

CHAPTER - II
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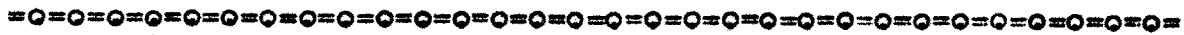
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PROFILE OF THE REGION

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- 2.1 The region
- 2.2 Physiographic characteristics
- 2.3 Soil type
- 2.4 Climate
- 2.5 Water resources
- 2.6 Landuse



2.1 THE REGION :

Miraj tahsil constitutes the southern part of Sangli district in South Maharashtra. The tahsil lies between 16°45' to 17°2' North latitude and 74°10' to 74°48' East longitude which is bounded by Tasgaon tahsil in the north, by Kavathe Mahankal in the east, Walwa tahsil in the west and on the south by Karnataka State (Fig.1.1). The region covers about 926.10 sq.km area with it's eastwest and north-south extension about 85 and 32 kilometer respectively. According to 1981 census, the region had the population of 506,320 staying in 66 inhabited villages and 3 towns. The significant characteristic feature is that the eastern region has poor development of resources. The more population is concentrated in the western part.

The physical environment plays a significant role in determining the development of grape-vine cultivation. In the present chapter the study of physical bases and landuse is attempted.

2.2 PHYSIOGRAPHIC CHARACTERISTICS :

i) Relief :

Relief of an area is one of the primary determinants of the spatial differences in the intensity of agricultural activities. The relief of the land influences landuse, particularly through the elevation, ruggedness and slope. Relief also influences farming by modifying the climate and by affecting

MIRAJ TAHSIL RELIEF AND DRAINAGE

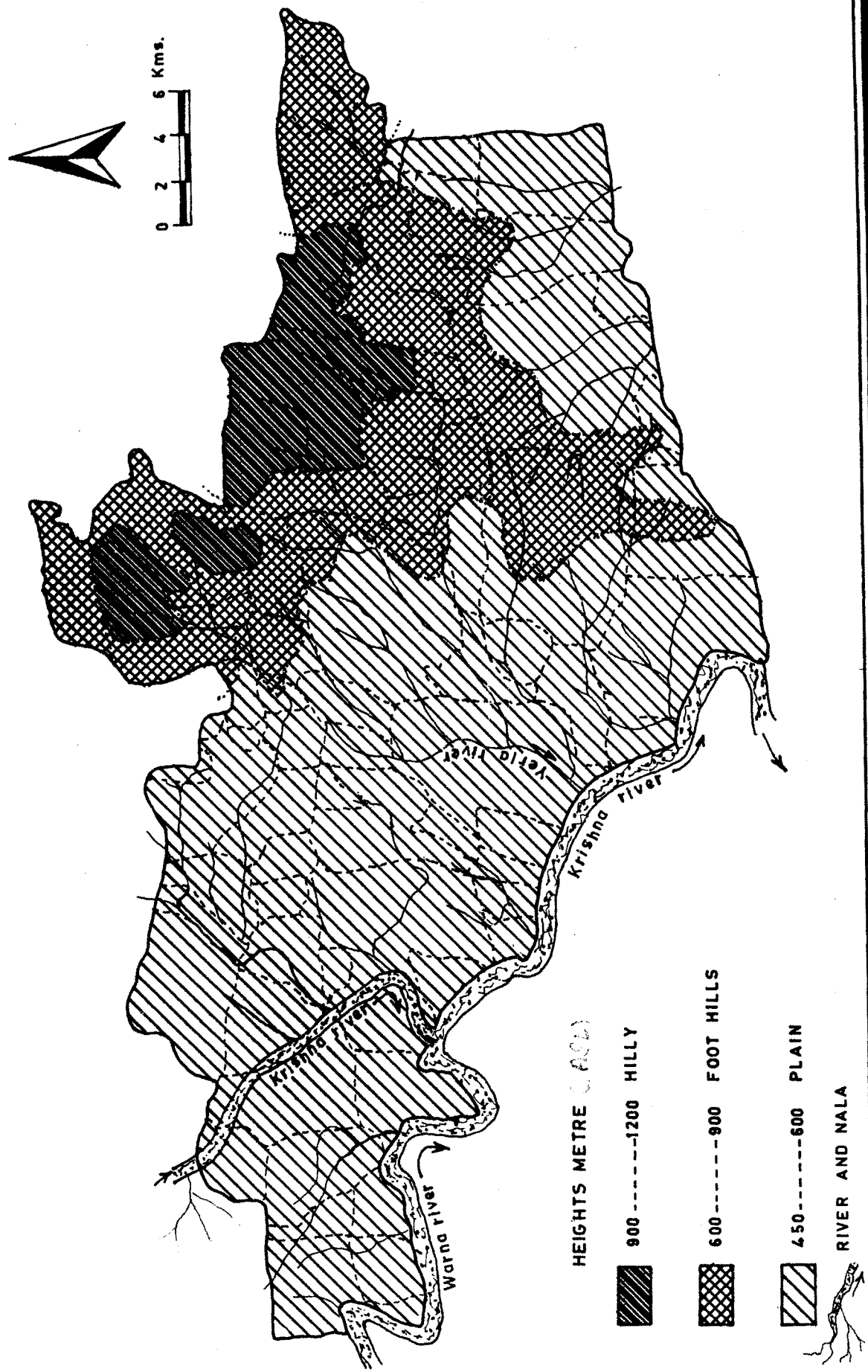


Fig. 2-1

the ease of cultivation (Singh, 1974). The relief of the Miraj tahsil is exhibited in Fig. 1.2^{2.1}. The relief varies from place to place. These variations are due to the geological complexity of the region and varied geomorphological evolution. On the basis of variations in relief features Miraj tahsil can be divided into three relief divisions.

- a) Hill ranges : This division comprises Dandoba range in the north. The major portion of this part lies in the northeast. It is a part of basaltic plateau of Maharashtra and having the characteristics of lava topography. These ranges show intense gully erosion and have a number of sub-branches extended towards the valley. 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.
- b) Foot-hill : This area lies between the hill ranges and plain region of Krishna basin. The altitude ranges from 500 to 900 metre presenting undulated topography. The major portion of this division is observed in the eastern part. The zone is covered with grass land in the north and central north.
- c) Krishna plains : The valleys and small nalas meeting Krishna along with considerable variety of crops in the surrounding regions. Owing to the fertile nature of soils and sufficient water supply, the irrigation facilities are well developed

MIRAJ TAHSIL SOILS

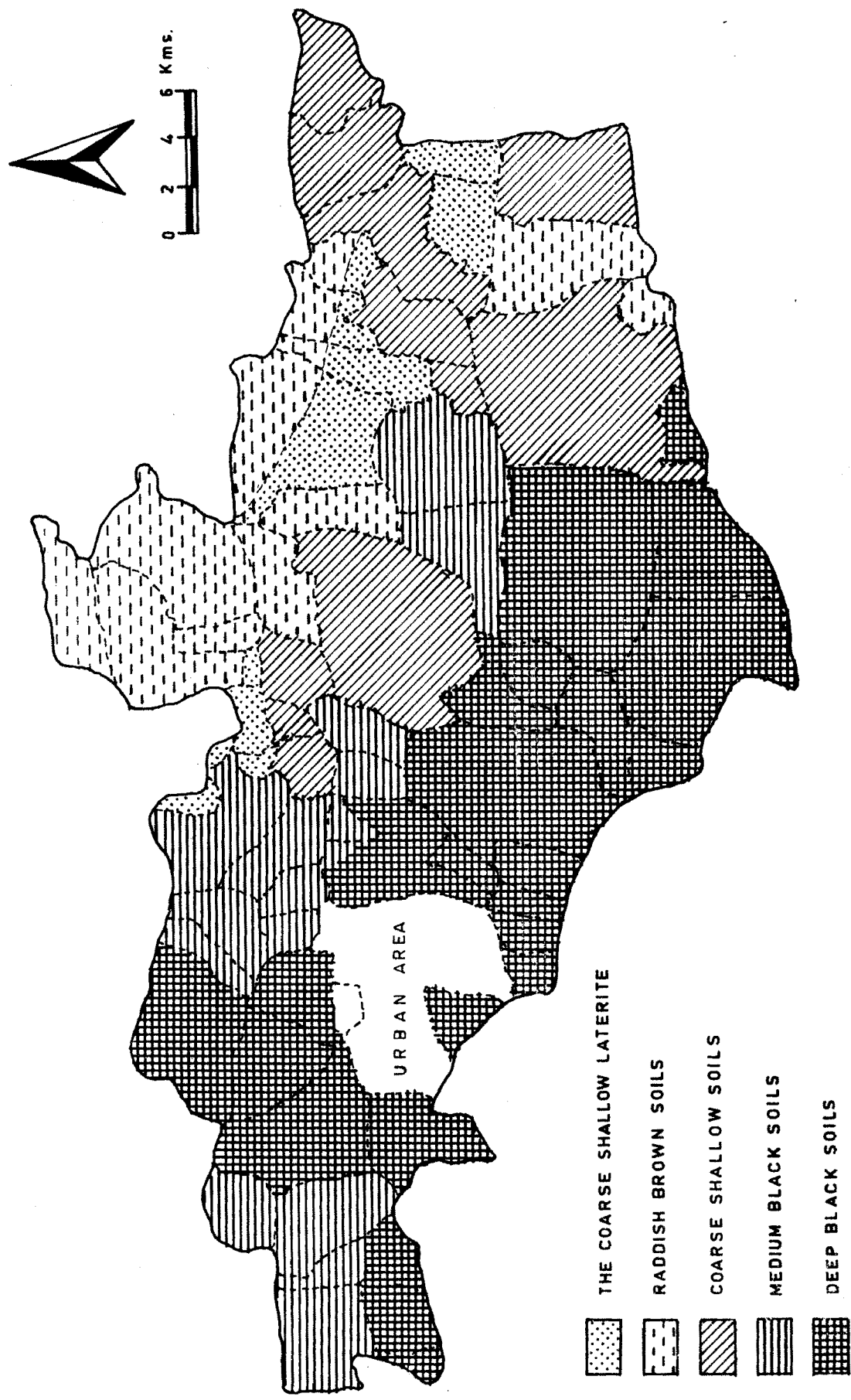


Fig. 2.2

in this western part. This zone is known for sugarcane cultivation but recently grape-vine cultivation is being introduced.

2.3 SOILS :

Soil provides essential material on which agriculture is based and therefore, any comprehensive survey of the geography of agriculture should include a fairly thorough treatment of soils (Singh and Dhillon, 1984). On the basis of different physical characteristics three broad soils zones can be distinguished.

a) The coarse shallow laterite :

The coarse shallow laterite soils occupy a small portion of the north eastern parts, particularly, the hill ranges. These are light brown in colour, covering the area of about 6 villages.

b) Reddish brown soils :

Reddish brown soils are derived from trap topography and are dark brown in colour. They are rich and fertile with excellent granular structure almost neutral in reaction and well supplied with calcium. These soils respond well to the application of fertilizers. These soils are observed in the north central part, particularly on the hilly slopes. These soils are usually unsuitable for cultivation but lowland areas are devoted to jowar, bajara and groundnut. The grape-vine cultivation is practised wherever irrigation facilities are available.

c) Coarse shallow soils :

These are located in the south-eastern and central parts of the region. These are light brown in colour and loamy to sandy in texture having low depth. The nutrient status is low. They are less productive and generally, groundnut, jowar, bajara, wheat, grape are grown in these soils.

d) Medium black soils :

These soils are confined to western and north-eastern parts of the region. These are loamy to clay in texture and are useful for crops like wheat, jowar, sugarcane, chillies etc.

e) Deep black soils :

These soils are found into the flood plains of the rivers Krishna and Warana. They are fairly rich in phosphorous contents and pH values between 7.6 to 8.5. The deep black soils, when irrigated, have shown saline problem affecting crop productivity adversely. Recently grape cultivation is introduced in the shallow black irrigated soils of this zone.

i) Grape Cultivation and Soil Types :

Although grape-vine cultivation is practised in different types of soils it is mostly confined to the medium black and coarse shallow soils of plateau region. Such soils are well drained and suitable for grape cultivation. However, medium black soils in the Krishna river plains are recently devoted for grape cultivation

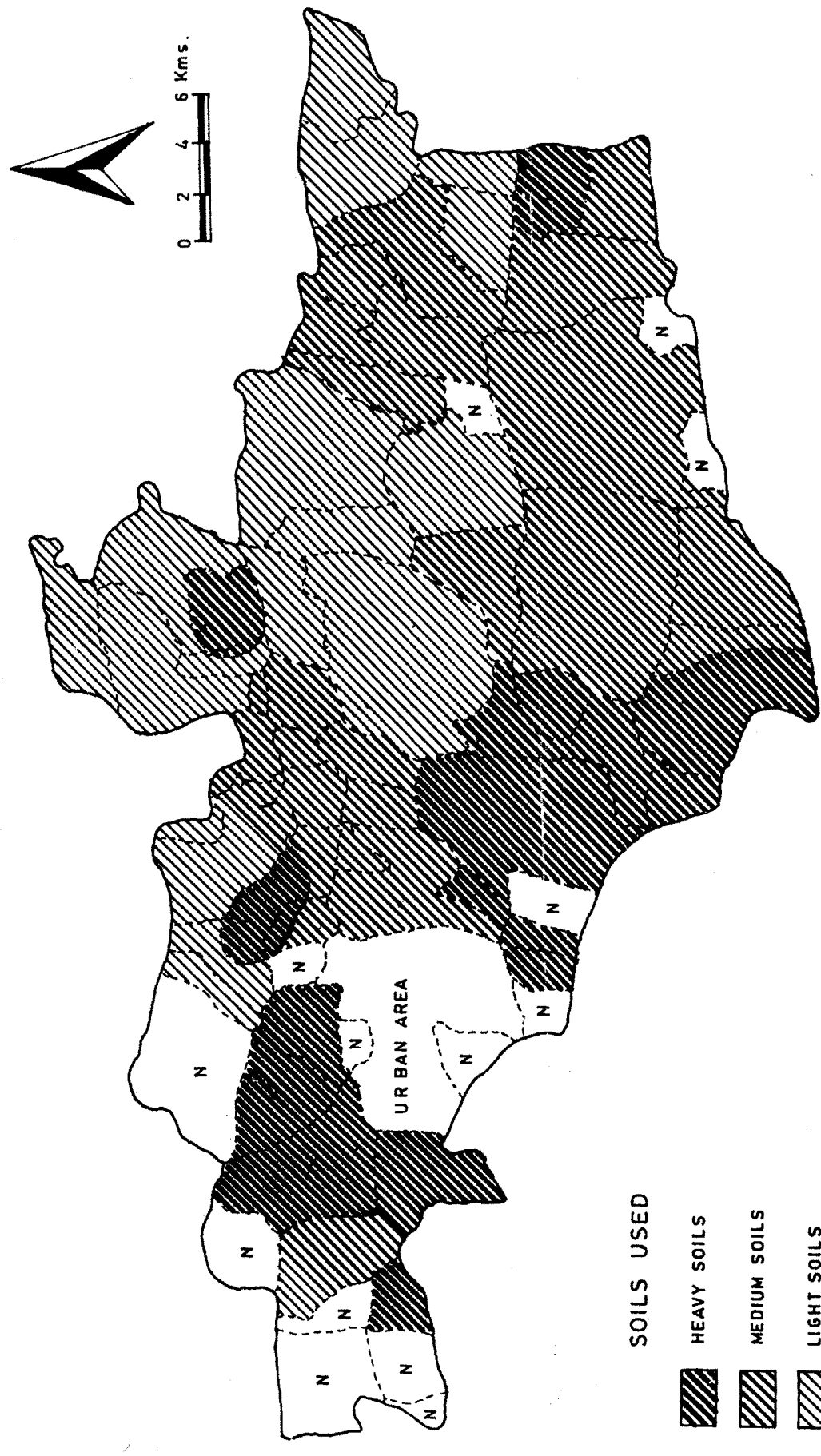
due to their proper drainage. This zone is characterised by assured irrigation mainly from lift schemes. Thus, farmers are turning towards grape cultivation replacing sugarcane on medium black soils. Owing to their natural fertility these soils have proved to be suitable to this crop. Besides, inadequate water supply in east has motivated the shifting of grape cultivation towards the west though soil conditions do not favour much. The reddish brown soils of the east are used for this crop. However, high evaporation due to arid conditions in this part, has led for frequent turns of irrigation which is already inadequate. On the whole, the coarse and brown soils are always suitable for quality production of grapes. Farmers in the southwest apply more manures and heavy doses of fertilizers to soils. Such conditions are also practised in the western part of the region.

ii) Sample Studies of Grape Soils :

Fig. 1.5 exhibits the soil types used for grape-vine cultivation which are based on intensive field survey. The soils are classified into three main categories as i) heavy soils ii) medium soils and iii) light soils.

The heavy soils are used more in the villages of Digraj, Tung, Kavalapur, Sandoli, Nilgi, Dhamni, Mhaisal and Sandoli. The medium soils are used in the south-east, northwest and central parts of the region. It is more useful for the proper growth and production of grape-vine. The villages of Narwad, Bedag, Younko-chiwadi, Belunki, Malgaon, Takali and Miraj possess such soils.

MIRAJ TAHSIL
 TYPE OF SOILS USED FOR GRAPE CULTIVATION
 1986-87



- SOILS USED
- HEAVY SOILS
 - MEDIUM SOILS
 - LIGHT SOILS
 - ABSENCE OF GRAPE CULTIVATION

Fig. 2-3

The light soils are used in the eastern and the north central parts of the region. This tract is hilly and soils are very poor. Since, these soils are well drained the villages of this zone have utilized for grape cultivation wherever irrigation is available. The richness in iron content has led for qualitative grape production.

2.4 CLIMATE :

Climate is one of the important elements of the physical environment affecting agriculture. Climatic conditions are foremost ones because they are difficult to be modified by man (Singh, 1986). Climate can affect the choice of farming system either indirectly through its influence on soil formation or directly through such factors as the length of the growing season, occurrences of frost and due, availability of water for plant growth (Manju Mitra, 1980).

The temperature and rainfall are the two important elements of climate which are considered in the present analysis.

i) Rainfall :

Rainfall is dominant element of all the weather elements and single weather parameter. The average annual rainfall in the region is 625 mm. The present discussion pertains to the annual average distribution of rainfall.

Average Annual Rainfall :

Fig. 2.4 indicates the distribution of average annual rainfall in Miraj tahsil. The annual average varies widely

MIRAJ TAHSIL
AVERAGE ANNUAL RAIN FALL (in mm.)
1960-87

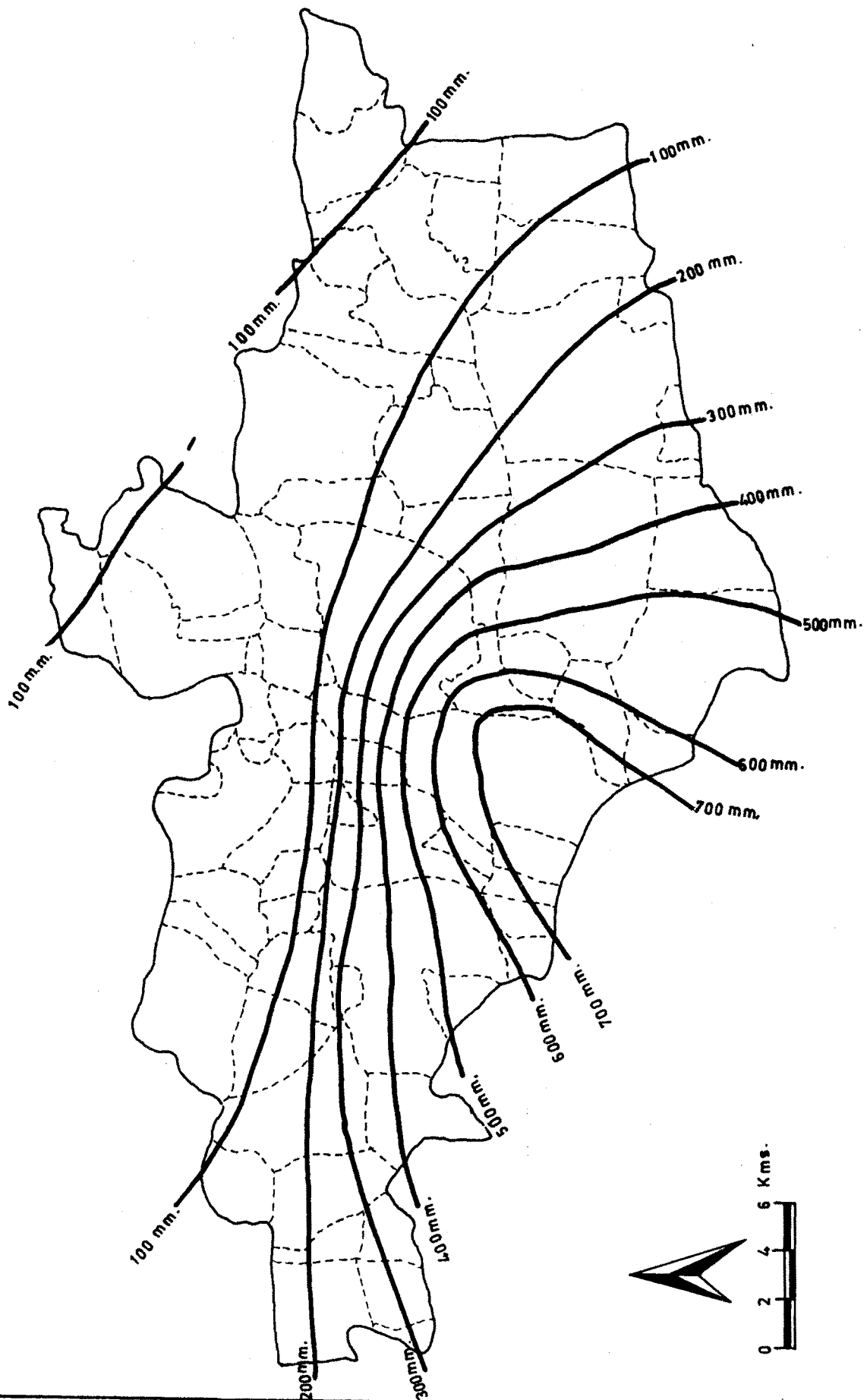


Fig.2.4

from 100 to 700 mm in the region. Generally the isohyets run straight from north^{west} to south^{east}. The region receives rainfall from the southwest as well as northeast monsoon. Sometimes premonsoon rainfall is occurred by thunder storms. The seasonal distribution of rainfall also varies from place to place in the region.

The rainfall is moderate (700 mm) and assured in the western part. The farming becomes possible during rainy season in this part. The rainfall decreases gradually eastwards which is inadequate for crops. Fig. 2.4 shows the rainfall in the different villages. Fig. 2.4 shows variation in rainfall during the period of ¹⁹⁶⁰⁻1987. The entire tahsil records deviation of annual rainfall from the normal.

The seasonal distribution of rainfall reveals that rainfall is highly concentrated in rainy season, which creates scarcity of water during the hot season. The rainfall below 150 mm occurs in eastern parts of the region. Therefore, the grape gardens are less in number in the eastern parts. The general rainfall limits the grape-vine cultivation and general agriculture too.

ii) Temperature :

Being a small region and with only one Meteorological station the temperature data is inadequate for analysis. Therefore, the data is generated through observation.

TABLE 2.1 : Monthly average temperature of Miraj tahsil
1986-87.

Month	January	February	March	April	May	June	July
Temp. °C	33.4	36.8	39.0	40.7	40.0	34.1	32.2

Month	August	September	October	November	December
Temp. °C	30.6	33.0	35.6	29.5	28.0

SOURCE : Collected through field work, 1986-87.

Above table shows that the January, July, August, September, November and December months have recorded low temperatures (below 33.5°C). April and May are the hottest months (40.7°C and 40.1°C). The temperature during rainy months (June to September) are about 26.5°C. The eastern part is hotter than the western part. The high temperatures in the east have led dry conditions which further associated with poor irrigation facilities and low humidity. As such the grape cultivation is hampered considerably.

2.5 WATER RESOURCES :

In the present study an attempt is made to highlight surface and ground water resources in Miraj tahsil.

1) Surface water resources :

Surface water in the form of river streams, springs is also an important source of water in the region. River Krishna

is the premier source of surface ~~of surface~~ water with its small tributaries and streams. But fluctuations of watertable, due to their seasonal nature are observed. In the northern and eastern parts streams are important source of surface water. The streams have sufficient surface flow except February, March, April and May months.

ii) Underground water :

The village level data about different aspects of ground water are not available. But, recently some work is being done by Ground Water Survey and Development Agency, Government of Maharashtra. Therefore, some data have been collected through intensive field work. Ground water occurs in the form of dug wells, wells, springs etc. Various factors like morphological features, drainage pattern, rock structure, joint patterns and texture as well as structural features such as folds and fractures control the occurrence and distribution of ground water (Reddy and Reddy, 1984). There is a very close relationship between rainfall and watertable when rainfall increased naturally the watertable rises and vice-versa.

2.6 LANDUSE :

The use of land constitutes a major item in national planning and this is especially so in India where more than 80% of population depends directly upon the land for their livelihood. Land is necessary for human activities. It provides man with

living space, with food and with a number of raw materials which are used in the satisfaction of his wants. But necessary as the land factor may be man plays an important role in conditioning and transforming his physical environment (Barlowe, R., 1963).

" There are two sets of limits which determine the pattern of landuse in any region. First, the absolute or outer limits which are set by the nature and second, the relative limits set by culture, human attitudes and actions which determine the range of actual and probable use within the limits," (Manjumitra, 1980).

The physical factors, topography, fertility of the soil, sunshine, moisture conditions, temperature and water resources are the most important.

1) General Landuse Pattern :

Landuse pattern is invariably determined by physico-socio-economic and organizational factors. It represents the use of region's natural resources. It is a dynamic phenomenon as it changes with the introduction of new technology. Such type of study may help in understanding the regional variations which correspond with the development of grape-vine cultivation.

The total geographical area of the region is 97,058 hectare of which forest cover 0.05 percent area. Due to less rainfall the forest land is less in the eastern part. The other categories of landuse like area not available for cultivation, cultivable waste,

fallow land, pasture land share only 20.92% of the total. The first ranking category is net area sown (79.03%). In the western part higher percent of land is under this category whereas it is low in the eastern and northern parts of the region.

TABLE 2.2 : General landuse pattern in Miraj Tahsil, 1986-87.

Sr. No.	Landuse category	Area in hect.	Percentage to total area
1	Forest	53	0.05
2	Area not available for cultivation	5,332	5.50
3	Cultivable waste	5,373	5.53
4	Fallow	4,700	4.85
5	Pastures	4,900	5.04
6	Net area sown	76,700	79.03
Total		97,058	100.00

SOURCE : Tahsil Office, Miraj, 1986-87.

ii) Cropping Pattern :

In the region overall cropping pattern has been dominated by food crops occupying about 59,347 hectares (77.46%). Jowar is the leading crop (28.68%) followed by sugarcane (10.92%). Other foodgrains occupy very small proportion of the area (Table 2.3).

**TABLE 2.3 : Area under different crops in Miraj Tahsil,
1986-87.**

Sr. No.	Crop	Area in hect.	Percentage to net sown area
1	Jowar	21,964	28.68
2	Rice	1,532	2.00
3	Maize	729	0.96
4	Wheat	2,484	3.24
5	Bajara	1,294	1.68
6	Misc.crops	31,344	40.91
7	Sugarcane	8,369	10.92
8	Groundnut	7,377	9.63
9	Fruits and vegetables	910	1.18
10	Cotton	265	0.35
11	Turmeric	340	0.45
Total		76,608	100.00

SOURCE : Panchayat Samiti, Miraj, 1987.

But sugarcane has now attained significant position i.e. 8,369 hectares of cultivated area (10.92%). Miscellaneous crops have also occupied significant area (40.91%) whereas groundnut has acquired 7,377 hectare (9.63% area). The fruits and vegetables have also marked the position with 910 hect. (1.18%) out of which 565 hect. have been occupied by grape-vine cultivation in Miraj

tahsil. Owing to it's high economic returns this crop has affected the region's economy favourably. On the whole, the cropping pattern is dominated by foodgrains. Table 1.3 reveals cropwise area in the region.

The irrigated crops like sugarcane, wheat, maize, fruits and vegetables etc. are notable. Of these sugarcane is dominant crop in the west covering about 13.16% of the total irrigated area.