vitamins. All these substances are in such form that they can be easily utilized in building and repairing the body tissues and bones and maintaining health and normal growth.

The Nutritional Expert group of the Indian Council of Medical Research has recommended 300 grams of milk for preschool children in the age group of 7-12 years and boys and girls in the group of 13-18 years and 200 grams for adult men and women and an additional 125 grams for lactating mothers per day in the case of vegetarians. For meat eating people the recommended requirement ranges from 200 grams for children and 160 grams for adults. While milk is a good food for man it is also an ideal medium for the growth of bacteria. Care should be taken to prevent

bacteria from outside entering into it. Even milk that looks clean may contain germs of such throat if drawn from diseased animals if handled by persons carrying the germs of these diseases is washed in polluted water.

### 1.3 COMPOSITION OF MILK:-

#### Milk (definition):-

The milk may be defined as the whole, fresh, clean, lacteal secretion obtained by the complete milking of one or more healthy milch animals excluding that obtained within fifteen days before, or five days after calving or such period as may be necessary to render the milk particularly colostrums free containing the minimum prescribed percentage of milk fat, and milk solids not fat (SNF). In India the term 'milk' when unqualified refers to cow or buffalo milk or a combination of two.

Chemically, milk is a complex mixture of fats, proteins, minerals, vitamins and other miscellaneous constituents dispersed in water. Milk, when freshly obtained is a white opaque fluid when seen in bulk, and has a characteristic faintly-sweetish taste and peculiar odor. The white colour of milk is due to the calcium caseinate it contains, and the opacity is due to the same substance and to fat. Sometimes, a more or less yellowish tinge is noticeable, that it is due to lactochrome associated with the fat of milk. The specific density of milk ranges between 1.027 to 1.040, the average being 1.032. Cold milk has greater viscosity and cohesion than warm milk. Viscosity is increased by age, low temperature, products of fermentation and a high solid and fat content. The freezing point of milk is 0.54 to 0.57°C lower than that of water and is generally given as nearly 31°F. When water is added to milk the freezing point rises. Boiled milk has a lower freezing point than raw milk.

**Table No – 1.1**  
**Composition of Milk**

<b>Sr. No.</b>	<b>Constitutes</b>	<b>Per cent</b>
1	Water	86.60
2	Casein	4.40
3	Fat	3.25
4	Milk sugar	4.55
5	Albumin	0.45
6	Ash	0.75
<b>Total</b>		<b>100</b>

*Source: - Milk and milk products by Industrialist.*



#### **1.4 IMPORTANCE OF DAIRYING:-**

In the subsidiary occupation for agriculture, dairy is leading activity and plays a vital role in the rural economy. Dairy helps to tackle the serious problem of unemployment. Dairy development is being used as a poverty eradication measures i.e. providing supplementary employment under Integrated Rural Development Programme (I.R.D.P.).

Indian farming is becoming uneconomic due to the heavy pressure of population. Therefore, they cannot get adequate income. Hence, they could not solve their economic problems. Dairy activity brings about significant change in socio – economic structure of rural economy. Dairying provides employment to the rural landless, small and marginal farmers with supplementary employment and regular source of income and ultimately helps them to increase the standard of living.

#### **1.5 CO-OPERATIVE DAIRYING IN INDIA:-**

Indian co-operative movement has not been outcome of a popular demand from the people, it was and still it is an act of the Government, to ameliorate the condition of the economically weaker sections, so that in each state in India, there is a regular Department of co-operation under a minister.

The co-operative societies act was passed in 1912 and the first co-operative dairy was established at Allahabad in 1913.

Co-operative movement is recognized as the most powerful tool for overall socio-economic development of the rural community. As such, milk co-operatives have been in the focus in attracting small and marginal farmers. The Green Revolution, the Government of India has also adopted 'White Revolution' through the National Dairy Development Board. Presently, dairy has been properly organized on co-operative basis in Maharashtra and other states of India.

#### **1.7 DAIRY FARMING IN MAHARASHTRA:-**

The co-operative movement in Maharashtra was geared by Dr.Dhananjayrao Gadgil and Mr. Vikhe Patil by establishing a sugar co-operative factory. Slowly co-operative movement diffused in the dairying. The main intention of co-operative dairy in Maharashtra was provided and attractive, alternative means of development to vast

majority of farmers including large and small farmers as well as the landless. The milk co-operative society in Maharashtra was 450 in 1960-61 which increased to 610 in 1978-79 and in 1990 increased 31294 dairying the same year 36 co-operative milk project in the state. In to 2009 total 1012 chilling centers was started .The project of milk operation fluid was carried out in 1971 and second phase in 1978 now 85 % of total milk supply is made through co-operative sector in Maharashtra. The milk production in 1975 was 4 lakh liters. While 50 lakh liters in 1980 were in Maharashtra. The milk production approximately 154 lakh liters in 2003. The milk was imported in Maharashtra until 1983 but now it is exported to other state.

### **1.8 CHOICE OF THE REGION:-**

It has been already discussed that the dairy activity plays an important role in the economy of the country. In the present thesis, attempt was made to trace the spatio-temporal variation in dairy development of Sangli district. The reasons for selecting the particular Sangli district are summarized as below.

1. The Sangli district is largely drought prone areas and has insignificant irrigation facilities except Walwa, Miraj, Shirala and Palus tahsils. There is always shortage of drinking water.
2. The Sangli district has a fertile land.
3. Dairy activity is regarded as an integral part of the agriculture in the region.
4. Development of agro-based industry like sugar industry in the co-operative sector has helped the dairy activity to a greater extent, through availability of capital for progressive investment.
5. There is very limited scope for further increase in the land under cash crops as the eastern and northern part of the region is drought-prone area.
6. Agriculture in the Sangli district depends on monsoon. In such a condition, agriculture is not well develops in this region. So dairy activity is more developed to agriculture sector in subsidiary occupation.

Dairy development of this region has not been studied yet by the geographers.

## CHATER – II

### REVIEW OF LITERATURE

**Madhuri Oruganti**, (2011) work in “Organic Dairy Farming – A New Trend in Dairy Sector”. And concluded that the Organic Dairy farming means raising animals on organic feed (i.e. pastures cultivated without the use of fertilizers or pesticides), have access to pasture or outside, along with the restricted usage of antibiotics and hormones. Products obtained from Organic dairy farm are the organic dairy products. Organic farming is a system of production, a set of goal-based regulations that allow farmers to manage their own particular situations individually, while maintaining organic integrity. In this article, the benefits, conditions required, constraints involved, and manage mental practices of organic dairying, along with information about the regulatory authorities concerned with the organic dairy farming were reviewed briefly to make students and farmers aware of organic dairy farming.

**Shivakumar K. Radder and S.K. Bhanj**, (2011) they work on “Perceptions of Dairy Farmers of Gadag district in northwestern part of Karnataka state, India regarding Clean Milk Production”.

Clean milk production is one important aspect in enhancing the quality of milk. It is important to know farmers' perception about it. With this view, present study was undertaken with the objective of understanding perception of dairy farmers about clean milk production. The study was conducted in six villages of Gadag district of Karnataka state. A total of 180 respondents were interviewed. Perceptions of the farmers regarding family manpower involved in dairy farming, personnel involved in milking, dairy income, intention to produce clean milk, price dependence for following clean milk production, reasons for following cleanliness measures in milk production, sale price received for milk and satisfaction for the price they received for milk were studied. Most of the dairy farmers expressed their willingness to follow clean milk production measures. Further, most of them were ready to follow such measures even if they were not paid more prices for milk. Farmers practiced clean milk production measures mainly to follow regulations at the dairy co-operative society followed by to avoid spoilage of milk. Dairy farmers largely neglected impact of cleanliness on animals' udder and health, about milk contamination causing health hazards. Milking was mainly a domain of women. For over 80 % farmers, dairy farming provided a moderate income as portion of their total family income. Majority of the producers were not satisfied with price they were getting for milk. Hence, the study recommends, requisite facilities and guidelines from the agencies concerned are needed to be provided to the dairy farmers to adopt clean milk production practices. Proper education to the farmers regarding importance of clean milk production from health, marketing and animal health point of views needs to be given. There is need to give more importance to women in dairy farmers' trainings. The study also suggests

offering satisfactory price for milk to hasten the process of adoption of clean milk production practices by the dairy farmers.

Dairy farmers largely neglected impact of cleanliness on animals' udder and health. They also did not seem to know about milk contamination causing health hazards. However, majority of them inclined to follow clean milk production measures. Requisite facilities and guidelines from the agencies concerned are needed to be provided to the dairy farmers to adopt clean milk production practices. Hence, the study suggests for proper education to the farmers regarding importance of clean milk production from health, marketing and animal health point of views. Milking was mainly a domain of women. The study suggests giving more importance to women in dairy farmer's trainings. Majority of the producers were not satisfied with price they were getting for milk. The study also suggests offering satisfactory price for milk to hasten the process of adoption of clean milk production practices by dairy farmers.

**Kolekar D. V. and Meena H. R.** (2012) Studied on "Analysis of the Motivating Factors Perceived by the Farmers and Contract Dairy".

The present study was conducted purposively in Satara district of Maharashtra to ascertain the motivating factors perceived by farmers and contractor under contract dairy farming. The district was having the highest number of contract dairy farmers being engaged with the Govind Dudh Phaltan constituted the population for study. An interview schedule was developed by incorporating variables required for the study. The data after collection, compiled, tabulated and analyzed by using the appropriate statistical method. The study revealed that medium to high access to inputs, credit, marketing facility, production reliability and shared risk, guaranteed and fixed pricing structure and skill transfer among the contract farmers were the major dimensions contributed towards adoption of improved dairying practices under contract dairy farming. The contract dairy farmers were having access to various services such as milk cooler, clean milk campaign, community milking parlor, feed production, feed provision through contract, feed processing by raw materials, mineral mixture production, health facilities, vaccination, deworming, annual animal management service, animal breeding improvement program etc. under contract farming. Also they had access to various technologies such as loose housing system, silage making, urea treatment, farm technologies, seeds of improved fodder etc. under contract farming.

**Azam MA, Khan MKI and Das A.** (2012) they work on "Adaptability and Survivability of Different Crossbreds cattle under Commercial Dairy Farming Conditions in Chittagong area".

The present study was undertaken to investigate the adaptability and survivability of different crossbred dairy cows under commercial farming conditions in Chittagong, Bangladesh. Different cattle genotypes (Holstein  $\times$  Local, Sahiwal  $\times$  Local, Sahiwal  $\times$  Holstein and Jersey  $\times$  Local) were found in the studied farms. The

percentages of Holstein  $\times$  Local was (58.94%) higher than other genotype. The survivability of Holstein  $\times$  Local, Sahiwal  $\times$  Local, Sahiwal  $\times$  Holstein and Jersey  $\times$  Local calves were  $84.0 \pm 3.90$ , 100,  $97.1 \pm 5.48$  and 100 percent, respectively. The survivability of calves and cows were significantly different ( $P < 0.05$ ) among genotype. Survivability of bull-calves and heifers were similar for all the genotypes.

From the present study, it was found that farmers in Chittagong area reared cows with Holstein genetics in higher proportion than other genotypes. Holstein genetics remain longer period within the herd than other. The survivability of Sahiwal  $\times$  Local and Jersey  $\times$  Local crossbred calves were found to be higher. In spite of the lower survivability of Friesian  $\times$  Local crossbred calves farmers of Chittagong region kept this crossbred more in number due to higher milk production and availability of replacement heifers than local and other genotypes. From this study, it can be recommended that Holstein  $\times$  Local crossbred could be good option for future selection of cattle rearing in Bangladesh perspective. The main limitations of the study were small number of records per genotype that affected the results of the study. Therefore, further studies with higher sample size are recommended.



## **CHAPTER: III**

### **GEOGRAPHICAL SETTING OF STUDY REGION**

#### **3.1 INTRODUCTION:**

The Sangli district is situated in the Southern part of Maharashtra and is a part of Deccan plateau. It is endowed with the gift of fertile black soils in the central parts. The rainfall decreases from west to east. The eastern part of Sangli district has a scanty drought prone belt of the state. Thus there are regional disparities.

The central part of Sangli district is cultivable area. The eastern part include Jat, Kavathe Mahankal tehsils is drought prone area and has insignificant irrigation facilities. The northern part of Sangli district also rain shadow area. There is always acute shortage of drinking water.

The Sangli district consists of Ten tehsils, namely district Walwa, Shirala, Atpadi, Khanapur, Tasgaon, Miraj, Jat, Kavathe Mahankal, Kadegaon and Palus.

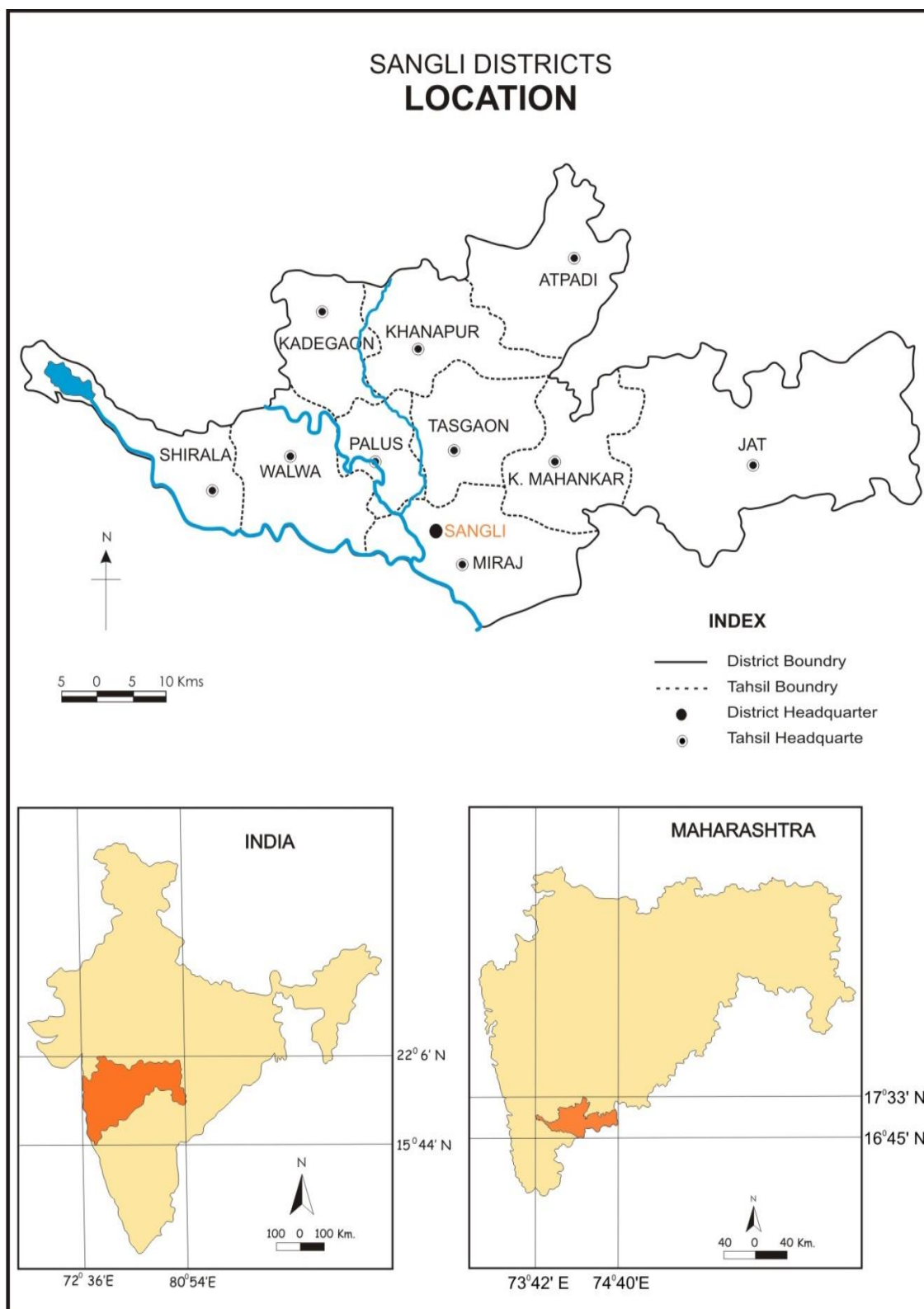
Topographically the region has large diversified surface. Climatically the region falls under the rain shadow region of Sahyadri Mountain. Temperature increases from west to east and rainfall decreases from west to east. Climatically, the region shows four seasons, namely monsoon, post-monsoon, cold season and hot season. The region is drained by Krishna and its tributaries as Yerala and Agrani.

#### **3.2 SANGLI DISTRICT: LOCATION AND GEOLOGY**

##### **3.2.1 LOCATION:-**

The Sangli District is one of the most district of Maharashtra state. It is situated between the latitudes 16°45' N and 17°33' N and longitudinal of 73°41' East and 75°41' East.

The district is bounded by Satara district on the North western side. Southern is boarded by Belgam and Bijapur district of Karnataka State. At the Centers and East Kolhapur district and the Ratnagiri district lies on West of Sangli district. The total area of the district According to 1991 censuses about 8601.5 Sq.km. According to 2001 censuses the population is 2581835 Lakh and the literacy rate is about 76.6%.



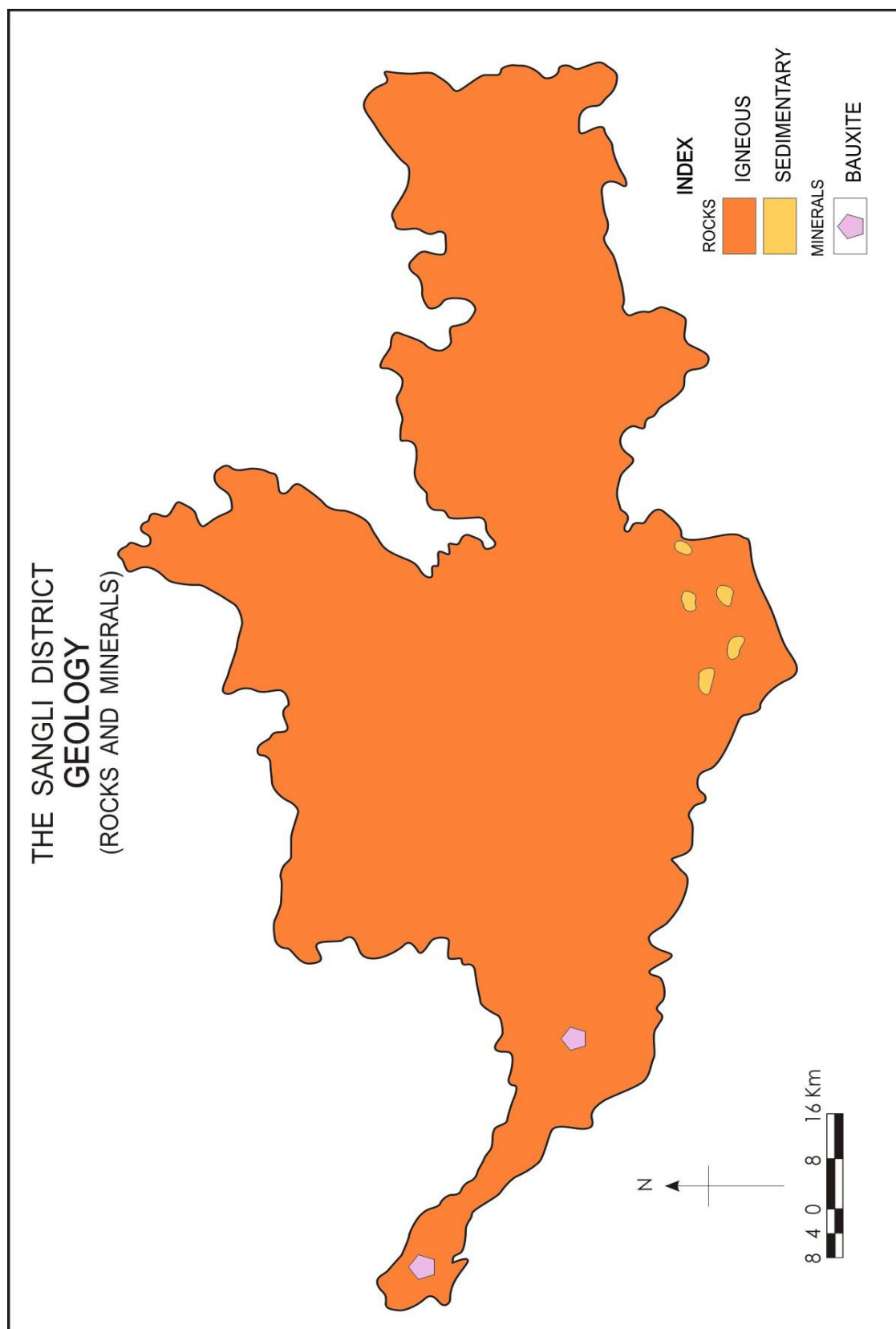
**Figure No. 2.1**

### **3.2.2 GEOLOGY:-**

The Sangli district is a part of Deccan plateau. Basaltic is main rock in the Sangli district. The geological formation of Sangli district is only the Deccan trap. The Deccan lava flows are found usually in the form of horizontally bedded sheets. They are more or less uniform in composition corresponding to basalt. These are dark gray or greenish gray in color.

Some parts of the Sangli district particularly the river valley are occupied by the typical black soil. These soils are formed from the Deccan trap. The black soil contains high alumina and carbonates of calcium and magnesium with variable amount of potash, low nitrogen and phosphorous.

The deposits of calcium carbonate are found in the form of 'kankar' in the eastern part of Miraj taluka. The hill in the region contains hard basalt rock, which is found in beds of river Yerala. The river beds are main source of sand for construction.



**Figure No. 2.2**

### **3.3.1 RELIEF:**

The region is a part of Deccan plateau. The topography of the Sangli district becomes uneven. The general slope of the land is from north to south and south-east. There is Mahadev range and its offshoots. The relief divisions of the region are as below.

- a. Central area.
- b. South-eastern area.

#### **A. Central area:**

It includes Khanapur tahsil. This region comprises the part of Khanapur plateau of Deccan tableland. In this, the western hilly area includes Dongarai-Tadasar ranges and Apsinge-Nerli ranges continue to the western part of Khanapur tahsil and Kadegaon tahsil. They run in west-east direction.

The eastern hilly ranges are spread in northwest to southeast direction. They are named as Solkai Dongar, Renavi Dongar, Dargoba shukracharya Dongar etc. The plateau region comprises mainly western part of Khanapur tahsil.



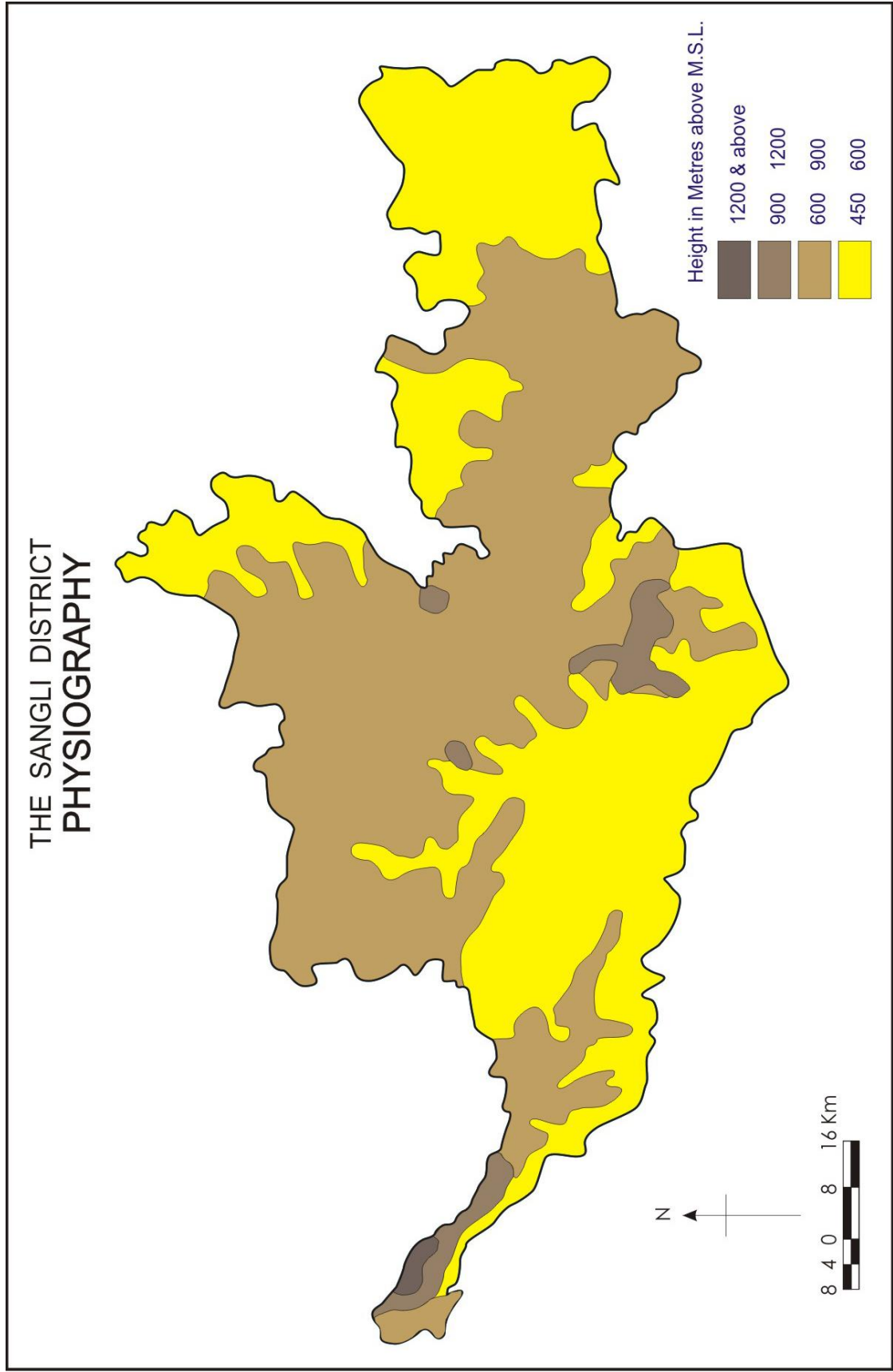


Figure No. 3.3

**B. South-eastern area:**

The Dandoba range is comprises in the north of Miraj tahsil. The Dandoba range is water divider of Agrani and Krishna River. The general nature of the range is featured by the occurrences of alternate spurs and small valleys. The altitude foot hill ranges from 600 to 900m presenting undulated topography.

In the eastern part of this area includes Kavathe Mahankal tahsil and some part of the Jat tahsil. There are local hills spread over these areas towards east-west and south to east - west. The land on the hills is more or less heightened; normally these hills are covered with jungle grass.

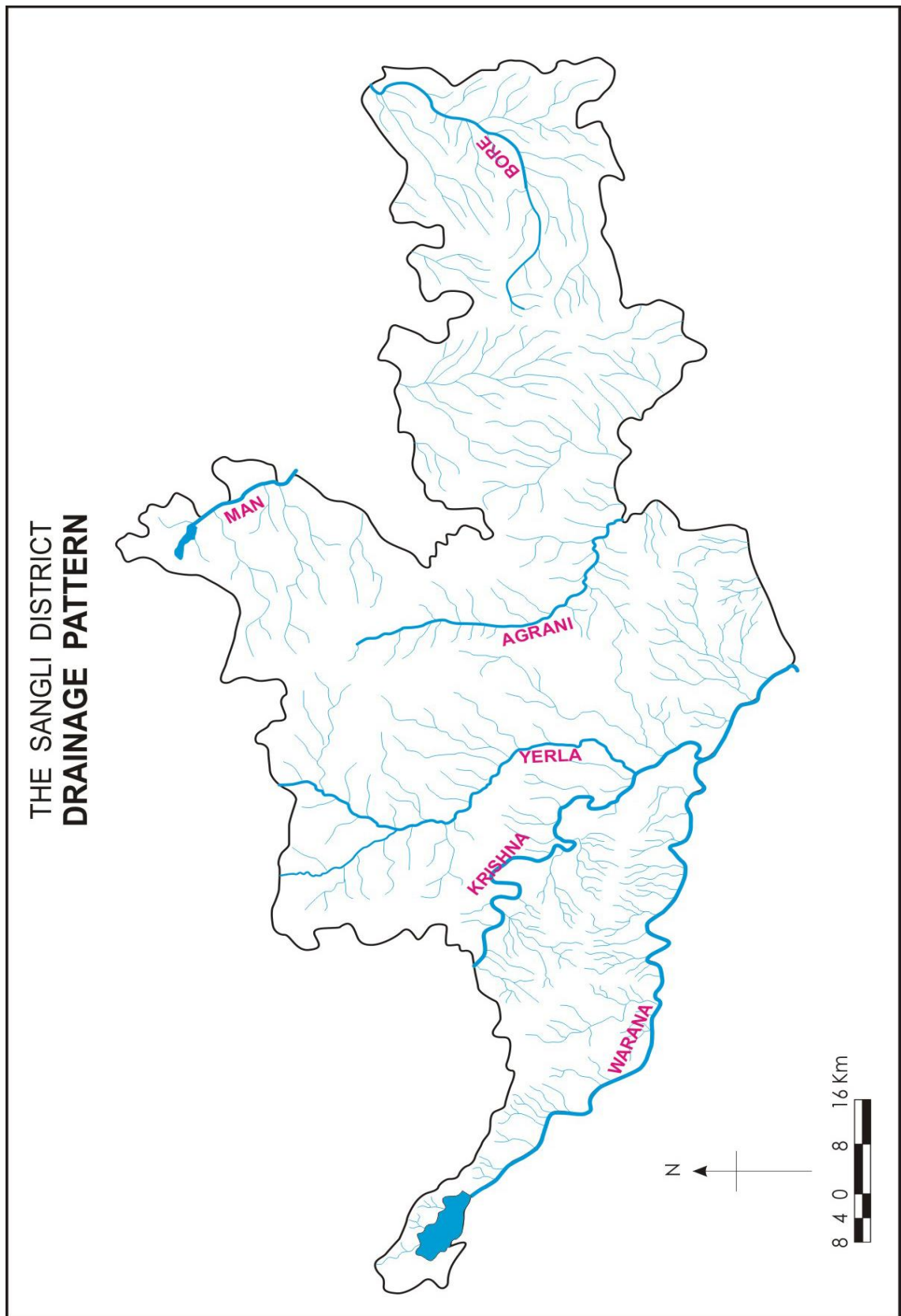
**2.3.2. DRAINAGE:**

Water resources emerge from nature's gift of rain, wells, rivers, lakes and streams. Irrigation water i.e. dams, canals are important and assured source for agriculture. Availability potable drinking water is also equally important today.

In the Sangli district, the river Krishna, Yerala and Warana and its tributaries make the region fertile. River Krishna flows to south- western border of the region and also makes the region fertile.

**A. Yerala River:**

The Yerala, the largest river of the left bank of the northern feeders of the Krishna rises in Solkanath hills in the extreme north of Khatav. It flows north to south in a valley flanked by the Vardhangad - Machhindragad range on the right or west and by the Mahimangad – Panhala range on the left or east.



**Figure No. 3.4**

It flows 90 kms in Tasgaon and Miraj tahsil joins the Krishna near the Bramhnal. The east bank tributaries of the Yerala are generally longer though somewhat drier than those of the west.

The important west bank tributary of the Yerala is Nani River. It has parallel to the Vardhangad – Machhindragad range and is joined by several small tributaries which drain the eastern slopes of that range, the chief of which is Mahadev Odha. Half a mile below the junction of the latter, the Nani has been dammed at Chikhli and the Chikhli canal taking off from it on the western bank of the river affords some limited irrigation facilities between it and the river.

#### **a.1 Sonhira Odha:-**

The Sonhira Odha is another west bank tributary of the Yerala flowing eastwards on the northern side of the Kamal Bhairav mountain into the Yerala.

#### **b.2 Kapur Nala:-**

It is most important because it has a good subterranean flow of water under the sands even in the dry season. Oil pumps installed on wells on its banks tap this subterranean flow and regular crops of sugarcane, plantain and chilly are raised. At Tasgaon there are even coconut and chilly gardens on the banks of this stream.

#### **B. Agrani River:-**

The Agrani River is second most important river in the Sangli district. The origin of the river begins from the temple of AgasthiHrushi near village Ainwadi (Venapur) in Khanapur tahsil. After flowing about 32.18 km. in a southward direction, river turns towards the south – east. The river has narrow valley bottom.

There are number of small a tributaries which joins the river Agrani. One important tributary of the Agrani River rises on the plateau some 3.21 km. above Kundlapur and flows due southwards passing by Kuchi and Kavathe Mahankal before joining the Agrani.

### **C. Krishna River:-**

River Krishna is a main source of supply of water for drinking, industries and irrigation. It flows south – western border of the Sangli district especially Walwa and Miraj tahsil. Yerala joins the Krishna river by border the Sangli district but Agrani joins it just outside. The Krishna valley of the Sangli district is the most fertile.

### **D. Warana:-**

The Western Part of Sangli district is Bordard by Warana Rivar. The Warana River Origin in the Sahyandri range.

### **2.3.3. CLIMATE:**

Climatically, this region falls under the great monsoon and associated with the rain shadow region of the Sahyadri Mountain. The character of monsoon with four months of rainy season followed by eight months of relatively dry period of winter and summer. The annual climate cycle consists of the region has four season.

- A. South – west monsoon season–June to September.
- B. Post – monsoon season-October to mid December.
- C. Cold weather season–Mid December to February.
- D. Hot weather season–March to May.



## **CHAPTER: IV**

### **SOCIO-ECONOMIC STATUS OF THE SANGLI DISTRICT**

#### **4.1 INTRODUCTION:-**

In the preceding chapter the role of physical factors in agriculture and dairy activity has been analyzed. However, farming is not merely a product of physical setting but also of man-made frame. Physical setting of a region provides broad limits to agricultural activities within which farmer acts and cultivates with the consideration of several socio-economic factors which set their imprints on the population, irrigation, transportation, industries and banking facilities. These factors are analyzed based on the basis of available data and information abstracted from the agricultural and population census and government report.

#### **4.2 AGRICULTURE:-**

Agriculture has been the main source of livelihood of the people in the region. Irrigation policy for each region is almost similar except it differs due to volume and length of rivers, their numbers, sources other than rivers, viz. natural reservoirs, nallas, wells, etc. The policy is also decided on the basis of quality of land, cropping pattern, total geographical area, etc. With the help of irrigation facilities farmers increased their agricultural production and improved their own economic conditions. In the low rainfall region, irrigation is the most important factor. Canals, wells and lift irrigation are the main sources of irrigation in the region. In Sangli district, Zilla Parishad, State and Private co-operative societies play an important role in the working of irrigation schemes. There are some medium projects of irrigation in the region. Yeralwadi project (3140 hectares), Siddhewadi project (730 hectares), Basappawadi project (860 hectares), Ner project (4320 hectares), are some of the projects which irrigate 9050 hectares of land. In the region There are Krishna–Koyana project (Takari-Maisal), Tembhu project, Jihe–Kathapur project are the major projects out of the Sangli district which supplied water to the Sangli district. There are a large number of small, medium and large lift irrigation schemes which are supplying water to the region.

##### **4.2.1. CROPPING PATTERN:-**

Agriculture in the Sangli district is mostly of the intensive subsistence type with an emphasis on the production of food grains. Some commercial crops like cotton, sugarcane, oilseeds, vegetables and fruits etc. are also taken in the region.

*Kharif* and *Rabbi* are the two main crop growing seasons. The *Kharif* crops are sown with the onset of monsoon and harvested in September –October. The *Rabbi* crops are sown in October–November and harvested in February–March. There are some crops like *Jawar* and cotton which are grown in both the seasons. Sugarcane stands in the field for 12 to 14 months spread over both the seasons.

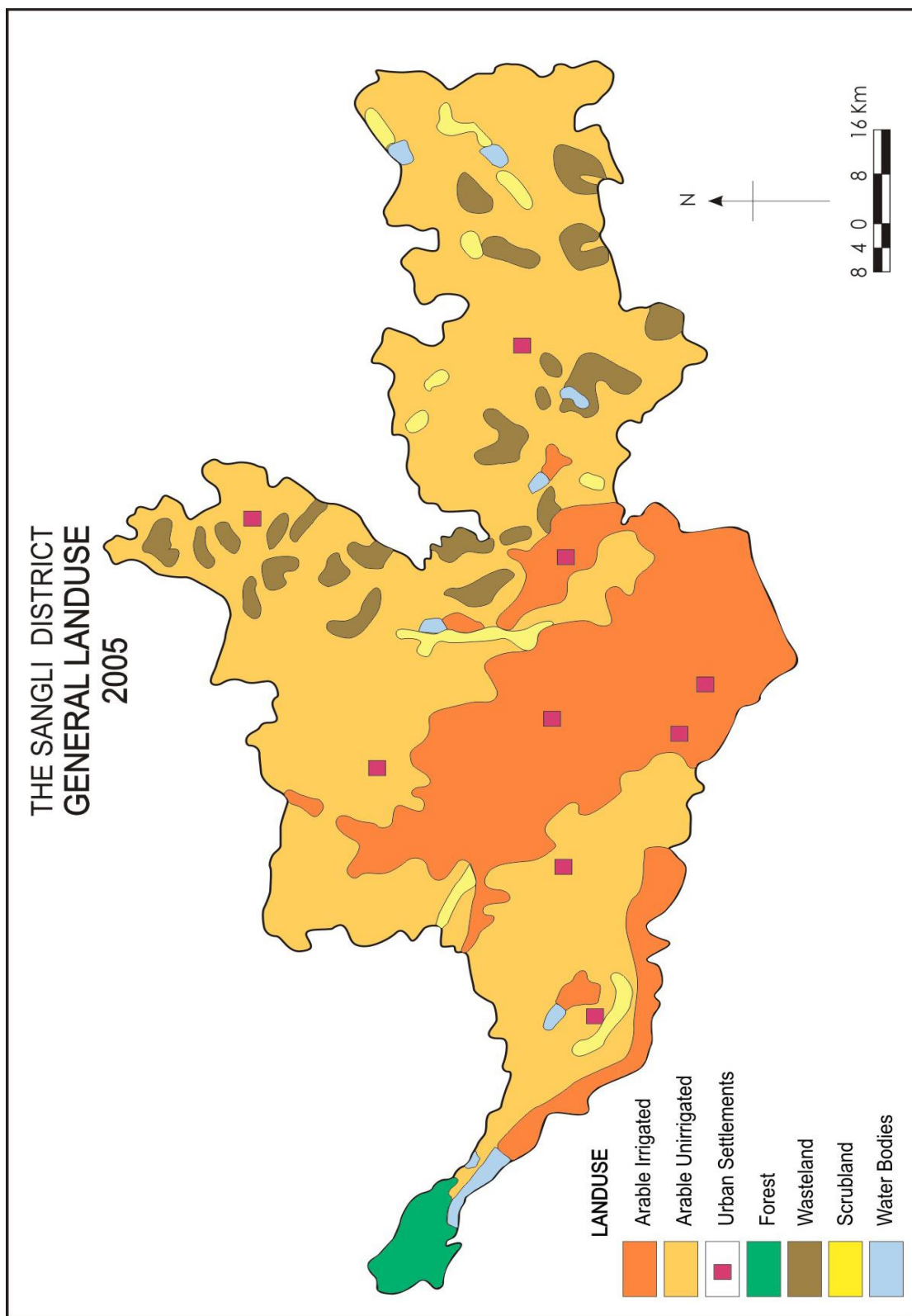
Table 3.4 reveals tahsil wise area under grain crops that 47.13% followed by *Jawar* (27.83%), *Bajara* (8.51%), and Sugarcane (4%) Soyabean (3.86%), wheat (2.38%), Gram (2.08%), Maize (2.01%), Groundnut (1.94%), and Rice (0.26%). It means agriculture in the region is mostly of the intensive subsistence type with an emphasis on the production of food grains.

**Table No – 4.1**

**Tahsilwise area under different crops in 2011 (Area in Hectares)**

Sr. No	Crops	Walwa	Kadegaon	Khanapur	Palus	Tasgaon	Miraj	KavatheMa hankal	Jat	Atpadi	Shiral	Total
1	Rice	4500	225	45	1670	55	82	0	0	5	11441	18023
2	Wheat	3818	400	2850	2290	1920	4800	975	3000	3021	1730	24804
3	Jowar	10861	15125	33850	6225	31450	19950	31000	87660	880	2585	239586
4	Bajara	20	846	8150	---	270	4250	5230	26750	1624	-	47140
5	Maize	11075	928	1205	830	2070	5750	1550	4174	824	2638	31044
6	Gram	5993	125	3060	2940	2630	4950	875	1200	1575	1410	24758
7	Total Grain crops	4803	23020	54265	15531	43535	41972	42228	124721	5033	4826	359934
8	Sugarcane	24400	7675	4900	7460	2301	13470	550	1086	535	6511	68888
9	Groundnut	10243	3633	4150	1470	4540	1135	725	1050	445	3780	31171
10	Soyabean	15358	3268	2530	8215	8500	10400	750	10	10	1352	50393
<b>Total</b>												<b>895741</b>

Source: - Agricultural Department of Sangli district and Satara district.



**Figure No. 3.5**

#### 4.2.2 IRRIGATION:-

Irrigation is the artificial application of water to overcome the deficiencies in rainfall for the growing of crops as well as availability of fodder. It is essential for the better yield and for assurance of the crops. Irrigation development in the region has to be viewed in the context of the climatic conditions especially rainfall, which is unevenly distributed and irregular. The region is semi-arid and not a large difference in the rainfall, therefore famines have occurred several times in the region. Agriculture is highly speculative venture under such harsh conditions which affect the agricultural production efficiency. Therefore, irrigation is vital for the success of agriculture in the region. Irrigation facilities are well developed in some parts of the region. At present the irrigation is practiced in the region and it is from wells, rivers, tanks etc. However, wells, canals (Government and private) and other sources including lift irrigation are the chief sources of irrigation.

**Table No – 4.2**

**Tahsil wise Area under Irrigation in 2011-12**

Sr.No.	Tahsil	Geographical Area in Hectares	Irrigated Area in Hectares 2011 – 2012	
		2011-12	Area	%
1	Walwa	80609	45650	42.7
2	Khanapur	68953	13665	15.20
3	Kadegaon	63469	5504	6.12
4	Tasgaon	66756	6742	7.50
5	Palus	6847	2565	8.85
6	Miraj	92624	33650	37.42
7	KavatheMahankal	51139	6678	7.43
8	Jat	41975	4450	4.95
9	Shiral	60700	2240	11
10	Atpadi	65960	4250	6.3
<b>Total</b>		<b>528400</b>	<b>142058</b>	<b>100</b>



**Table No –4.3****Financial Co-operative Santhas in Sangli District. Till 31<sup>st</sup> March 2009**

Sr No.	Name Financial Co-operative Santhas	Total
1.	Agricultural Credit Societies.	191
	1. District central Co-operative Bank.	01
	2. Primary Agricultural Co-operative Institutes.	748
2.	Non Agricultural Co-operative Credit Societies.	1523
	1. Rural Bank.	29
	2. Rural Co-operatives.	10303
	3. Workers Co-operatives.	191
3.	Treading Institutes -	55
	1. District Treading Institutes.	01
	2. Primary Treading Institutes-	14
	a.)Tahsil Treading or Special Treading Institutes.	40
4	Total Milk Co-operative Societies.	851
5	Total Irrigation Institutes.	274

#### **4.3 SOCIO – ECONOMIC CONDITION OF THE REGION:-**

The implementation of Operation Flood brought about a “White Revolution” in India with an increase in milk production. Today, India is the single largest milk producer in the world with annual production of 84.5 million tons during 2001–2002. The dairy farming has significantly contributed to the rural economy programmes on prime position as an instrument of socio–economic change. Dairy sector generates massive employment opportunities both directly and indirectly to millions of rural population with lowest investment. It is labour intensive and women oriented. It provides employment to more than 3/4<sup>th</sup> of the population. Along with regular farming activity, it gives a continuous employment, a steady source of income and therefore, dairying itself has been proved to be very effective tool in upgrading the economic status of the farmers in general and women in particular.

Here, an attempt to be main occupation of milk producers, size of family, economic condition, educational status, employment generation, infrastructural facilities etc are studied in the 46 sample villages in the Sangli district. Information regarding the milk producers has collected during the field work with the help of questionnaire and personal interviews.

## **CHAPTER – V**

### **SPATIO TEMPOERAL CHANG IN DAIRY FARMING**

#### **5.1 INTRODUCTION:-**

Need of milk and direct as well as indirect employment opportunity to the people. A large number of rural people are engaged in this subsidiary activity through which additional income is received by the farmers. The present stock of food grains in India will not help in providing food for all people. Most of the farmer's landless labor's and the people below poverty line have no money to buy relatively expensive food grain. In Sangli district 16.59% families are under poverty line. There are 14.37 lakh total live stocks (2007) in Sangli district, out of these 5.80 lakh milch animals. Total milk production in 2007-08 was 18.50 Cores Liters. Co-operative dairies plays vital role in the development of dairy farming in Sangli district.

Agriculture is a primary activity in India and animal husbandry is closely associated with it. Since origin of Agriculture, the domestication of animals has been a part of it. In the early stage the agriculture and animal husbandry were confined to the Center of origin of agriculture (Saver 1952). The domestication was made for milk purpose and later with the development of agriculture animals were also used for agriculture operation. Although milk has been obtained from cows, buffaloes, camels, sheep, goats and others. There is a major contribution of cows and buffaloes in milk production of the world. In India cows and buffaloes play an important role in milk production. In the western countries scientific development is made in dairy farming and it is considered as a business.

Live stock is a sub-sector of Indian agriculture. The contribution of this sub-sector to the agriculture is nearly 24% and dairy farming is again sub-sector of live-stock sector. The small and marginal farmers and landless labor's each own one or two milk animal. At present India's dairy farming industries is growing at a faster rate and need a special and temporal analysis. Present study is attempt that the spatial pattern of milch animals and milk production in Sangli district.

**Table – 5.1**  
**Distribution of Rainfall (2007-2008)**

<b>No.</b>	<b>Tahsil</b>	<b>Rainfall in mm</b>	<b>%</b>
1.	Shirala	1019	18.0
2.	Walva	692	12.1
3.	Palus	619	11.0
4.	Khanapur	543	9.5
5.	Atpadi	468	8.2
6.	Tasgaon	616	10.9
7.	Miraj	643	11.31
8.	KavatheMahankal	529	9.31
9.	Jat	553	9.7
10.	Kadegaon	653	11.3

Rainfall plays an important role in the development of dairy farming. The distribution of live stock and types of animals also depends upon rainfall distribution. The Following table shows the distribution of livestock in Sangli district.

### Distribution of Livestock in Sangli Districts (2007)

Sr. No.	Tahsil	Cow	Buffalo	Total (Cow+ Buffalo)	Ship	Goat	Poultry
1	Walwa	36559	107014	143673	28917	14625	327771
2	Khanapur	16142	41301	57443	29226	5160	193429
3	Kadegaon	20359	28924	49283	14720	5339	495836
4	Tasgaon	24230	68713	92943	33309	5698	117023
5	Palus	13088	42153	55241	16439	751	84572
6	Miraj	31695	85557	117252	42419	13304	580046
7	KavatheMahankal	27671	35929	63610	41143	173889	388730
8	Jat	78030	51500	129530	117911	77527	263190
9	Shirala	24259	52119	76378	9282	2070	123939
10	Atpadi	21913	21525	43438	55328	47839	166421
Total		294046	534745	828791	190112	398594	4481749

According to the total number of live stock population is high in Jat tahsil and in Walwa, Miraj, Kavathe Mahankal, Shirala and Atpadi tahsil live stock population is moderate and in Palus, Khanapur, Kadegaon tahsil there is low live stock population. As per climatic condition number of cows and buffaloes are more in high rainfall region and sheep's and Goats are more in Jat and Atpadi tahsil where rainfall is low.

The co-relationship between rainfall and total livestock has been analyzed by using Karl's Pearson correlation method, it shows a negative correlation. ( $r = - 0.26$ ); it indicates that there is a low livestock in high rainfall area and high livestock in low rainfall area. Shirala tahsil rainfall is high but total livestock population is low and in Atpadi and Jat tahsil rainfall is low but livestock is high.

In dairy farming cows and buffaloes are most important animals. More than 90% of milk is produced by cows and female buffaloes. For the study of the spatial pattern of milk production in Sangli district only milk animals are considered. The Following table shows the distribution of milch animals and total milk production in Sangli district.

## 5.2 DISTRIBUTION OF MILCH ANIMALS AND MILK PRODUCTION:

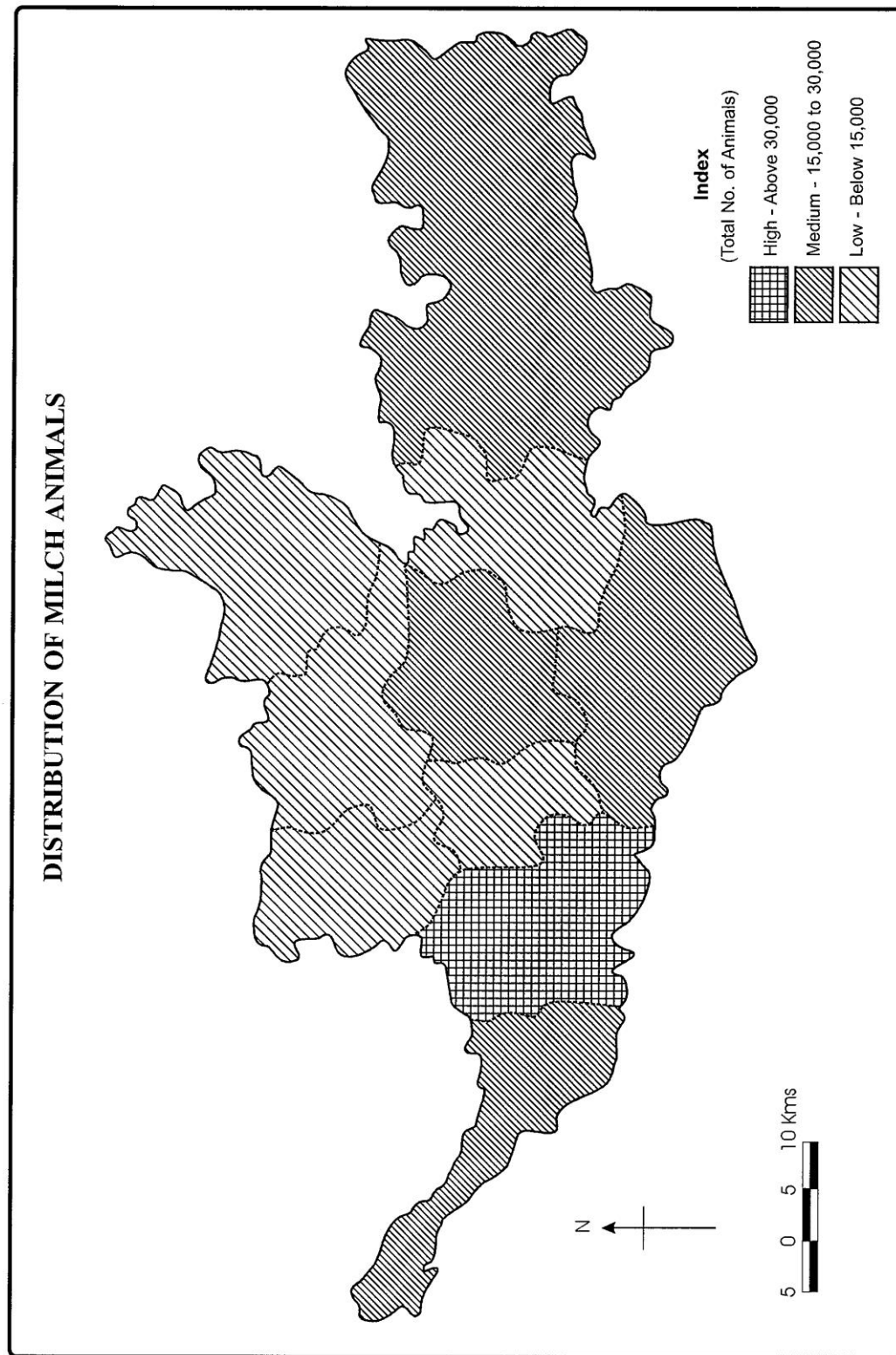
Indicates that the distribution of milch animal's and milk production in Sangli district. In Walwa there are more milch animal's and milk production, in Miraj, Tasgaon, Shirala and Jattahsil there are moderate and with animal's while in Khanapur, Atpadi and K. Mankhal there are low number of milk animal. It indicates that Walwatahsil is leading first in milch animals as well as in milk production, while K. Mahnkhal, Khanapur, Kadegaon tahsil are low in milk production. In Atpadi tahsil milch animals are low but milk production is high while in Jat tahsil milch animals are more comparatively milk production is low.

**Table – 5.3**

**Distribution of Milch Animals and Milk Production (2007-08)**

<b>Sr. No.</b>	<b>Tahsil</b>	<b>Cow</b>	<b>Buffalo</b>	<b>Total No. of Milch Animals</b>	<b>Milk production (in 000 litre)</b>
1.	Shirala	16981	36483	53465	17885
2.	Walwa	25591	74910	100501	65700
3.	Palus	9162	29507	38669	13505
4.	Khanapur	11299	28911	40210	7300
5.	Atpadi	15339	15068	30407	16425
6.	Tasgaon	16961	48099	65060	16000
7.	Miraj	22187	59890	82076	13505
8.	K. Mahankal	19370	25150	44520	9125
9.	Jat	54621	36050	90671	15330
10.	Kadegaon	14251	20247	34498	10220
	District Total	205762	374315	580077	185055

*Source – Live Stock Census Report, Sangli, 2007.*



**Figure No. 5.1**

In the development of dairy farming green fodder for milch animals is most essential. The availability of green fodder for milch animals depends upon availability of water. In the present study, we have attempted to show the co-relation between the percentage of irrigated area, the percentage of milch animals and percentage of milk production.

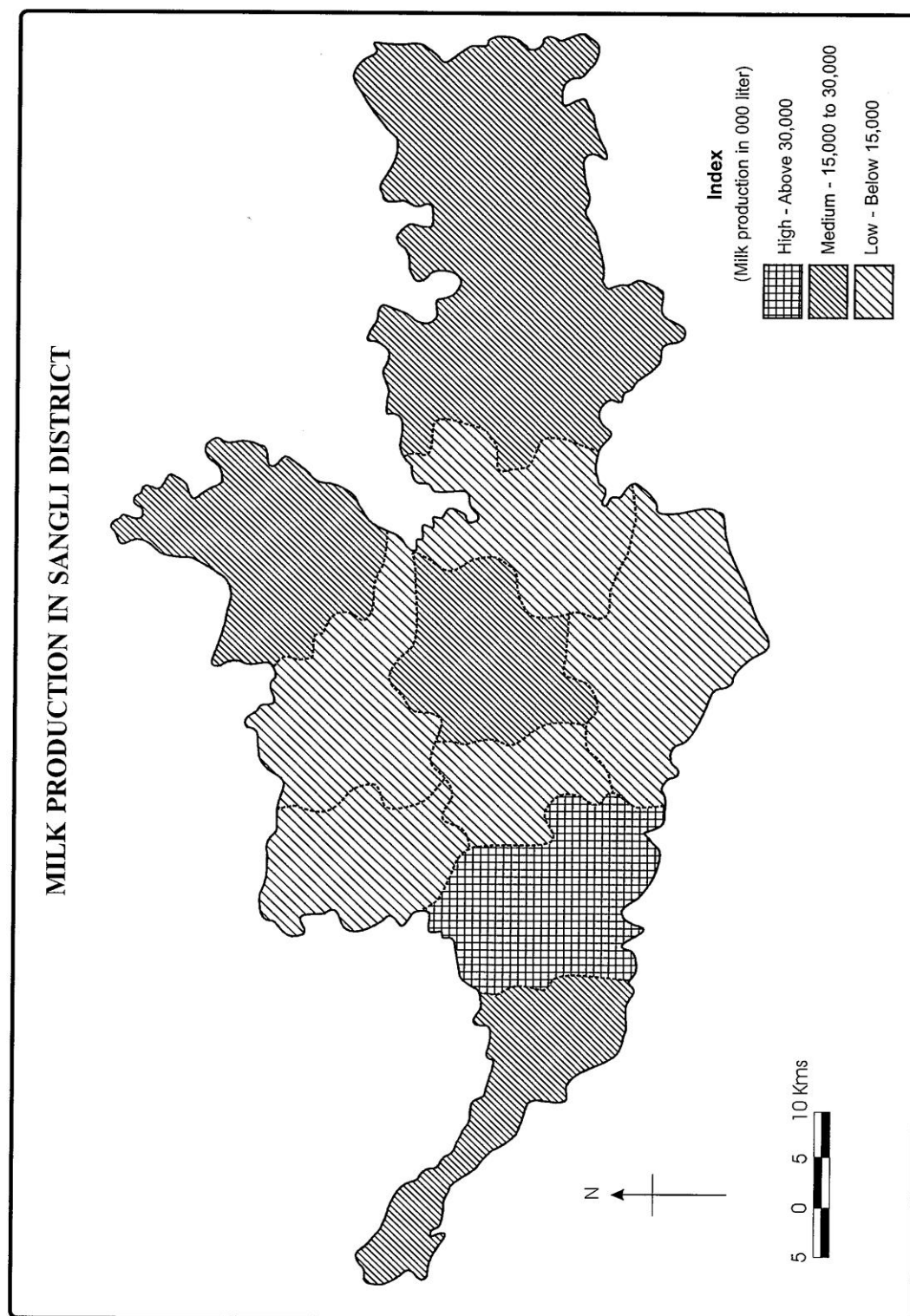
**Table – 5.4**  
**Irrigation and Milk Production**

<b>Sr. No.</b>	<b>Tahsil</b>	<b>Percentage of irrigated area</b>	<b>Percentage of milk animals</b>	<b>Percentage of milk production</b>
1.	Shirala	30.29	9.22	9.66
2.	Walwa	39.42	17.33	35.05
3.	Palus	25.05	6.67	7.29
4.	Khanapur	17.93	6.93	3.94
5.	Atpadi	14.03	5.24	8.87
6.	Tasgaon	22.66	11.22	8.67
7.	Miraj	28.99	14.15	7.29
8.	K.Mahankal	14.83	7.67	4.93
9.	Jat	9.84	15.63	8.28
10.	Kadegaon	30.5	5.95	5.52

*Source – Live Stock Census Report, Sangli, 2007.*

Table No. 5.4 shows that the percentage of milk production and milk animals in Sangli district. Correlates with the percentage of irrigated area to percentage milch animals and milk production have been calculated with the help of Pearson co-relation method. After calculating the co-relation between these factors we get  $r = 0.61$  and  $0.64$ . Indicate value clearly shows the positive co-relation between irrigated area and milch animals and milk production.





**Figure No. 5.4**

According to table no.4.4, in Walwa tahsil irrigated area is 39.40 percent. It is the highest in Sangli district as well as Milk production in Walwa tahsil is 35.05 percent it is also highest in Sangli district. It reveals that irrigation plays the most important role in the development of dairy farming in Sangli district.

## **CHAPTER – VI**

### **MILK PRODUCTION AND MILK PRODUCTS**

#### **6.1 INTRODUCTION:-**

Milk and milk products are indispensable to the growth of the child and to the health of the adult. For the infant, milk is a perfect food, for the growing child, milk and the milk products of the dairy industry are essential foods, and for adults and expectant mothers they are the most important foods. In India, it is generally observed that in the north and west the cow are better milkers, but as one gets to the south and east the milk producing quality deteriorates.

The importance of livestock sector in general and of dairying in particular hardly needs emphasis in a country like India. The major and more widely known contribution of livestock sector is in terms of production of milk and milk products. Apart from milk, this sector contributes meat, hides, skins, organic manure and draft power.

Milk production activity takes place on individual farms of varying sizes. This characteristic of milk production system coupled with perishable nature of milk imposes severe constraints on devising improved system for assembling, processing and distribution of milk and its products.

In this chapter, characteristics of production pattern of milk have been presented. Specially, it covers composition of milk, milk production, price scene for milk and milk products, relative importance of cows and buffaloes in milk production, production ratio and seasonal variation in milk production.

#### **6.2 ROLE OF CO-OPERATIVE MOVEMENT IN DAIRY:-**

The study of dairy activity is not complete without taking into account the co-operative movement in India. Co-operation means working together in a team for attaining certain objectives. The spirit of village communities in India was almost entirely based on the philosophy of co-operation. In the modern co-operative societies may be found at local, regional, national and international levels, where a distinction is made among them on the basis of the extent of area they cover.

The structure of co-operative dairy is as follows –

- 1) The Maharashtra state co-operative Milk Federation Ltd at the top level.
- 2) District or Taluka co-operative Milk Federation at district level.
- 3) Primary co-operative Milk producing societies at village level.

### **6.3 MILK COLLECTION:**

Dairy activity practiced everywhere in study area in Sangli district. The primary milk societies collect milk in village level and supply to the dudhsangh in the Sangli district. This point includes the distribution of dudhsangh and milk collection of the Sangli district.

#### **A. - Distribution of Dudh Sangh in Sangli District:-**

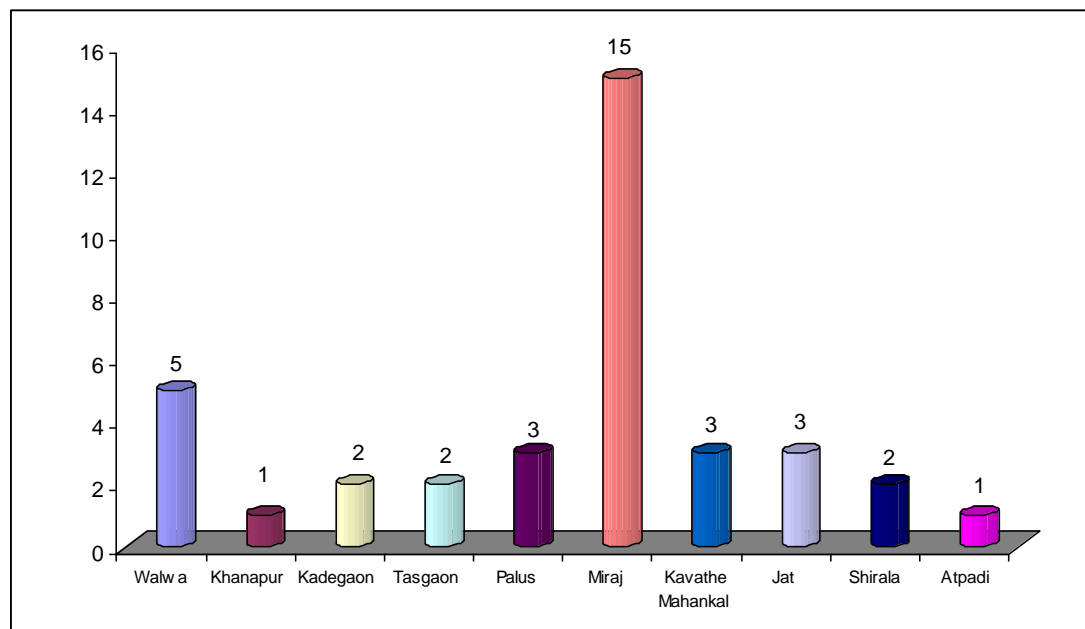
In the Sangli district, there are uneven distributions of dudh sangh. It is shown as table

**Table 6.1**  
**Tahsil wise Distribution of Dudh Sangh in the region**

<b>Sr No.</b>	<b>Tahsil</b>	<b>No. of Dudh Sangh</b>	<b>Percentage</b>
1	Walwa	05	13.5
2	Khanapur	01	2.7
3	Kadegaon	02	5.4
4	Tasgaon	02	5.3
5	Palus	03	8.1
6	Miraj	15	40.5
7	KavatheMahankal	03	8.1
8	Jat	03	8.1
9	Shirala	02	5.4
10	Atpadi	01	2.7
<b>Total</b>		<b>37</b>	<b>100</b>

Source – Compiled by the researcher.

### Tahsil wise Distribution of Dudh Sangh in the region



The table 6.1 indicates that the tahsil wise number of Dudh Sangh and their percentage to total Dudh Sangh in the Sangli district. The table shows the highest number of Dudh Sangh observed in Miraj tahsil as 15, followed by Walwa tahsil as five Dudh Sangh. The number of Dudh Sangh in Kavathe Mahankal and Jat tahsil is same as three Dudh Sangh. The percentage of Miraj tahsil ranked first which is 40.5 percent, followed by Walwa 13.5. The percentage of Kavate Mahankal and Jat tahsil is same as 8.1 percent. The lowest percentage is observed in Khanapur and Atpadi tahsil as 2.7 percent.

#### 6.4 DISTRIBUTION OF PRIMARY MILK CO-OPERATIVE SOCIETIES IN THE SANGLI DISTRICT:-

The primary milk co-operatives are the central agency of the grass-root extension activity. These societies collect milk from the individual members and supply it to the Dudh Sangh. These societies get financial assistance by way of subsidy towards management for an initial period of three years. A reasonable commission is built in to the pricing structure for the primary milk co-operatives.

Tahsil wise Distribution of Primary Milk Co-operative Societies of in the Sangli district (2011).

Table 6.2 indicates the classification of tehsils according to the presence of dairy co-operative societies in the region.

The table 5.2 reveals that the number of dairy societies in the ten tehsils. Table shows that the tahsil of Walwa is highest (266) dairy societies, and the member of societies high (13566).The second is Shirala tahsil 161 societies and also member are 8211.The third is Jat (86) and the lowest societies in Palus and Kanapur respectively 29 and 31 .The table 4.1 show the highest member of societies in Walwa thasil (31.1%) followed by Shirala thasil (18.8)and the lowest in Khanapur thasil (3.3%).The table also show highest per day milk collection in Walwa thasil (180000litre35.5%)followed by Shirala(49000litre9.6%),and the lowest per day milk collection from Khanapur tahsil(20000litre 4.0%)

**Tahsil wise distribution of milk producers Co-operative Societies and Milk Production  
In Sangli District (2011)**

Sr. No.	Tahsil	Total Member		No. of Co- operative Dairy Societies		Total Milk Collection(000li.)		Per Day Milk Collection		Cold Storage
		No.	%	No.	%	No.	%	No.	%	
1	Walwa	13566	31.1	266	31.14	65700	35.5	180000	35.5	3
2	Khanapur	1479	3.3	29	3.39	7300	4.0	20000	4.0	-
3	Kadegaon	2448	5.6	48	5.62	10220	5.5	28000	5.5	2
4	Tasgaon	2295	5.2	45	5.26	16060	8.6	44000	8.6	1
5	Palus	1581	3.6	31	3.6	13505	7.2	37000	7.2	1
6	Miraj	3468	7.9	68	7.9	13505	7.2	37000	7.2	1
7	KavatheM ahankal	2193	5.0	43	5.0	9125	4.9	25000	4.9	2
8	Jat	4336	9.9	86	10.0	1533	8.2	42000	8.2	1
9	Shirala	8211	18.8	161	18.8	17885	9.6	49000	9.6	1
10	Atpadi	3927	9.0	77	9.0	16425	8.8	45000	8.8	1
<b>Total</b>		<b>43504</b>	<b>100</b>	<b>854</b>	<b>100</b>	<b>185055</b>	<b>100</b>	<b>507000</b>	<b>100</b>	<b>13</b>

*Source – District Milk development office Miraj*

## **6.6 PROBLEMS OF PRIMARY MILK CO- OPERATIVE SOCIETIES:-**

The most important factor, the poor performance of primary milk co-operative societies in the region is that they have not realized the crucial importance of increasing milk yield per animal by better breeding and feed etc. A major area of weakness of primary dairy co-operatives is that they function merely as milk vendors, purchasing milk from the members and selling it to the Dudh Sangh. Dairy development is an integrated process. Unless the primary milk co-operatives adopt an integrated approach, success will always avoid them. If the integrated approach is brought within the reach of the small farmers it definitely yields results. This has been well demonstrated by the co-operative union at Anand in the Kaira district of Gujarat. The small holdings which were not viable in the controlled areas have been rendered viable in the cattle development area owing to greater reliance on dairying by small farmers rather than on crop production.

### **6.6.1 FINANCE FOR DAIRYING:-**

Various banking agencies are also engaged in extending loans for purchases of milch animals. State Bank of India has a special scheme of loaning for purchase of milch animals under Government Guarantee. The major objective of the finance policies of the banks was to introduce the improved high yielding milch animals in the region. The loans were disbursed to the dealers, sellers or the representative of the primary milk co-operatives. In most of the cases the animals were purchased through the chairman or the secretary of the dairy co-operatives.

### **6.6.2. MARKETING OF MILK AND MILK PRODUCTS:-**

Milk, being a liquid and perishable product requires a strong marketing infrastructure to collect the surpluses from producing areas and transport and distribute the product in consuming areas. Therefore, simultaneous efforts to encourage production and to arrange for marketing the surpluses are necessary. This simultaneity of efforts took place in 1970, when an integrated programme of dairy development coupled with organized marketing of milk, named as Operation Flood- I was started in the country. It was designed to establish a linkage between rural milk producers and urban consumers by replicating the 'Anand Pattern' of dairy co-operatives in the country. Indian Dairy Corporation was established for implementation of the project. The major activities in the



second phase of these programme were organization of village and district level co-operatives of milk producers and setting up of processing capacities and marketing facilities in rural milk sheds as well as in urban consuming Centers.

There is very little scope marketing of milk in the Sangli district except Sangli and Miraj. Tasgaon, Vita as these urban areas themselves produce the required quantity of milk. The milk vendors from the nearby villages regularly supply milk to these urban area. Sangli and Miraj city is the major market for fluid milk and milk products. Milk is also made available to the urban consumers but the quantity of milk is almost negligible as compared to total urban demand. The dairies in Sangli city have collecting milk and making by products in large scale and also selling the milk and milk products in sangli as well as Miraj city.

The surplus milk in the region is converted into milk products such as ghee, cream, milk powder, butter, shrikhand etc. The remaining quantity of milk has processed by chilling and pasteurization and it is dispatched to Bombay, Pune, Bangalore and Belgum.

#### **6.6.3. PRODUCTION OF MILK PRODUCTS:-**

Various milk products are the preparations made from milk to suit human taste and for application in various arts and industries. A broad classification of the milk products with short descriptions of their properties and characteristics will be found interesting here. The main classes into which milk products may be grouped are-

- 1) Cream
- 2) Butter
- 3) Ghee
- 4) Condensed Milk
- 5) Casein
- 6) Cheese
- 7) Milk Sugar
- 8) Milk Powder
- 9) Curd
- 10) Khoa / Khowa

### **1. Ghee:-**

In India, Ghee is chiefly made from the milk of cows and buffaloes. Ghee is obtained by melting butter and eliminating the traces of curd which may still remain in the body of the butter. Like butter, ghee is mainly of two types, viz. cows and buffaloes and has got characteristic properties of their own. Buffalo ghee is white while the cow ghee is just yellowish. The yield of ghee from the butter of the buffalo is higher than from that of the cow. Ghee is perhaps the most widely employed among the milk products in daily diet of Indians. There are 4 dairies making the production of ghee.

### **2. Butter:-**

Butter is one of the most important products that have milk as their basic ingredient. Butter is a wholesome diet as it contains from 8 to 10 per cent of the soluble and volatile fatty acid group of fats whereas other fats contain only 1 to 3 per cent. Butter is made from the milk of both cows and buffaloes.

### **3. Curd:-**

In general it is known as 'Dahi'. This is another preparation of milk and is much esteemed in Indian homes for its delicious taste and beneficial action on the digestive functions. Dahi prepared for sale is generally made from buffalo milk because it gives a firmer texture and does not break up when cut and sold in small lots. Dahi is also used in the preparation of fish curries and in the making of whey. In Sangli district six dairies making 1185 kg/per day curd production observed.

### **4. Khoa / Khowa:-**

Khoa is the vernacular name applied to milk thickened to semi solid consistency by the evaporation of its water. For making khoa milk is heated very slowly in a shallow thick boiling pan and as it is being heated it is stirred constantly in order to prevent the formation of skin and also to accelerate the evaporation of water. Khoa properly prepared is white in colour and has good flavor. The flavor of the khoa depends upon the richness of the milk and the care taken in preparing. For khoa manufacture, buffalo milk is largely

in demand, because cow milk not only makes yellowish khoa, but lacks body and texture. The outturn from cow milk is also less compared with that from buffalo milk.

#### **5. Milk Powder:-**

Milk powder is made from cow's milk to which sugar or salts may or may not have been added and which has been evaporated to dryness either under atmospheric pressure or in vacuum. It is indispensable in making tea at off times when fresh milk is not available. In the Sangli district, there are two milk industries making the milk powder in which Government dairy, Miraj has ranked first as 1000 tons per day making milk powder.

## CHAPTER – VII

### CONCLUSIONS AND SUGGESTIONS

The present study deals with the dairy activity are a subsidiary to agriculture in India. Agriculture is known as gamble in the monsoon due to inadequate and irregular rainfall. In India, where 80 per cent of the farmers are small holders, agriculture should be supplemented with the subsidiary occupation such as dairying, poultry, sheep rearing, cattle breeding etc. In those activities, dairy is leading activity and plays a vital role in the rural economy. Dairy helps to tackle the problem of unemployment. Dairy is being used as poverty eradication because it provides employment to the rural landless, small and marginal farmers with supplementary employment and regular source of income and ultimately helps them to increase the standard of living.

The Sangli district is a part of Krishna Basin, divided into north-western, central and south-eastern parts. The rivers Yerala, Agrani and Krishna make the region partly irrigated. The Sahyadri ranges determine the climate of the region and fall under monsoon land. The rainfall is uncertain and hence subject to frequent famine in the region. The region has arid tracts and fallow lands which enhance the dairy activities in the region.

Agriculture is the mainstay of the economy of the region. Food grains and cash crops are taken. Jawar and Bajara are main food grains. Sugarcane, Oilseeds, Fruits, Cotton, Vegetables are cash crops. Sugarcane is largely cultivated in irrigated areas.

The rivers Krishna, Yerala and Agrani are main source of irrigation. The highest percentage of irrigation (37.47%) is observed in Palus tahsil while lowest percentage is mainly covered by irrigation projects and canal irrigation dominates the region. But in the areas of Miraj, Sangli and Palus tahsil water logging Problem is created due to oversupply of water.

Generally 80 percent livestock of Sangli district depends on natural green grass in rainy season and dry fodder in summer season. In monsoon period, the green fodder availability is sufficient to livestock. But in summer season, the supply of green fodder is not sufficient to livestock. Therefore, in summer season livestock seems week. The livestock distribution depends upon the climatic conditions and fodder availability. The

green and dry fodder and concentrate feed are the main three sources of fodder and feed for livestock feeding. Generally the large numbers of livestock are found in areas where good quality of fodder is available in sufficient quantity. Low quality of feed is always responsible for low quality and quantity of milk in dairy activity.

Concentrate is the rich source of protein which contains 30 to 35 percent proteins. The protein content of the green fodder varies from grasses which are low in protein, to leguminous fodder species which are a rich source of protein.

In the irrigated areas of the Sangli district, green such as grass, ghas (special fodder), Maize, Kadwal grow throughout the year but in the non-irrigated areas green fodder is grown only in the rainy season. In the irrigated tract, dairy operators use sugarcane and its residues. Besides this, during the summer season Maize is also cultivated both in the irrigated and the non-irrigated region as green fodder. The price of green fodder during the summer season is very high which indirectly affects the price of milk.

If green feeds and fodders are available, the cost of milk production will be lower. If the animals are maintained on straws and concentrates the cost of milk production will be too high. Further, adequate minerals will have to be provided.

In the total ratio of dairy animals, the percentage of roughage is quite high. All the milk producers in the region use roughage for dairy animals throughout the year. Dry grasses, wheat straw, sunflower straw, Jowar straw (Kadba) are the major crop residues for dairy cattle.

Dairy industry started in the Sangli district during 1970. It has attained substantial development during last four decades on co-operative basis. Dairy is the major source of income for landless, marginal, small, medium and large farmers. It has an important bearing on the economy of the rural people. Along with the cultivation of crop, the milk animal and the fodder available from their farms has been utilized to feed milch animals. Such inter relationship has been encouraged farmers to their attention towards dairying. Besides the positive role of co-operative in the collection and distribution of such perishable commodity, farmers also, fight the development of farming in the Sangli district. It aims as to provide hygienically processed milk to people in the cities at reasonable rate and provides subsidiary occupation to farmers, landless labors, etc.

Presently in Sangli district nine milk unions are working in dairying. The district milk union collected about 338067 liters of milk per day in 2006-07.

Rajarambapu Patil Co-operative Milk Union is one of the most important milk unions in Sangli district. It has provided employment opportunities, subsidiary occupation, irrigation, insurance, loans, and other facilities to the members of the union. So that it has helped to raise the living standards of the people belonging to Walwa taluka in comparison with other tahsil of Sangli district.

The Co-operative movement played significant role in the dairy development. There is wide scope and potential for production and marketing of milk through co-operative movement in the region. It helped to increase economic status, mostly of marginal farmers and agricultural laborers in the region. The participation of women is noteworthy in generating income through dairy activity.

The primary milk co-operative societies are central agency of the grassroots extension activity. These societies provide milk to Co-operative Dudh Sangh in the region. The total number of dairy societies is 885, 31 March 2009.

Annual milk collection of Sangli district is 18505530 lakh liters (2008-09). The region consists of chilling facilities at Walwa, Shirala, Kadepur, Tasgaon, Miraj, Sangli, Kavathe Mahankal, Ranjani and Jat. Miraj Chilling Center has a capacity of 1, 50,000 liters per day. Ice Production of the region is about 178 tons per day. (2009-2010)

The year 2007 to 2010 percentage of cows in milk increased from 48.4 percent to 61.4 percent while she buffaloes in milk increased from 59 percent to 62.6 percent during the decade of 2007 to 2010. The highest density of milch animals is in Walwa and lowest density of milch animals is in Jat tahsil.

The region is known for local breeds of milk cattle. Khillar, Dangi, Jersey and Deshi breeds are found in the region. The crossbreeding programme is also taken by various agencies. The cattle breeding Center named as 'Valumata Sangopan Centre' at Jat. The intensive cattle development Project is implemented and located at Miraj and covers all the Tehsils of Sangli district including artificial insemination work is done at the Centers as well as at villages by trained doctors. A few local persons also trained for insemination work.

In Sangli district 854 Primary Dudh co-operative Societies are established but distributed unevenly. Walwa tahsil has highest number of Dudh Societies (266) and Palus has lowest number (31).

In the region, cows and she buffaloes are used for milk production. The total milk Production ratio of cow and she buffalo is 3.96 and 3.93 respectively in the region. The milk production ratio of cows (0.53) and she buffaloes (0.53) were found highest in Walwa tahsil. The lowest production ratio of cows (0.46) and she buffaloes (0.41) are seen in Jat tahsil.

The Sangli district is well covered under the animal health and disease control programme. Most of the animal husbandry and veterinary services available in the region. The region has 6 veterinary polyclinic, 106 veterinary dispensaries and 22 veterinary aid Centers. There is one cattle breeding Center established in Jat named as 'ValumataSangopancentre'. About artificial inseminations carried out at 59 A.I. Centers in the Sangli district. (2003-04)

### **SUGGESTIONS:-**

In the Sangli district, there is scope to develop dairy activity on extensive commercial scale. Some of the suggestions to improve the situation and solve various problems faced by farmers and dairy societies are given as below:-

1. The nature of commodity and its marketing demand heavily depends upon the managerial skills of the farmers. Therefore, suggested that it is training and education of farmers in handling, selling and pricing, herd management, knowledge about qualitative aspects of milk and its products should be given.
2. A very few educated people practice this activity. For increasing the milk production and lowering the cost of milk production educated and well trained people should enter into dairy activity.
3. The milk producers do not maintain the records of income and expenditure of dairy and related operations. It is suggested that the record should be maintained for there own better performance.
4. By constructing the gobar gas plants in the region, fuel problem can be minimized. Therefore, it is suggested that DudhSangh should provide loan and maximum

subsidy (75%) to them and make efforts to increase the awareness about the importance of gobar gas.

5. The main aim of practicing the dairy activity is to make more profit from milk, calves and dung. Therefore, it is suggested that high yielding varieties of cows and she buffaloes should be provided to the farmers by DudhSangh.
6. The price of milk does not increase as the expenditure increases. Therefore it is suggested that, the price of milk should be increased in relation to the price of fodder and concentrate feeds, which has a major impact on the production cost of milk.
7. The overhead cost, particularly on administration must be strictly controlled.
8. Strict control on quality testing must be followed by using electronic instrument of testing Fat and SNF.
9. It is suggested that more varieties of crossbreed cows and she buffaloes should be made available to the milk producers as per the climatic conditions of the region.
10. The extension education and training programmes related to maintenance and health care of milk animals be extended to all the villages in the Sangli district.
11. Government should develop small milk processing units which help to increase the income of milk producers.

By considering the suggestions given above, the dairy activities in the region should be strengthened for the economic development of the region.



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# QUESTIONNAIRE

[MILK PRODUCER]

**Village Name –**

1. Name of milk producer-----
2. Age ----- Years      Qualification-----
3. Occupation – 3.1 Main occupation -----  
3.2 Subsidiary occupation -----
- 4 Information of Family:-
- 5 Litre ers in Family Members – Total ----- Litre ate ----- Illitre ate---6 Land

Sr. No	Name	Age	Occupation	Qualification	Annual Income (Rs)	Sr. No.	Name	Age	Occupation	Qualification	Annual Incomes (Rs)

Holding Capacity in Acres

Landless	Up to 5	5 to 10	Above 10

## 6.1. Irrigated Area (Acres)

Up to 5	5 to 10	Above 10

## 6.2) Non – Irrigated Area (Acres)

Up to 5	5 to 10	Above 10

7. Means of Irrigation - well / Tube well / canal / Lift irrigation / other.

8. Information of cattle :-

No. of cows -----

No. of she – Buffaloes-----

Goats ----- Sheep's

----- A bull -----

----- Calves – cow -----

----- Bullalo -----

9. Milch cattle –

Cows – Deshi ----- crossbreed -----

She – Buffaloes – Deshi ----- crossbreed -----

Other – Deshi ----- crossbreed -----

10. Availability of Veterinary Facilities - Yes / No.

11. If yes - Private / Government.

12. Average Annual Income of Family (in Rs.)

Agriculture -----

Dairy -----

Employment -----

Business ----- Labour

----- Other -----

-----13. Annual Income Group –

Up to 50000	50001 – 100000	100001 – 150000	150001 – 200000	Above - 200000

14. Available of cowshed.

Yes / No.

15. No. of persons involved in the Dairy occupation. –

Male ----- Female ----- Total -----

16. Average Daily Milk Production (in litre s)

Cows ----- she – Buffaloes ----- Total -----

17. Milk selling method –

Milk Societies			Vendors	Consumer
Private	Co – operative	Government		

18. Capital supply Institutions :-

Government		Banks			Co operative Institution	– private
Central	State	National	Co operative	Scheduled		

19. Capital supply (in Rs)

Up to 25000	25001 – 50000	50001 – 75000	75001 – 100000	Above 100000

20. Have you visited Modern Dairy Plant / Project.

Yes / No.

21. Cropping Pattern.

21.1 Fodder crops -----

21.2 Other crops -----

22. Planning for excrement and Urine –

22.1 As a use of bio – fertilizer in Agriculture

Yes / No.

If yes, in tons -----

22.2 Sale

Yes / No.

If yes – Income in Rs.

22.3 To produce of Biogas / Biogas Electricity.

Yes / No.

23. Availability of infrastructural facilities in home

23.1 Nature of Home-Hamlet/simple/cement/Rcc.

23.2 Electricity

Yes/No

23.3 Toilet

Yes/No

23.4 Vehicle---Bicycle/Two wheeler/Three wheeler/Four wheeler/Tractor

23.5 T.V./Radio/Fan/Freeze.

23.6 Other



24. Are you totally satisfied by Infrastructural facilities in Home Yes/No.

If No – Why-----Expectation -----

-----

25. Whether you have a member of milk products co-operative Institute ? Yes/No.

26. Are you change you cropping pattern from last 10 years. Yes/No.

If yes – New cropping pattern. -----

-----

Signature

## QUESTIONNAIRE (MILK SOCIETIES)

1. Name of milk society : -----

Establishment -----

2. Private/Co-operative/Government

3. Registered Yes/No.

4. Affiliation to which Sangh -----

5. Information of milk collection-

Year	Member	Milk Collection in litres			
		Cow		She Buffalo	
		Flush	Lean	Flush	Lean
2005-06					
2006-07					
2007-08					
2008-09					
2009-10					
2010-11					
2011-12					
2012-13					

6. Average Daily Milk collection (litres)– Cow ..... She Buffalow.....Total .....

7. Milk selling by which Sangh- Government/Taluka level/District level/Private.
8. Transportation cost given by Sangh - Yes/No.  
If yes per litres (Rs.) -----
9. Rate of milk (per Fat in Rupees) – Cow ----- She buffalo -----  
Rate of milk given by milk producers (per fat in Rs.) Cow ----- She buffalo -----
10. When and How to pay the bill - Days/weekly/fortnightly /monthly  
By cash / By cheque / other.
11. Service and facilities provided to milk producers –
- 11.1 Loan provided Yes/No.
- 11.2 Training related Dairy occupation – Yes/No.
- 11.3 Feed provided by credit Yes/No.
- 11.4 Veterinary Facilities Yes/No.
- 11.5 Import and supply of crossbreed cattle to milk producers. Yes/No.
12. Total No. of workers .....

Qualification	No. of workers	Monthly Salary in Rs.
Upto X		
XI – XII		
Graduation		
Post – Graduation		
Total		

13. Methods of milk collection -----
14. Which precaution taken when milk purchasing -----

14.1 Checking of milk Yes/No.

14.2 Purchase the low quality milk ? Yes/No.

15. Which precaution taken for milk unwaste -----  
-----

16. If waste the milk -----  
-----

17. Problems of milk societies –

17.1 Means of Transportation Yes/No.

17.2 Road Facilities - Yes/No.

17.3 Rate of Milk - Yes/No.

17.4 Government Policy Yes/No.

17.5 Other -----  
-----

18. Annual Turnover –

Year	Total Income (000' Rs.)	Total Expenditure (000' Rs.)	Profit/Loss
2005-06			
2006-07			
2007-08			
2008-09			
2009-10			
2010-11			
2011-12			
2012-13			

19. Have you provided Bonus or Gift to milk producer – Yes/No.

20. Suggestions - -----

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-----

Signature.

## QUESTIONNAIRE (DUDH SANGH)

1. Name of Dudh Sangh -----

Establishment -----Private/Co-operative/Government

2. Information of collection centres.

Year	Members	No. of milk collection villages	No. of milk collection centres.
2005-06			
2006-07			
2007-08			
2008-09			
2009-10			
2010-11			
2011-12			
2012-13			

4. Average daily milk collection (litres).

Year	Cow		She Buffalo	
	Flush	Lean	Flush	Lean
2005-06				
2006-07				
2007-08				
2008-09				

2009-10				
2010-11				
2011-12				
2012-13				

5. Rate of milk provided by milk societies – (per fat in Rs.)

Year	Cow	She-Buffer
2005-06		
2006-07		
2007-08		
2008-09		
2009-10		
2010-11		
2011-12		
2012-13		

5. When and how to pay the bill - Days/Weekly/Fortnightly/Monthly/

By Cash / By Cheque /other.

6. Total No. of workers -----

Total monthly salary in Rs. -----

7. Which processing by milk -----

-----

8. Making by products (Annual)

Sr.No.	Milk Products	Production in tons `	Amount in Rs.
01	Ghee		
02	Butter		
03	Curd		
04	Khoa		
05	Shrikhand		
06	Amrakhand		
07	Panir		
08	Basundi		
09	Other		
	<b>Total</b>		

9. Sale of milk ----- litres ----- Rs.

10. Daily milk potential (in litres)-----

11. Actual milk collection (in litres) -----

12. Grants from Sangh – in Rs. -----

Year	Purchasing of cow and she-buffalo of	Construction of cowshed	Feed	Purchasing of machine	Other	Total
2005-06						
2006-07						
2007-08						
2008-09						



2009-10						
2010-11						
2011-12						
2012-13						

13. Milk Distribution centres -----

14. Milk products distribution centres -----

15. Whether Sangh have provided the veterinary facilities Yes/No.

If yes, Rate of visit(in Rs.)-----

16. Transportation cost (per day in Rs.)

	Transportation cost of milk collection	Transportation cost of milk Distribution
Milk transportation cost		
Rate of Milk		

17. Whether Availability of cold storage facility? Yes/No.

If Yes -

17.1 No. of cold storage -----

17.2 Capacity of cold storage (in litres) -----

18. Annual Turnover -

Year	Total Income in 'lakh'	Total expenditure in lakh	Profit/Loss
2005-06			
2006-07			

2007-08			
2008-09			
2009-10			
2010-11			
2011-12			
2012-13			

19. Crossbreeding programme -----

-----

Signature