CHAPTER - I

4.5

# INTRODUCTION

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#### SECTION - A

#### 1.1 INTRODUCTION :

Agriculture happens to be the primary activity in India and dairy farming has been considered as a subsidiary occupation. In India, dairy farming began in 1889 when Military Dairy farms were started in Cantonment areas at Allahabad in Uttar Pradesh consisting of sixty farms with thousands of crossbreed cows. After the independence, the Government of India encouraged dairy industry all over the country. The National Dairy Development Board was established in 1965 at 'Anand' in Gujarat state. This was followed by the planned development of dairy farming in West Bengal. Today, a network of some eighty farms, including fourty two cattle-holding farms, dot the country.

Co-operative Movement is recognised 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. Alike the Green Revolution, the Government of India has also adopted 'White Revolution' through the National Dairy Development Board. Presently, dairy has been properly organised on co-operative basis in Maharashtra and other states of India. Besides this, 'Operation Flood Programme' was introduced, in different stages, to promote the dairy development in the country. The Operation Flood Phase - I, started in 1970 aiming at to supply milk to urban areas which was implemented

during 1970 to 1981 covering four metro cities i.e. Delhi, Bombay, Calcutta and Madras. Operation - II was designed to build on Operation Flood Phase - I . It covered the states of Karnataka, Rajasthan, Madhya Pradesh till March, 1985. Phase - III has been implemented during 1985 to 1990. It aimed at increasing rural milk procurement to the tune of 183,000,000 litres collected from eight million milk producer families by 1990. Thus, operation flood has successfully developed an institutional framework linking with sixty lakh milk producers in nearly sixty thousand villages with markets in five hundred towns and cities.

Maharashtra is third largest state in the country occupying nearly 9.36 percent area possessing about 8.03 percent of total livestock population in India. According to the livestock census of 1978, the state had 29.64 million heads of livestock. Of this, 15.22 million were cattle, 3.90 million buffaloes, 2.64 million sheep, 7.56 million goats and 0.32 million other livestock.

Presently, there are seventy tahsils and district dairy sanghs, 13,000 primary milk producing co-operative societies spread all over the Maharashtra. Everyday, about eight lakh litres of milk is sent to West Bengal, Bihar and Madhya Pradesh. The annual output of milk has gone up significantly from the level of 1.6 million tonnes in 1980-81 to 2.9 million tonnes in 1990-91. Greater Bombay Milk Scheme meets 55 percent of demand

of milk through its 3914 booths and 1021 institutions like hospitals, canteens and hotels. There are Arrey (1951), Worli (1961), and Kurla (1975) dairies. These dairies help to meet the needs of cosumption in Bombay and its suburbans ultimately depending upon the milk supply from rural Maharashtra. In 1991, Maharashtra ranked tenth regarding milk production in India.

The proposed work is concerned with the geographical enquiry of dairy farming in Solapur district which is situated on the south-east fringe of Maharashtra state and lies between 17°10' and 18°32' North latitude and 74°42' and 75°15' East longitude. It comprises an area of 15021 sq.kms which is 4.88 percent of the total area of the state. Of this urban areas accounts for 414 sq.kms and rural for 14607 sq.kms.

Livestock occupies an important place in the agricultural economy of the district. A pair of bullocks for draught and cow or buffalo for milk and manure are commonly found in the region. Despite the spatial variations in milch animals and milk production the region contributes largely to total milk produce of the state.

The programme of dairy development in the district aims to provide hyginically processed milk to the people at reasonable rates and also to provide a subsidiary occupation to farmers. There are two important co-operative organisations viz. Solapur

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Dudh Utpadak Sangh comprising the area of ten tahsils and Shivamrut Dudh Utpadak Sangh, located at Akluj, covering all villages of Malshiras tahsil alone.

According to 1991 census, there are 12 lakh livestock in Solapur district. Of this, 1.5 lakhs are milch animals i.e. 83676 (6.95%) are cows and 69217 (5.75%) are buffaloes. Beside this, there are 159,290 (13.23%) bullocks, 280,930 (23.23%) sheep, 594,253 (49.34%) other animals.

#### 1.2 THE PROBLEM :

Dairy farming has become an important tool for rural transformation in the region. It offers employment opportunities to the people directly and indirectly. It is full time job requiring milking and feeding of milch animals in time for which time is consumed in managing such enterprise. Besides, for transportation and marketing the products it requires more labour. It provides additional income to farmers by which their living standard has been uplifted. Moreover, landless, farm labourers, marginal and small farmers are highly benefited from this enterprise. Farmers receive regular income by which they can meet their daily requirements. Thus, dairy farming has far-reaching influence on rural economy.

The dictionary meaning of the term 'Dairy Farming' is keeping the milch animals for milk which is processed in the milk plants and distributed. It is closely associated with

agriculture which provides fodder to milch animals. Thus, the term 'Dairy Farming' here refers to keeping the milch animals for milk to be marketed and milch animals are kept alongwith other draught animals. The farmers carry this subsidiary activity which is the part of agriculture in our country.

Presently Solapur district has been emerged out as one of the progressive parts regarding milk product. The nature of dairy farming consists of keeping the milch animals alongwith other animals by the farm families and the fodder is obtained from agricultural land as the residue of crops. Besides this, in the irrigated areas, the sugarcane being dominant crop, provides tops as green fodder. The village milk co-operatives are linked with the district co-operatives. They provide financial assistance to as well as looks after the collection and distribution of milk. The farmers receive reasonable prices which have been fixed by the state government from time to time. The feeds are also supplied to member milk producers by cooperative organisations. Thus, the co-operative movement has reached to grassroot level i.e. village level. However, there is intra-village or intra-regional variations in the development of dairy farming in Solapur district. The region has witnessed spatio-temporal variations in the fodder availability, in milk production, milk productivity, concentration of milch animals etc.

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In view of this, the present work is proposed to undertake a geographical enquiry of this enterprise which has influenced the economy of the region. The main purpose is to map and analyse spatio-temporal variations in the number of milch animals, their concentration, fodder availability and its requirements, milk production and distribution.

#### 1.3 OBJECTIVES :

The main objective of the work is to map and analyse the spatio-temporal developments of dairying in Solapur district. However, some specific objectives are as follows -

- (i) To map and analyse the spatio-temporal patterns of animal associations regions and to map and examine the spatio-temporal patterns of milch animals in the region.
- (ii) To assess the availability of fodder and its requirement in the region.
- (iii) To map and analyse spatio-temporal patterns of milk production at tahsil level and to study the distribution of milk products of the district.
- (iv) To examine the development of dairying at micro level by undertaking case studies.

#### 1.4 DATA BASE AND METHODOLOGY :

Primary and secondary data have been employed here. The primary data, pertaining to per capita milk availability, per animal milk production has been collected through field work by employing sampling, questionnaire, shcedule and interview techniques wherever necessary. The secondary data has been collected from the published records like annual reports of district dairy, animal census, district statistical abstracts, district census handbooks, district gazetteers, reports of the state level committees. The collected data have been processed by employing some appropriate statistical techniques. The procedure of these techniques have been discussed in the respective chapters. The use of maps and tables has been made according to their suitability. The unit of study is tahsil and in the case studies, villagewise study is attempted. For the temporal analysis the study is made at two point of time i.e. 1971 and 1991.

#### 1.5 SELECTION OF THE REGION :

The author is motivated to select Solapur district for the following reasons.

- ( i ) It is the home district of the author.
- (ii) The district has experienced dairy development during the last three decades which has influenced the rural economy largely.

- (111) Dairy farming is regarded as an integral part of the agriculture in the region.
- (iv) Dairy farming of this region has not been
  studied yet by the Geographers.

#### 1.6 REVIEW OF LITERATURE :

The experts in different desciplines have produced literature on dairy farming. Glimmer D.A. (1970) studied the spatial distribution of livestock in the Republic of Ireland. He studied the vital importance of livestock in the rural economy and observed regional variations in the concentration of livestock. He employed Weaver's modified technique for studying animal association regions in Ireland and accordingly delineated the livestock regions.

In India, the experts in agricultural science have studied different aspects of dairy farming. Randhwa M.S. (1962) made a detailed study of Indian agriculture and animal husbandary. He observed that dairy was supplementary occupation in the agricultural farming system in India. He studied the regional variations in milk productivity of cows and buffaloes. Council of scientific and Industrial Research, New Delhi (1970) published literature on Indian Dairy. Gore K. (1969) studied Iresh Agriculture which was mixed in nature and closely associated with livestock. He found that cows were the initial source for milk production, but the observed that there was pronounced

regional variations in the pattern of dairy farming. Mishra (1979) studied the development of cattle and dairy. Mira (1974) made a detailed study of livestock in India. Ghosh (1974) analysed the requirements of feed and fodder to the existing number of cattles in the country. He also calculated the availability of feed and fodder in the country. Godbole (1975) concentrated his attention on the agricultural research in Maharashtra. Sharma and Coutinho (1978) made an exhaustive work on the animal husbandary of India. Khan (1979) made an another attempt to study the dairy development and its contribution to rural prosperity. He has discussed the operation flood scheme-I in detail. Vishwanathan (1979) studied the role of co-operatives in dairy development in India. He found that per capita availability of milk was less than 110 grams per head per day. Joshi and Jha (1981) made a pioneering work on livestock of Arunachal Pradesh and observed that there was scope for the development of livestock and poultry in this hilly state. Koli (1985) made a critical study of co-operative dairy development of Kolhapur district of South Maharashtra. Gopalkrishnan (1986) made an attempt to study livestock and poultry enterprise in relation to rural development. Inamke (1987) made an economic evaluation of dairy co-operatives in Solapur district. He also (1989) studied the economic efficiency of dairy co-operatives in Solapur district. Recently Ramanujan (1992) highlighted the role of dairy farming-in rural development, especially dealing with the co-operative

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dairy in Maharashtra. Kumar and Paniprasad (1993) have recently studied the dairy animals in our country. They observed qualitative and quantitative aspects of milk production. Various problems of milch animals were analysed by them. Chattopadhyay (1993) considered dairy as the second labour source in India. He studied the distribution of milk and the nature of co-operative dairying. It is obvious that geographical enquiry of dairy farming has been neglected in the state.

### 1.7 OUTLINE OF THE WORK :

The present study entitled, " Dairy Farming in Solapur District : A Geographical Analysis," can be divided into six chapters. The first chapter is divided into two sections. The introduction emphasising on the nature and scope of the study, objectives, methodology, and review of literature included in the first part and profile of the region has been studied in the second section.

The second chapter deals with the Animal Husbandary in Solapur district which is also divided into two sections. The distribution and animal association regions in Solapur district is studied in the first section and study pertaining to spatiotemporal analysis of milch animals is attempted in the second section. An attempt has been made to assess the fodder and feed resources and their requirements in the region in the third

chapter. The collection and distribution of milk have been studied in the chapter four. This chapter is also divided into two sections. Milk collection is studied in Section - A and Section - B is concerned with the distribution of milk in the region.

Micro level studies are made i.e. case study of Shivamrut Dudh Dairy, Akluj and of two villages is made in the fifth chapter. The last chapter (i.e. sixth) is concerned with conclusions of the work.

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#### SECTION - B

#### 1.8 PROFILE OF THE REGION :

#### 1.8.1 Physiography :

This section deals with a brief account of the physiographic setting of the region which leads to intra-regional disparities in dairy development. The district lies entirely in the Bhima-Sina-Man river basin. It is bounded by 17°10' North and 76°15' East longitudes (Fig.1.1 and 1.2). It comprises of an area of 14844.6 sq.kms which is 4.82 percent of the total area of the state as per 1991 census. The total population of the district is 3,224,034 of which 2,295,135 is rural (71.19%) and 928,899 (28.81%) is urban as per 1991 census.

#### 1.8.2 The Terrain :

The relief is an important element of the ecological setting which determines land utilization pattern. Physical environment has an important bearing on agriculture and dairy industry too. The quantity and quality of fodder is invariably related to the environmental factors. Thus the study of such aspect is essential to understand the nature and extent of dairy development in the region. The effects of altitude are felt indirectly through climate and soil (Shinde 1980). Besides this, terrain has the most potent influence on landuse and on the growth and distribution of crops (Singh and Dhillon, 1984). The region has two major relief features.



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Fig. 1.1



Fig. 1.2

# (a) Hilly region -

Solapur district consists of the part of Deccan table land. Balaghat ranges pass for a few kilometers in the north of Barshi tahsil. There are also scattered hills in Karmala, Madha, and Malshiras tahsils (Fig.1.2)

#### (b) The plateau -

The district consists of plateau part with its local variations in relief. The regur soils are quite deep, fine textured, loamy and agriculturally more productive. The dotting of residual knolls all over the district, as a whole, forms a waving plateau. The plateau has broad depressions in the north-south direction occupied by valleys of Bhima and Sina rivers (Fig.1.2).

#### 1.8.3 Climate :

The climate of Solapur district is typically monsoonal in character with hot, rainy, cold weather seasons. In the large measure, climate determines where man may live and thrive what crop he may raise (Whitbeck, 1932). Climatically, the entire district falls in the rainshadow area. The south-west monsoon, with its spatio-temporal variations has greater impact on the regional pattern of agriculture and dairy too. The average rainfall variability excesses 30 percent which affects agriculture adversely (Fig.1.5). During the south-west monsoon average annual rainfall of the region is 600 mm. However, the Rabi crops depend



retreating monsoon during October and November. The regur soils retain water moisture sufficiently for Rabi jowar which provides foodgrains as well as fodder considerably. Figures 1.4 A and B indicate that almost all tahsils have witnessed substantial rainfall during post-monsoon period.

#### a) Temperatures -

The temperatures vary from season to season (Fig.1.3). It rises appreciably during the months of March and May which further decreases gradually in rainy season (Fig.1.3). The low temperatures are recorded from November to February. The maximum temperature is observed at Solapur (45.6°C in 1939) and the lowest minimum was 4.4°C on 7th January 1945.

# b) Rainfall -

The paucity of total amount of rainfall and large variations both in extent and distribution in different years makes the agriculture almost a gamble on the rains. The average annual rainfall in the district is 600 mm. The regions having less than 700 mm annual average rainfall may be considered as draught prone areas (Barai,1978). The region, therefore, can be defined as draught-prone area. About 17 percent of the normal annual rainfall in the district is received during September to November which is favourable for Rabi crops. The rainfall in the district varies from 520 mm in Malshiras tahsil in the west to 778 mm





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Fig. 1-4 B

in North Solapur tahsil in the east. About 74 percent the annual rainfall is received during June to September. The variation in annual rainfall from year to year is large (Fig.1.5). The region therefore, has the problem of inadequate water hampering overall agricultural landscape. In a whole year, there are variations in temperatures, moisture content which affect dairy farming in the district.

# 1.8.4 <u>soils</u> :

Solapur district has mainly emerged out from Deccan trap of volcanic origin. The soils in the district can be classified in five main categories on the basis of depth and structure.

v)	Deep soils	-	More	than 90	cm	depth
iv)	Medium deep soils	-	45.0	to 90.0	cm	depth
iii)	Medium deep soils	-	22.5	to 45.0	cm	depth
ii)	Shallow soils	-	10.0	to 22.5	cm	depth
i)	Very shallow soil		00.0	to 10.0	CIII	depth

It is clear from the fact that of the total cultivated area, very shallow soils occupy about 10 percent, shallow soils 20 percent, medium deep soils 45 percent, and deep soils 25 per cent. In Karmala tahsil about 50 percent area is covered by black soils and remaining by red and light. The soils of Mangalwedha and Sangola are mainly light brown and are shallow. In Akkalkot tahsil, the soils are rich, especially in the vicinity





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of Bhima and Sina river valleys. Madha tahsil has shallow soils having varying depth and quality. Barshi tahsil has an extensive tract of black soils which are productive. In Pandharpur, soil is poor and capable for producing millets. The black soils are confined to Bhima river valley, which are rich for sugarcane production. The district has extensive patches of shallow soils with low water holding capacity and crops in such areas are suffered much during the drought conditions.

## 1.8.5 Water resources :

Water is an important factor, is used for domestic industrial, agricultural purposes. But today, the utilization of water resources in Solapur district is mainly made for agricultural purpose. Inadequate water supply has led to dry farming practices manifesting inferior subsistance farming and poor standard of farmers. This also determines the nature and extent of dairy development. The significance of the water resources in regional economic development hardly needs to be emphasised (Singh and Dhillon, 1984). Surface water is available from the major rivers. The chief river is Bhima with its right bank feeders Nira and Man, and left bank feeders Sina and Bhegawati (Fig.1.2). The drainage area of Bhima within the district includes Western half of Karmala and tahsils of Madha, Pandharpur, Mangalwedha and South Solapur for a distance of 289 kilometers. Nira is another river providing water to the region (Fig.1.2).

The development of underground water sources is essential in drought prone areas like Solapur where it is used widely for irrigation purpose. The wells, in the region, contain small amount of water. The geology of the region, however, is not favourable for digging the wells due to its trap zone.

The underground water is not consistent and it varies from year to year and season to season causing widespread regional imbalances. The watertable should at least remain between 3.5 to 5 meters below the natural surface to be able for profitable irrigation (Singh and Dhillon, 1984).

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