CHAPTER - II

PROFILE OF THE REGION

2.1 INTRODUCTION

Water harvesting is the activity of direct collecting of rain water. The rainwater then collected can be stored for direct use or can be recharged in to groundwater. Rain is the first source of water. Rainwater harvesting measures are closely related to physical environment, particularly relief, climate and soil. The present chapter therefore, is devoted to the analysis of the pysio-socio economic profile which forms background against which rainwater harvesting development takes place.

2.2 PYSIOGRAPHIC PROFILE

The physical bases, particularly, the relief, drainage, geology, climate and soil play vital role in shaping the rainwater harvesting.

2.2.1 RELIEF

Phaltan tahsil presents varied physical features and based on the relief features it can conveniently be divided in to : (Fig.2.1&2.2)

a) Hilly region (above 900mtrs)

b) Rolling or transitional zone (600 to 900mtrs)

c) Level plain (below 600mtrs)

a) Hilly Region (Above 900mtrs)

The hilly region occupies smaller part sharing 10 percent (118.05sq.km) of the tahsil is area in the southern it is the part of Mahadeo ranges having more than 900 mtrs elevation (Fig.2.1). In this part various ranges and ghats are involved namely, Tathavada ghat in south west part of tahsil, Shitabai Dongar in southern part, Varugad and Shikhar Shingnapur hills in south east part and Mograla ghat situated in the eastern part of Phaltan tahsil. The moderate to steep slopes are observed from south to northward. These slopes provide high potentials for rainwater harvesting.(Fig.2.2).

PHALTAN TAHSIL : RELIEF

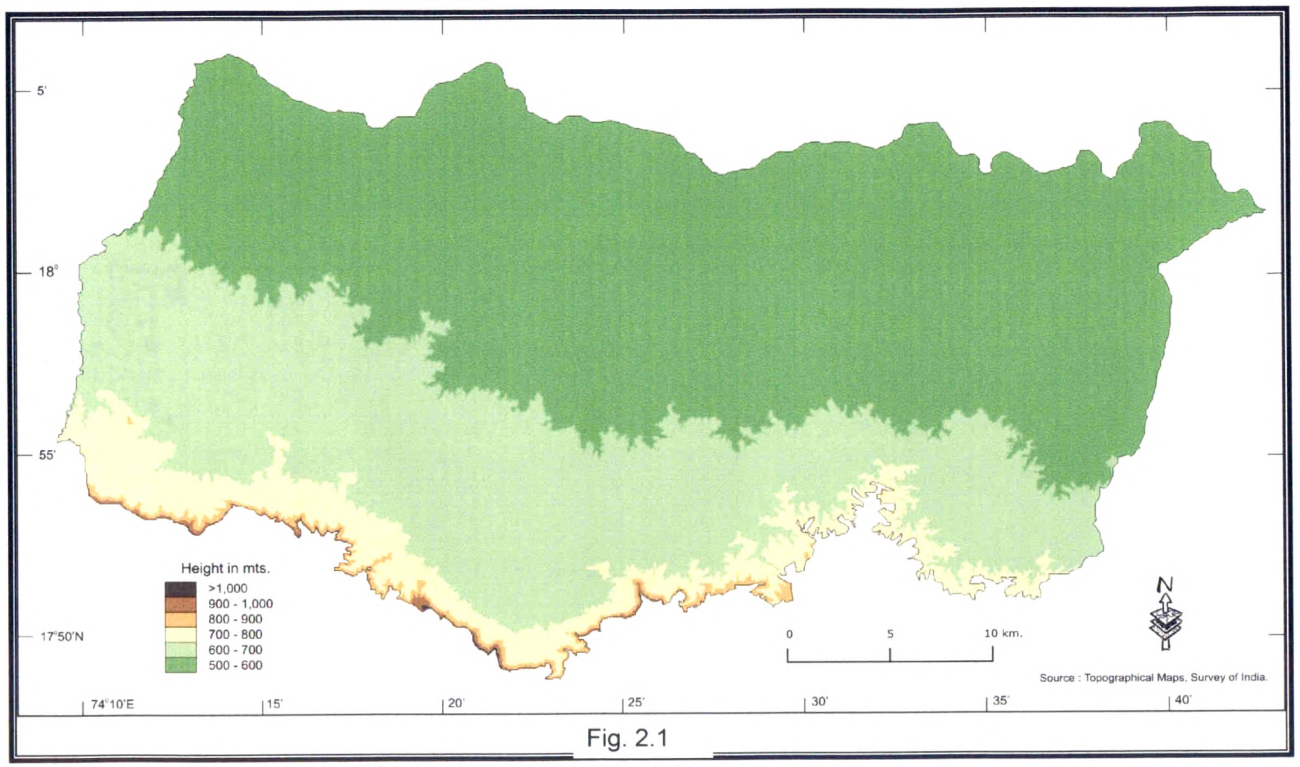


Fig. 2.1

PHALTAN TAHSIL : 3D VIEW SHOWING THE RELIEF & DRAINAGE PATTERN (USE GIS SOFTWARE)

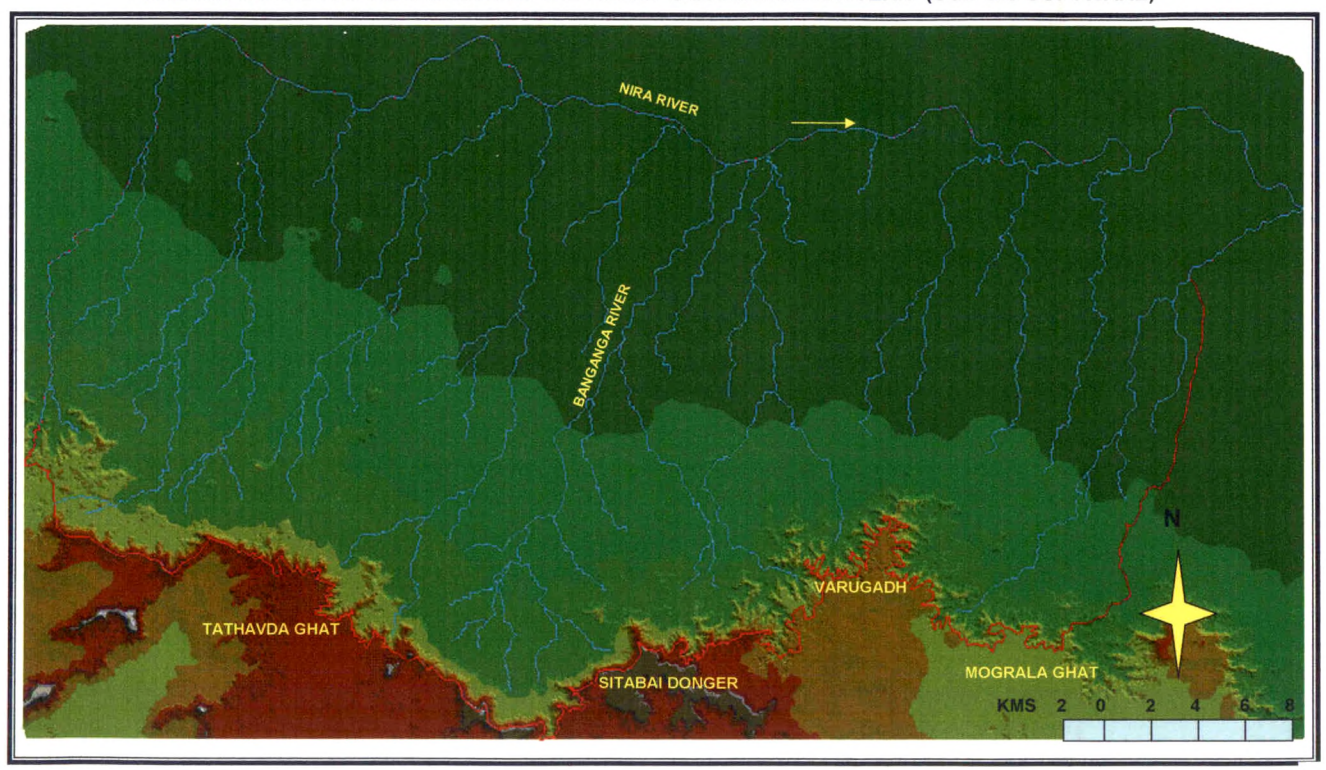


Fig.2.2

Source : Topographical Maps, Survey of India

b) Rolling or transitional zone (600 to 900 mtrs.)

Towards the north of hilly zone, parallel to Nira river transitional belt has been characterized by various minor land forms. It occupies 413.18 sq. k. m. (35%) area. This zone is also suitable for rainwater harvesting measures.

c) Level plain (below 600mtrs)

Level plain an extensive zone with 649.18 sq k. m. (55%) area is mainly confined to the northern border and parallel to Nira River. It has been widened towards the east having fertile soil cover and availability of perennial water supply from right bank Nira canal. This zone is less suitable for rainwater harvesting.

2.2.2 DRAINAGE

The physical setting of Phaltan Tasil a contrast of immense dimensions reveals a variety of landscapes. The variation in the relief of Phaltan tahsil has influenced the drainage pattern also. Only important river Nira is the main tributary of Bhima a main left bank feeder of river Krishna.

Nira rises in the Sahyadri range near Bhor in Poona district and from there it runs eastward to form the boundary between Pune and Satara district. The river has acquired great economic importance due to the Bhatghar and Vir dams from which Nira right bank and left bank canals supply water to Phaltan and Khandala tahsil's.

River Banganga is one of the feeders of river Nira. The Banganga raises in the Sitabai hills in Man tahsil having the total length of 50 kms. The river runs south- eastward to the villages Girvi, Dhumalwadi, Velosi. The riverbed is sandy and the banks are highly eroded. This river joins river Nira at Somanthali village of Phaltan tahsil. Besides, there are many smalls' streams draining the entire region following towards north. These

PHALTAN TAHSIL : DRAINAGE PATTERN

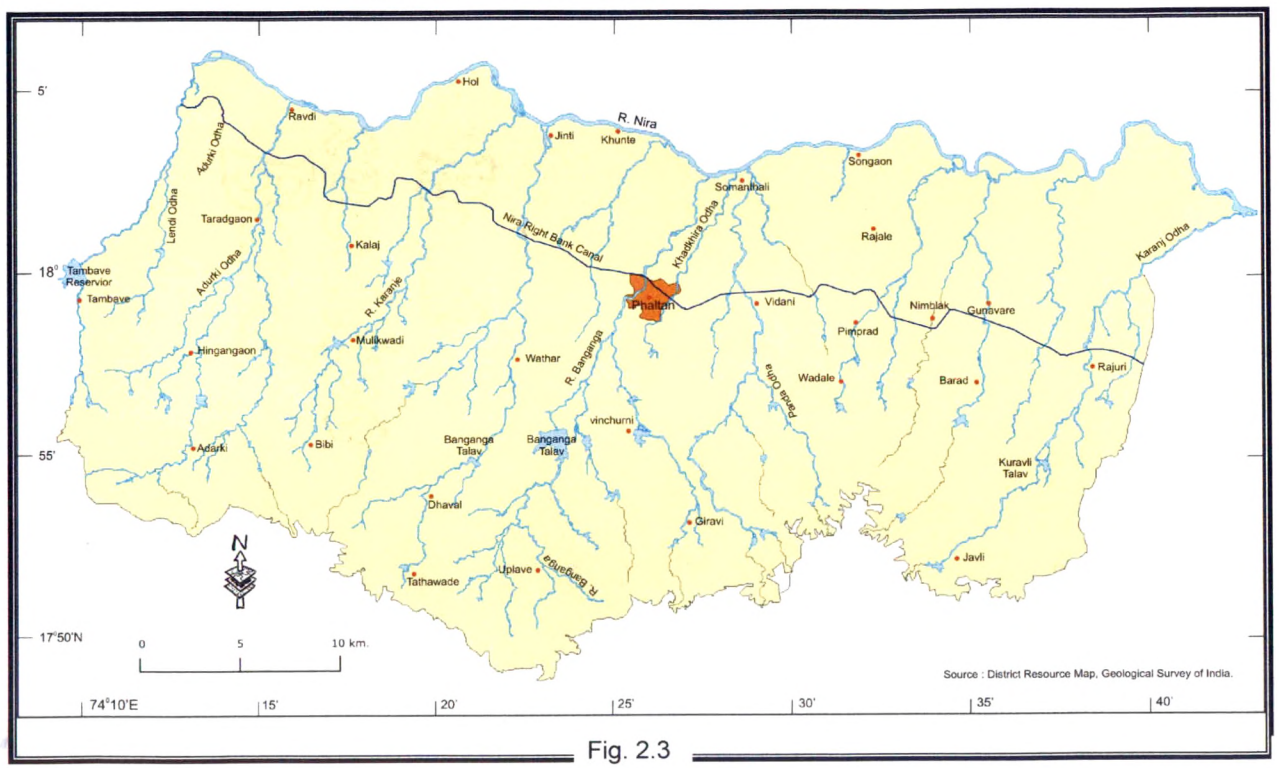


Fig. 2.3

streams have provided the potentials sights for implementing various measures for rainwater harvesting. (Fig. 2.3)

2.2.3. SOILS

There are four groups of soils in the region and their distribution corresponds with the relief features. Since it is the part of Deccan trap the black soils are extensively observed (113,356 hect). However they vary in their depth and according to subtypes they are considered here. The deep black (above 100 cm) soils are close to the river course which are fertile and devoted mainly for sugarcane crops. This has been followed by medium black soils (50 to 100 cm) with 32,873.24 hectares areas. The shallow black (25 to 50 cm) soils transitional zone has less intensity of irrigation. Jawar and Bajara are the to major food crops. Laterite soils are observed in the extreme south, which is poor in nature creating obstacle in development of agriculture. (Fig. 2.4).

2.3. CLIMATE

Climate is one of the principle factors of physical environment affecting agriculture, irrigation & water management programmes. Climatic conditions are important in determining distribution and performance of crops. Monsoon affects or even dominates almost every aspect of our life (Spate and Learmouth, 1967). The temperature and rainfall being two important elements of climate have been considered in the present analysis. The nature of distribution of these elements determines the necessity of rainwater harvesting as the region falls in drought prone area of Maharashtra.

2.3.1 TEMPERATURE

Temperature can be regarded as an important component, which indirectly controls rainfall regime and water availability for water harvesting. The temperatures recorded at Phaltan tahsil headquarter are considered here.

PHALTAN TAHSIL : SOILS

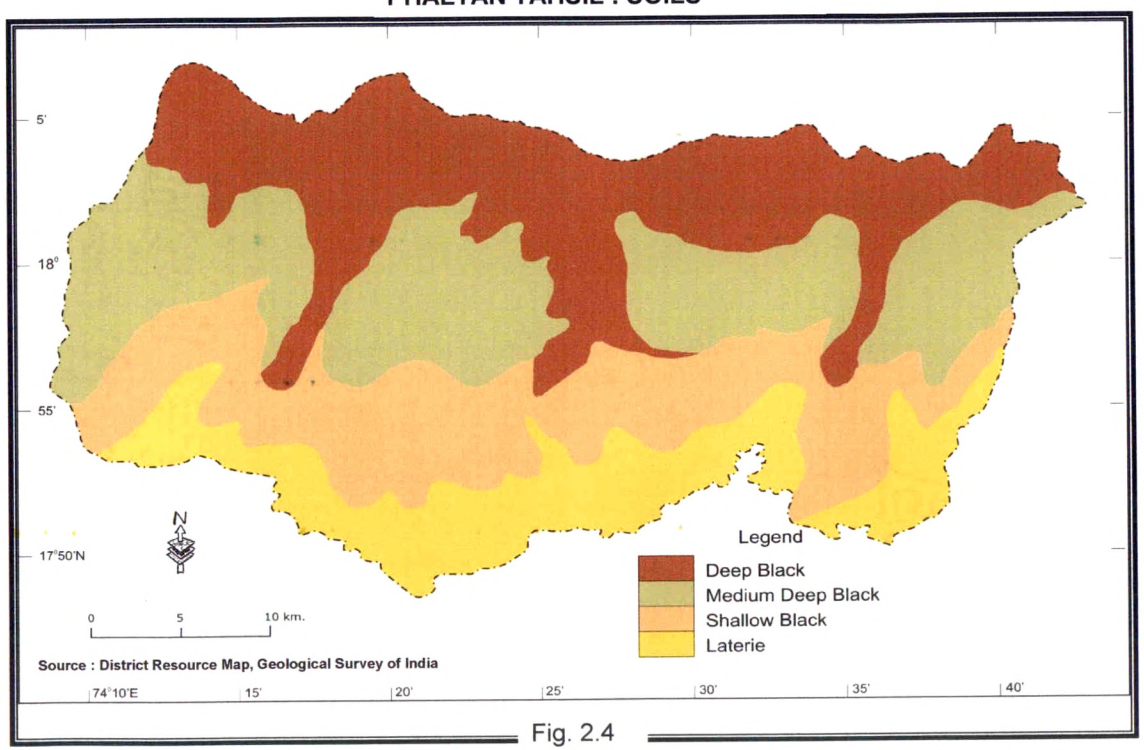
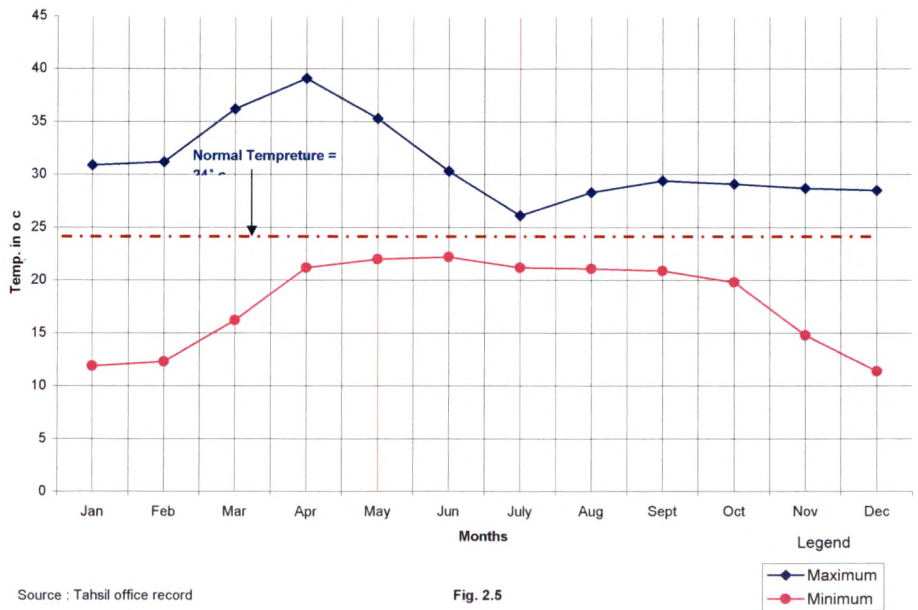


Fig. 2.4

PHALTAN :
MONTH WISE MAXIMUM & MINIMUM TEMPERATURE (2006)



Source : Tahsil office record

Fig. 2.5

Fig. 2.5 shows monthly average temperature (Year 2006) which varies from month to month. December, January and February are months having low temperatures (< 20.5°c). High temperatures (> 32°c) are observed from April onward up to June. The high temperature in summer season enhances the rate of evaporation of water.

2.3.2 RAINFALL PATTERN

The seasonal nature and intensity of rainfall are important considerations, which determine water regime and consequently the development of rainwater harvesting programme. Semi- arid areas with an annual rainfall in the range of 400 to 750 mm having rolling terrain including a hard plateau region can benefit from the water harvesting techniques (Bansil, 1998). For the present investigation 20 years rainfall pattern have been considered. The average annual rainfall in the region is 460 mm. which declines west to east. (Fig.2.6)

a) Spatial distribution of rainfall

It is observed that the average annual rainfall of the region is 460 mm. However, the rainfall decreases from west to east (600 to 500 mm). Despite spatiotemporal variation, the monsoon rainfall has created temporal variations as below:

b) Seasonal distribution of rainfall

The necessity of rainfall arises when the distribution of rainfall is uneven in time and space as the crops require timely and adequate water supply. Table 2.1 & 2.2 shows seasonal distribution of rainfall in 2005. It is evident that the rainy season has been characterized by relatively high rainfall. The high proportion of rainfalls is observed in the month of June (263.40 mm). In hot summer season (Mar to May) the region has moderate rainfall (85.40mm). The months of October and November (Post-monsoon) have also recorded 42 mm, rainfall that is useful for rabbi season. Nearly 82.66 percent rainfall occurs in rainy season.

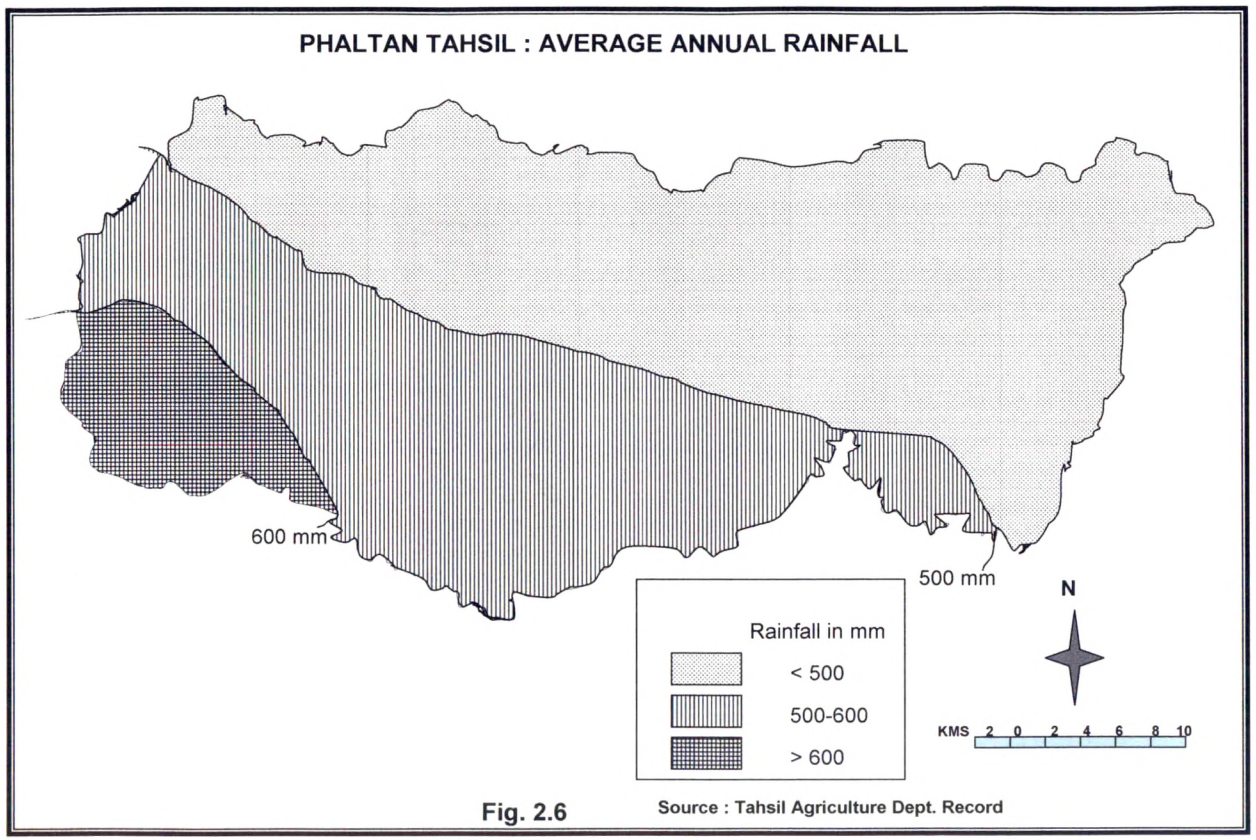


Fig. 2.6 Source : Tahsil Agriculture Dept. Record

Table no. 2.1

PHALTAN RAINFALL STATION : MONTH WISE RAINFALL DISTRIBUTION (2005)

Months	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Total Rainfall in mm	00 -	00 -	00 -	00 -	85.40 (11.65)	263.40 (35.93)	47.00 (6.41)	64.60 (8.81)	231.00 (31.51)	27.00 (3.68)	15.00 (2.01)	00 -

Not : Figures in bracket indicate percentage of total rainfall

Table no. 2.2

PHALTAN RAINFALL STATION : SESONAL RAINFALL DISTRIBUTION (2005)		
June to Sept	(Rainy Season)	82.66 %
Oct to Nov	(Post-Monsoon Season)	5.69 %
Dec to Feb	(Winter Season)	0 %
Mar to May	(Hot Summer Season)	11.65 %

Source : Tahsil Agriculture Dept.

In view of the distribution of rainfall, the year can conveniently be divided into four seasons.

i) Rainy season (June to September)

The rainfall is highly concentrated in this season as it receives about 82.66 present of total annual rainfall (Table 2.2). Although, it is mostly un-assured; it is very much useful for kharif crops. The intensity of rainfall during this season is important in the context of water availability for rainwater harvesting.

ii) Post- monsoon season (October to November)

Climatically this period is transitional. The south- east monsoon is associated with cyclonic rainfall. The region receives 5.69 percent of total rainfall and it is useful for rabi crops.

iii) Winter season (December to February)

The region receives almost no rainfall in this period. Sometimes it is characterized by the irregular cyclonic rainfall which is beneficial, though not adequate for rabi crops.

iv) Hot summer season (March to May)

This part of the year receives insignificant amount of rainfall (11.65 %) This is associated with thunderstorms. It is very useful for harvesting and conserving rainwater in water deficit period of March to May.

c) Annual variations in monsoon rainfall & rainy days

Fig. 2.8 indicates annual deviation in rainy days from the normal for the last 20 years. The region has observed about 437.66 mm normal rainfall. The annual average rainfall has observed more than the normal for seven years (Fig.2.7). The year 1998, has recorded highest rainfall. (1017mm) and rainy days (58). Contrasting to this, there are some years which are marked by rainfall less than normal. Nearly 17years have

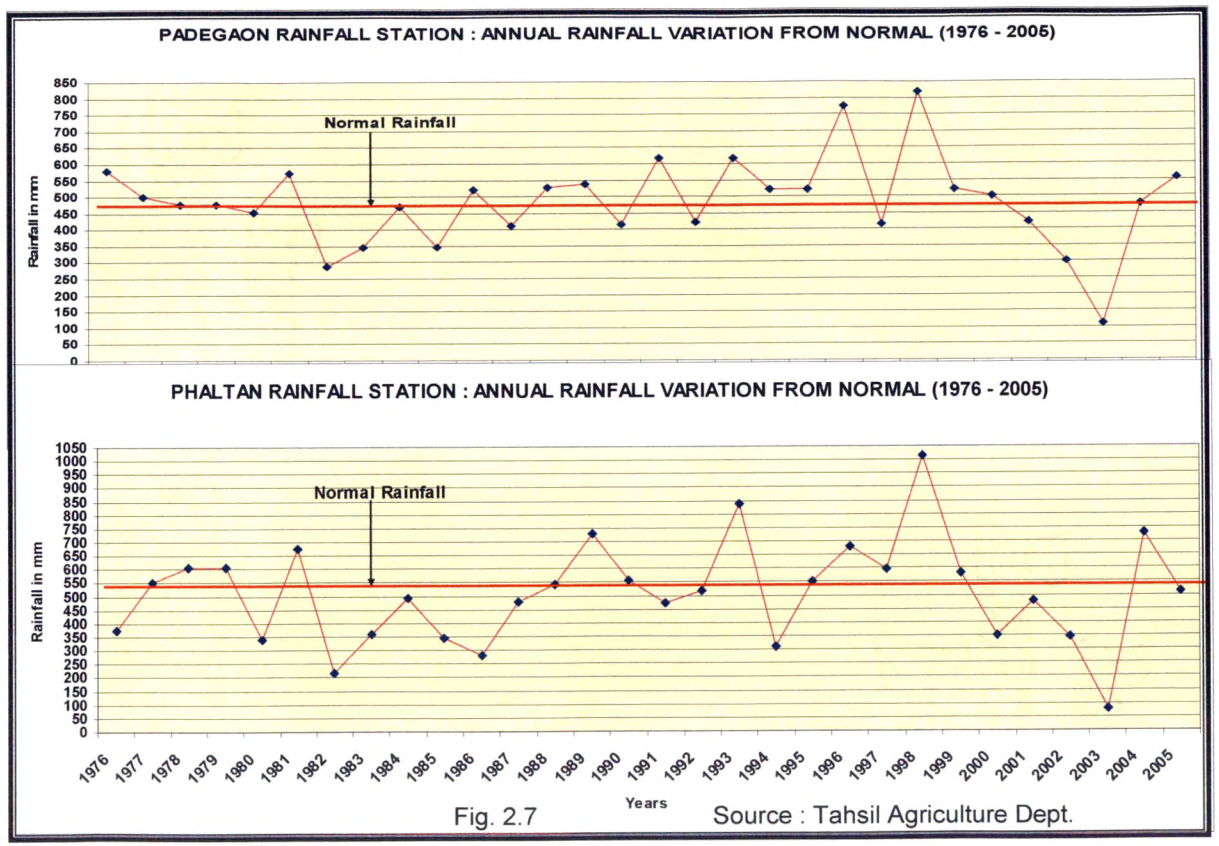
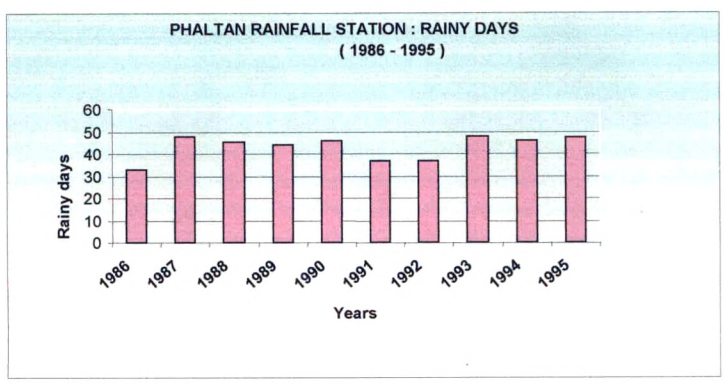
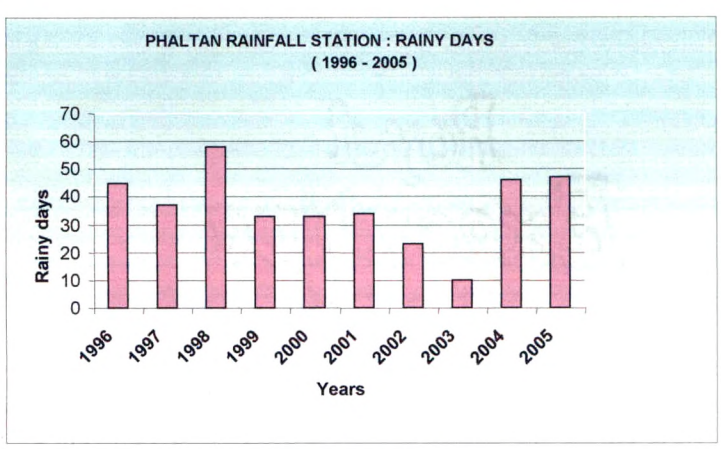


Fig. 2.7 Source : Tahsil Agriculture Dept.





Source: Tahsil Record

Fig. 2.8

recorded this situation and the year 2003 marked lowest rainfall (81 mm) and lowest rainy day (only 10 days).(Fig.2.8) Remaining years have recorded normal rainfall. All these temporal variations have close link with the availability of water. The said analysis reveals the there is dire need of water harvesting in the region.

d) Rainfall Intensity and Variability

The term intensity is used here in the context of rainfall received during 24 hours period. It is important to determine the intensity of soil erosion by rain and the usefulness of rain. Moreover, the intensity of rainfall determines the water regime and thereby water harvesting potentials of the region. The intensity of rainfall (I) is calculated by employing the formula, I = A/n, propounded by Monkhouse and Wilkinson (1971), where 'A' is the total rainfall over a given period of time and 'n' is the total number of hours of rain or rainy days. The intensity of rainfall thus calculated varies from 14 to 18 mm per rainy day in the south western part (Adarki & Hole revinue circle) of Phaltan tahsil. On the contrary, the central and eastern parts have less than 15 mm intensity and falls in rain-shadow zone. The rainfall variability also increases from west to east from 25% to 30% (Shinde, 2002).

2.4. GEOMORPHOLOGY

The relief features and the soils of the region are essentially the products of the geological formation of the region. Accordingly, the thasil belongs to Deccan traps and located at the western limits of it. Enormous lava flows which poured out through fissures and localized vents during upper Cretaceous to lower Eocene period. Because of their spreading over greater parts of peninsular India (Deccan) and because of their step like terraced appearance (Trap) they are called Deccan Traps. (Fig. 2.9)

PHALTAN TAHSIL : GEOMORPHOLOGY

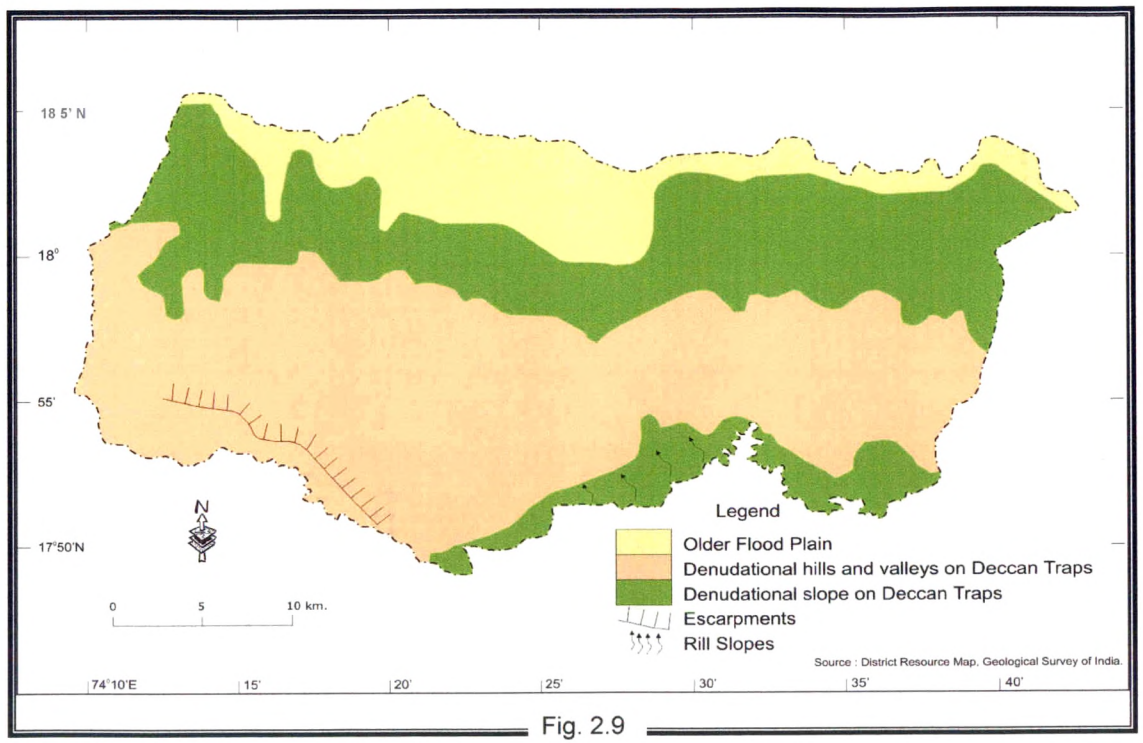


Fig. 2.9

They are dominantly having basaltic composition (Desai, 1971). These lava flows formed the plains with a soil of varied thickness.

The denudation slope on deccan traps attain their maximum thickness near Tathavda, & shikhar shingnapur, which are the sub ranges of Western Ghats. Due to the trap weathering, there is vast concentration of grayish material and junctions keep contouring bat at several places along the slope of the hills the cut across the contours (Kulkarni, 1973).

2.5 THE GENERAL LANDUSE PATTERN

Land use is a geographical concept since it involves specific areas. The land use studies in its spatial context, is essential to understand the regional zonetion of areas of optima land use degraded areas etc. (shinde, et.al, 1987). The utilization of land for different purposes indicates an intimate relationship between prevailing ecological condition and man. Land use in general and cropping of irrigation besides the other such as soil, climate and other agro input. Hence an account of irrigation facilities is taken.

2.5.1 FACILITY OF IRRIGATION

Irrigation is regarded as an integral part of sound infrastructure and is one of the basic ingredients of agricultural activities. It transforms the subsistence agriculture landscape gradually in to commercial one making agriculture economy market oriented (Pawar, 1989). Hence due weightage is given for irrigation in the following paragraphs.

The source of irrigation in the study region are largely affected by the physical features such as topography, geology, soils, presence of ground water and climatic conditions etc. Presently the region has three different sources of irrigation viz. well, canal and tank. The different modes of irrigation are characterized by the change in their ranking order.

Consequently, the wells rank first (60.58 percent,) followed by canal (32.77%) and tanks (6.65%) during 2004-05 (Table 2.3). Such hierarchical position has existing during 1984-85. The well irrigation is dominant in the tahsil occupying about 60.58 percent of irrigation area. This may be due to percolation from the Nira Right Bank Canal system and water percolating tanks as well. There are over 9074 working wells in the study region, an about 10080 bore wells (2005).

Table 2.3
PHALTAN TAHSIL: AREA UNDER DIFFERENT SOURCES OF IRRIGATION
(1984-85 & 2004-05)

(Area in hectares)

Sr. No.	Source of irrigation	1984-85	2004-05	Absolute increase (hect.)	% change 1984 -85 to 2004-05
1	Wells	24580.38 (59.34)	41629.84 (60.58)	17049.46	+ 1.24
2	Canals	14755.30 (35.62)	22520.53 (32.77)	7765.23	- 2.85
3	Tanks	2086.84 (5.04)	4566.37 (6.65)	2479.53	+ 1.61
4	Total	41422.52	68716.74	27294.22	+ 2.85 -

Note : Figures in bracket indicate percentages to total irrigation area.

Source : Computed by the researcher, (2006), based on data collected from tahsil office Phaltan.

2.5.2 GENERAL LAND USE

It is the use made of land by man in a series of recognized categories and it is the function of four variables viz. land, water, air and man (Singh, 1998). Certain proportion of it is available for cultivation which is the base for agricultural production. Land use changes occur to meet the varied demands of the society in its new way of life.

The major use of land is for crops, forest, pasture, mining, transportation, gardening, residential, recreations, industries, commercial purpose, cultivable waste, barren and fallow land. The land use study, in its spatial context, is essential to understand the regional nature of the areas of optimum land use, degraded areas etc. (Shinde, 1981).

Table 2.4

PHALTAN TAHSIL: LAND USE PATTERN (1984 - 85 & 2004 -05)

Land use category	Area in Hect. 1984-85 (Average)	Percentage To total geographical area	Area in Hect. 2004-05 (Average)	Percentage	Change in 1984 to 2005
I . Non-cultivated land					
1 Forest	7.42	8,893	2.89	- 4.53	
2 Area not available for cultivation	21,710	8.50	13,187	4.29	- 4.29
a) Land put to non agricultural use	25,102	0.02	40	0.01	- 0.01
b) Barren & uncultivable land	52	8.56	13,147	4.28	- 4.28
	25,050				
II . Cultivated land					
3 Net area sown	203,123	69.38	263,132	85.50	+ 16.12
4 Fallow land	38,455	13.13	6,410	2.08	- 11.05
a) Current fallow	34,455	11.77	3,259	1.05	- 10.72
b) Other fallow	4,278	1.36	3,151	1.03	- 0.33
5 Other cultivated land		1.49	16,128	5.24	+ 3.75
a) Uncultivable waste land	4,390	0.33	8,985	2.92	+ 2.59
b) Permanent pasture land	1,155	1.16	7,143	2.32	+ 1.16
	3,235				
Total Geographical area	**302,780**	**100.00**	**307,750**	**100.00**	**+ 19.87 -**

Source : i) Socio-Economic Review and District Statistical Abstracts of Satara District.(2006) ii)Compiled by the Researcher

The study has been made under two heads viz. a) Non cultivable land and b) cultivable land (Table 2.4).

a) Non-cultivable land:

The non-cultivated land comprises forestland and area not available for cultivation. Forest occupies about 2.89 percent (8893 hect.) of total geographical area in 2004-05, which was about 7.42 percent (21710 hect.) in 1984-85. The forest area is mainly confined to western and south western parts of the study area. Area not available for cultivation is about 4.29 percent (13187 hect.) which includes land which cannot be brought under cultivation unless at a heavy cost. The land put to non-agricultural use is 0.01 percent (40 hect.) of the total area of Phlatan tahsil. (Table 2.4)

b) Cultivable land:

The cultivable land, which includes the net sown area and fallow land sharing about 85.50 percent of geographical area. The high (above 90%) proportion of this category is observed in Hole, Phaltan and Aussu circles. Generally, this is due to the gentle slope and recent developments in irrigation facilities. Taradgaon, Barad and Girvi circles have moderate (60-90%) area under this category. The low (below 50%) intensity of net sown area is observed in Adarki circles where the land is highly rugged resulting in poor scope for agriculture.

The land which remains vacant for 5 to 7 crop seasons comes under fallow class. The total fallow land accounts for 2.08 percent (6410 hect.). Of this 1.05 percent (3259 hect.) is other fallow land (Table 2.4).

The other uncultivable land consists of cultivable waste and permanent pasture. Total area under this land use category is 5.24

percent (16128 hect.). Of this 2.92 percent (8985 hect.) is uncultivable waste land and 2.32 percent (7143 hect.) is permanent pasture.

Table 2.4 reveals that there are some changes in general land use. The area under forest has decreased by 4.53 percent. The negative change is also observed in case of the area not available for cultivation (4.29%). Whereas other uncultivable land records positive change by 3.75 percent. The region has noted decrease (11.05%) in fallow land during 1984-85 to 2004-05. This can be well attributed to increase in net sown area (16.12%) due to increase in irrigation facilities in the study area (Table 2.1).

2.6 NEED FOR WATER HARVESTING.

The spatio- temporal distribution of rainfall in the region is very uneven. There is fair concentration of rainfall in the rainy season but still the region experiences dry spells considerably. Rainfall variability also exceeds 25% in the region. The dry months are characterized by acute shortage of water for drinking & crops as they receive insignificant amount of rainfall. In summer season many villages face the problem of the drinking water. This has created the need of rain water harvesting in the affected villages and in Phaltan city. Therefore, the region has no alternative to harvest and conserve the rainfall water within the ponds, dams, cement tanks and regulating it when it is required for agriculture, industries & domestic use.

2.6.1 THE MOST VISIBLE PROBLEMS

The water problem is largely related to inadequate replenishable fresh water supply a skewed regional distribution largely because of inadequate rainfall, growing demand of water for various uses, and finally inefficient management. The study region suffers the problems of water

shortage mainly in the month of April and May. Following are some of the most visible problems observed in phaltan tahsil.

*i) **Famines condition: -***

The foregoing discussion about the variability of rainfall shows that in the eastern and northern part of the region. Rainfall reliability is un-assured of rainfall. The fact finding committee appointed by the Government of Maharashtra in 1973 under the chairmanship of S. R. Sukhatankar had reported that in Phaltan, Khatav and Koregaon tahsils in Satara district, the frequency of Famines are once in every ten years.

Phaltan is a chronically sub drought prone tahsil in Satara district. The tahsil generally faces the drought situation due to the geographical condition. It falls in rain shadow zone. In last 50 years there has been 10 years having drought and scarcity conditions. In these years the drinking water is provided by water tankers.

*ii) **Over exploitation of ground water resources:***

Inadequacy of surface water leads to over exploitation of groundwater and the over exploitation of ground water leads to fall of water level causing failure of the well and tube well or deepening of the structure results in higher cost of pumping. Day by day over drilling of ground water is increasing fastly resulting in depleting of ground water level.

Conjunctive use of surface and ground water resources involves their development in such a manner that during a year or any other period, shortage of one could be supplemented from an excess of the other for instance, ground water resources could be utilized during the dry season and the depleted amount would be replenished by recharge during the subsequent wet season. Activating the conjunctive use of surface and ground water resources is an urgent need for over exploited areas in the study region such as Girvi & Barad circles. In canal irrigated

areas such as Taradgaon circle & Phaltan circle it is now felt essential to develop shallow tube well and potential ground water should be utilized through proper scientific water management practices. These practices will not only lower the water table in canal-irrigated areas but also minimize the soil salinity and other environmental hazards.

Now days the concept of rainwater harvesting in urban and rural areas to recharge the ground water has assumed importance and has been accorded highest priority by Government Rooftop rainwater harvesting.

2.7 DEMOGRAPHIC PROFILE

Population is the point of reference from which all the other elements are observed and from which they all are collectively, derive significance and meaning (Triwartha, 1970). The growths in population and expansion of economic activities have led to increasing demand for water for diverse purposes. (Gujar & Shukla, 1998). Simultaneously the literary structures also affect the adoption of any innovation. As such demographic structure is reviewed in brief.

2.7.1 TOTAL POPULATION

Phaltan is second populous tahsil in satara district having 313627 total populations, which is 10 percent of district with 262827 rural and 50800 urban populations. (Table 1.1 and Fig 2.10)

2.7.2 POPULATION GROWTH

(a) Rural Population -

The absolute number of rural population increased in each decade after 1961 but the variations have near been uniform. According to census of India 2001, rural population is 83.8% to total population.

(b) Urban Population

Tahsil head quarter is Phaltan city; which is the only urban center in study region. In 1961 urban population were 13.56 % to total

Table No. 2.5
Decadal Growth of Population in Phaltan Tahsil (1961 – 2001)

Years	Total	Change	Rural	%	Urban	%
1961	140101	-	121099	86.44	19003	13.56
1971	186627	+46526	159853	85.65	26774	14.35
1981	224018	+37391	190159	84.88	33859	15.11
1991	273451	+49433	229084	83.77	44367	16.22
2001	313627	+40176	262827	83.8	50800	16.20

Source: District handbook of Satara (1961 – 2001)

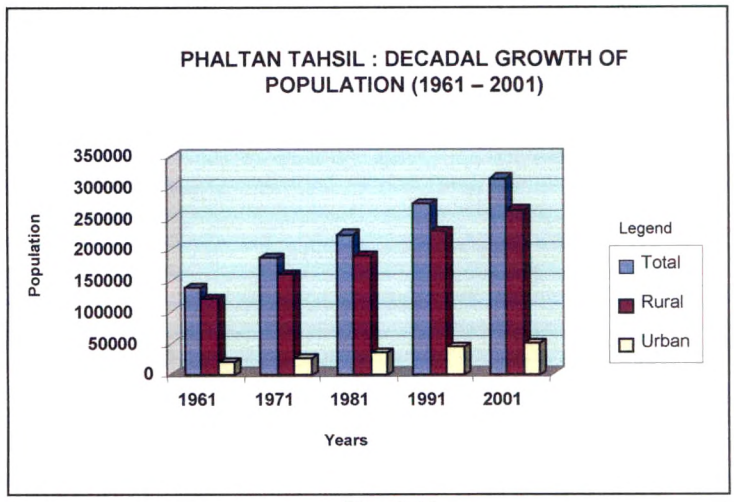


Fig. 2.10

population and its increase in every decade have been 1 %. However, in 2001 their decreases 0.02% to 1991 decade total population. According to census of India 2001, urban population is 16.20 % to total population.(Table.2.5)

2.7.3 DENSITY OF POPULATION

To simplify the complexities of aerial distribution, the researcher has employed iso-density lines of 100 persons per sq.km. to show the patterns of distribution of population in Phaltan tahsil.

i) Low Density Region:

The region lies between '100 to 200' is density lines including Girvi (127), Adarki (136) Revenue circles. This area where undulating topography, poor and shallow yellow-brown soils associated with scanty rainfall (below 500mm) have discomfort human settlement transforming into a drought prone area. Hence, the density of population is very low.

ii) Medium Density:

This includes revenue circles of Barad (275), Assu (244), Taradgaon (217) and Hole (230). It comprises the nearest parts of Nira river plains and same parts of canal irrigation.

iii) High Density:

This includes small portions of the Tahsil, mainly urban center of Phaltan city (350).

2.7.4 LITERACY

As a matter of convenience, literacy is defined as the ability to read and write one's name in one's own mother tongue. In India all those persons who can both read and write a simple message with understanding in any language are classified as literate. However according to 1991 census, all children of age 6 years or less are treated as illiterates even though they may be going to school and can read and

write odd words. Literacy is that qualitative attributes of development of an area (Chandna and Sindhu 1980).

Very high literacy rate (above 70 per cent) is found in Phaltan and Hole revenue circles. Moderate literacy rate (between 60 to 70 percent) is observed in Taradgaon and Assu circle, and low literacy rate (below 50 percent) is noted in Barad, Girvi and Adarki revenue circle.

2.7.5 SEX RATIO

In Phaltan tahsil there are 953 females for every thousand males. Generally, rural areas have a higher proportion of females than the urban areas. Nevertheless, according to census of India 2001(Table 1.1), the sex ratio figures for rural and urban area are 952 and 959 respectively as compare to the state average of 972 and 875 respectively. It may be noted that the rural sex ratio of the tahsil is higher and urban sex ratio is comparatively lower than the corresponding state sex ratios.

2.7.6 OCCUPATIONAL STRUCTURES

Out of the total working population of 144552 nearly 70.52 percent, (101949) are cultivators (60064) and agricultural laborers (41885) as the region is dominated by agricultural activity (Table 1.1). In general, their concentration is high in the northern part and decreases towards East and North of the region, of course cultivators constitutes maximum share in the total farm workers. Other workers population is 26.77 percent (38697) to total working population.

SUMMARY

The Phaltan tahsil has been characterized by the spatial variations in the physical factors which influence the development of rain water potential. Climatically the study region is hot and dry throughout the year except July to October. During this period, relative humidity is high.

Rainfall occurs during short spells of high intensity. Because of such intensities and short duration of rain, most of the rain falling on the surface tends to flow away rapidly, leaving very little for the recharge of groundwater. The most part of Girvi, Adarki and Barad revenue circles experience water shortage for domestic and agriculture use in every year. Therefore, the need of water conservation in both the seasons is essential.

The 'Deccan traps' present in the region, are mainly basalts, generally uniform in composition and dark grey in colour. Drainage in Phaltan tahsil is greatly influenced by relief formed by sub Mahadevo hills mostly located in southern side of tahsil. River Nira and Banganga from the main drainage systems in the region. The drainage pattern and slope of the region have provided suitable sites for the construction of many percolation tanks.

The soil of the study area has derived from the Deccan trap. Medium black fertile soils rich in nitrogenous content are present in river Nira vally. The southern part of Barad, Girvi and Adarki revenue circles has found shallow black and latrine soils, locally known as "Murmad" these are well drained soils for fruit plantation, it light in nature but lack in nitrogenous content.

The thasil records average 161 persons per sq.k.m., however, the Nira right bank canal (Northern region) tract of this tahsil have supported population where the density of population is relatively more than southern hilly region. From north to southward density has decreased.

The dry months are characterized by acute shortage of water for drinking, domestic & crops as they receive insignificant amount of rainfall. In summer season, many villages in southern hilly track face the problem of the drinking water. This has created the need of rainwater harvesting in the region.

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