

Chapter 1

GENERAL FEATURES OF PUNE DISTRICT

1.1 Overview of Pune District

1.1.1 Historical Background



Plate 1. Shaniwarwada Pune

Pune District is famous from the historical days due to the Great Maratha King Chh. Shivaji Maharaj, Peshwas and other great leaders and reformers of India of the pre-independence period. Pune District has always remained on the forefront being a major source of reformative thoughts and concepts in industrial, agricultural, social, economic and political fields. Pune is well known as the '**Queen of Deccan**' due to its scenic beauty and rich natural resources. Besides, it is famous for its religious and historical places. Pune City is known on the world map because of its educational, research and development institutions. The

district has importance as an important military base. Pune District is one of the most industrialized districts in Western Maharashtra.

1.1.2 Geographical Location

Pune District is located between 17°54' and 19°24' North latitude and 73°19' and 75°10' East longitude. The district has a geographical area of 15,642 sq.km. Pune District is bound by the Ahmadnagar district on the North-East, Solapur district on the South-East, Satara district on the South, Raigad district on the West and Thane district on the North-West. It is the second largest district in the state and covers 5.10% of the total geographical area of the state. The landscape of Pune District is distributed triangularly in Western Maharashtra at the foothills of the Sahyadri Mountains and is divided into three parts: "*Ghatmatha*", "*Maval*" and "*Desh*". The district has a general slope from the West to the South-East.

1.1.3 Administrative Set Up

Pune city is the divisional headquarter of Western Maharashtra and headquarter of the district. Administratively, Pune District is divided into 14 Taluka, 13 Panchayat Samitis (Blocks), 2 Municipal Corporations, 11 Municipal Councils, 3 Cantonment Boards and 1,844 villages (Table I).

1.1.4 Base Map of Pune District

The Base Map (**Map No. 1**) shows the administrative divisions of Pune District, which includes the district boundary, taluka boundaries, surface water bodies, rivers and location of district headquarter and taluka headquarters. The boundary of surrounding districts, connectivity between district headquarter and taluka headquarters and with the surrounding districts through road and rail network is also shown.

Table I. Administrative Divisions of Pune District

Name	Taluka		No. of Villages	No. of Towns	Name of Municipal Corporation	Name of Municipal Council	Name of Cantonment Board
	Area (sq.km.)*	Headquarter					
Pune City	184	Pune	0	3	Pune	---	i) Pune ii) Khadki
Khed	1,400	Rajgurunagar	186	3	---	Alandi	---
Ambegaon	1,043	Ambegaon	143	1	---	---	---
Junnar	1,385	Junnar	181	1	---	Junnar	---
Shirur	1,557	Shirur	117	1	---	Shirur	---
Daund	1,290	Daund	103	1	---	Daund	---
Indapur	1,468	Indapur	143	1	---	Indapur	---
Baramati	1,337	Baramati	117	1	---	Baramati	---
Purandhar	1,104	Sasvad	107	3	---	i) Sasvad ii) Jejuri	---
Haveli	1,337	Pune	102	3	Pimpri-Chinchwad	---	Dehu Road
Bhor	892	Bhor	195	1	---	Bhor	---
Velhe	497	Velhe	128	0	---	---	---
Mulshi	1,039	Paud	141	1	---	---	---
Maval	1,131	Wadgaon	181	5	---	i) Talegaon - Dabhade ii) Lonavala	---
Total	15,642	14	1,844	25	2	11	3

Note: ---: Not applicable.

Source: 1. Census of India, 2001.

2. *District Social & Economical Review Report, Economics & Statistical Department, Pune District (2002).

1.1.5 Village Location Map

The Village Location map is a reference map and shows taluka wise location of villages within the district having post office and / or situated on the major roads of the district.

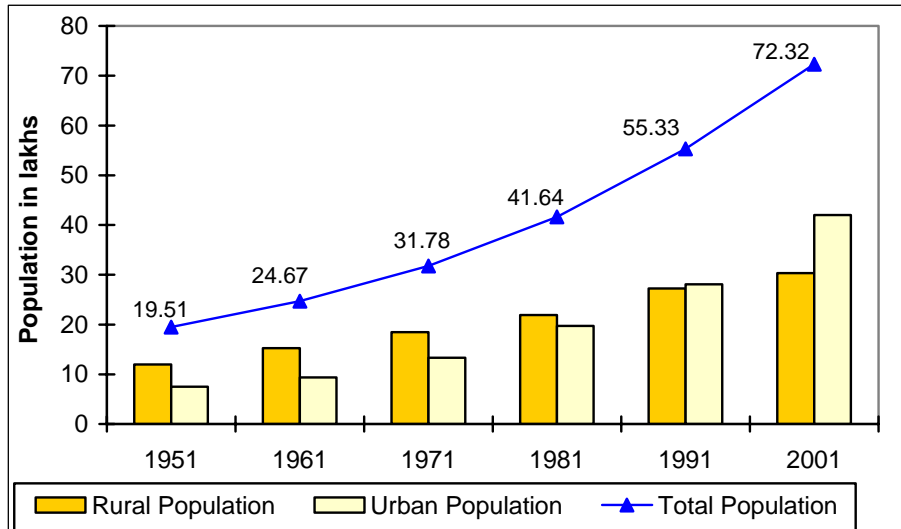
1.1.6 Population Distribution

According to the 2001 census, the population of Pune District is 72.32 lakh (**Annexure 1: Table 1**). Over the past 6 decades, the population of the district has increased from 19.5 lakh to 72.32 lakh, i.e. an increase by about three and a half times (Fig.1). Decadal population growth of Pune city during 1991 to 2001 shows an alarming growth rate i.e 29% increase (from 26% to 55%), which is the highest among all Taluka of the district.

Distribution of population among the Taluka of the district show distinct variations. The highest population is of Pune city (26.96 lakh), followed by the surrounding area of Haveli Taluka (13.53 lakh). Populations among the remaining Taluka vary between 0.55 lakh (Velhe Tal.) and 3.73 lakh (Baramati Tal.). Taluka Velhe has the lowest geographical area, population, population density and decadal growth in population.

Highest population density in Pune city (14,652 persons per sq. km.), may be attributed to the rapid growth in the industrial and commercial sectors. Immigration due to job opportunities and educational institutes has also resulted in the influx of a large amount of persons. The urban agglomeration around the Pune city along with high level of urbanization is also an added reason for the population growth of Pune city.

Figure 1. Decadal Growth in Urban and Rural Populations of Pune District



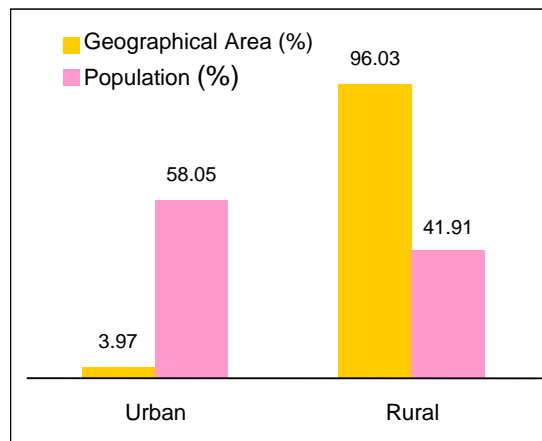
Source: District Social & Economical Review Report, Economics & Statistical Department, Pune District (2000-01)

1.1.7 Urban - Rural Composition

According to the 2001 census, total urban population of the district is 42.01 lakh and the rural population is 30.32 lakh (**Annexure 1:** Table 2 and 3). Higher population density in the urban area, i.e. 6,700 as against 202 in the rural area, is because of employment opportunities in the secondary sector, which includes the manufacturing, processing, servicing and the construction sector.

The urban to rural population ratio in the district is highly imbalanced (Fig.2). Of the total population, urban population is 58%, which is spread over only 4% geographical area. Whereas, remaining 42% rural population is spread over 96% geographical area of the district (Fig.2). The urban population density indicates the degree of urbanization in the district.

Figure 2. Urban: Rural population distribution in Pune District



Source: Census of India, 2001

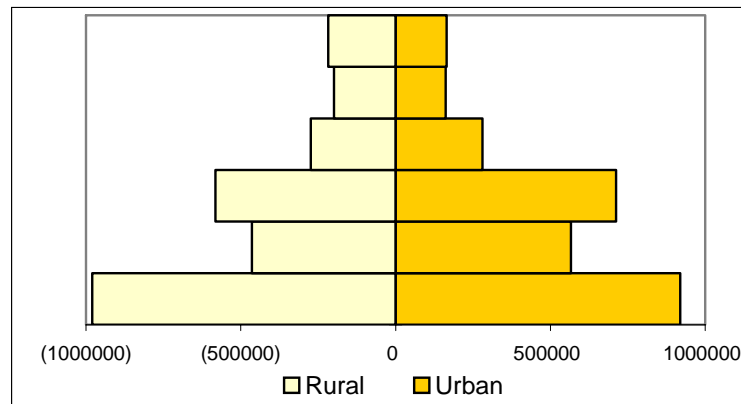
1.1.8 Age and Sex

i. Age

More than 53% population of the district is below 24 years of age and 40% population is in the age group of 24 and 59 years. Only about 7% survivors are above the age of 60 years (Fig. 3).

The rural urban trend shows almost similar distribution of age groups. It is further evident that the rural population beyond the age of 50 years shows a slightly higher rate of survival than that in urban areas.

Figure 3. Rural- Urban Population Age Pyramid for Pune district

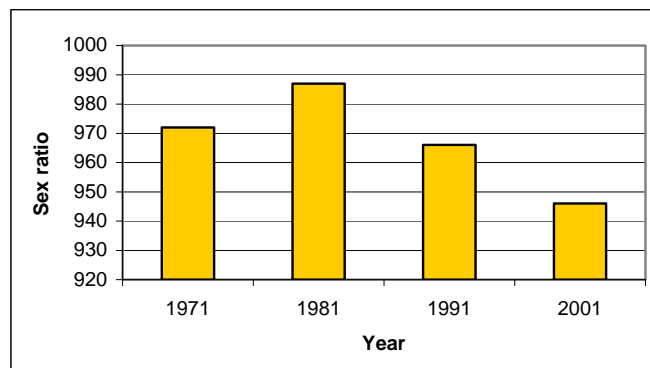


Source: Census of India, 1991

ii. Sex

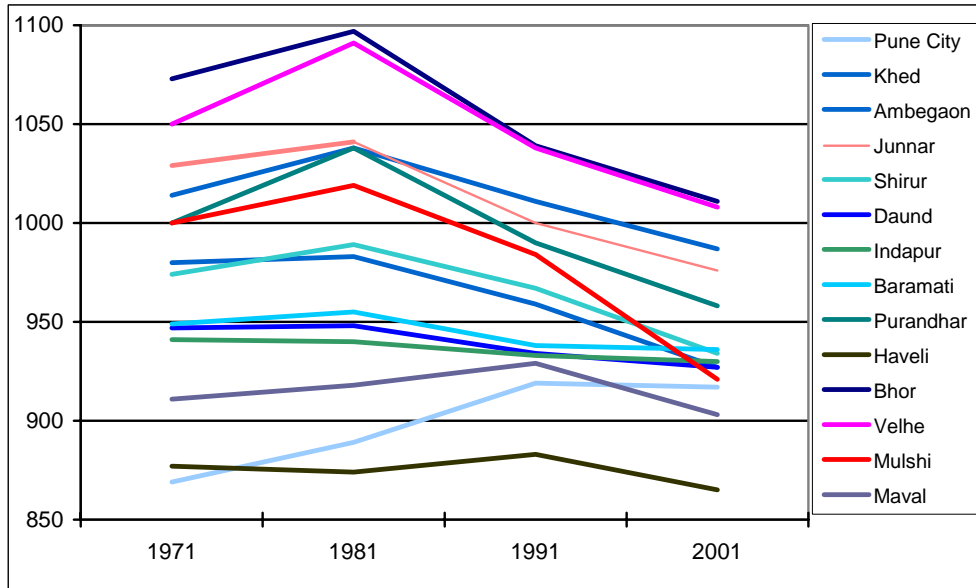
It is observed that there has been a dominance of male population over female population throughout the past 4 decades (Fig. 4). For the decade of 2001, the Taluka Bhor and Velhe show a dominance of female population. The sex ratio observed at Haveli taluka is all time low (865 females to 1000 males), during 1971 to 2001 (Fig. 5). The male population in the district (except Taluka Velhe and Bhor) is high, with a continuous drop in the decadal sex ratio during 1971 to 2001. Pune city is an exception, showing an increase in the sex ratio over the decades. Taluka wise sex ratio of Pune District has been given in **Annexure 1: Table 4**.

Figure 4. Average Sex Ratio in Pune district



Source: District Social & Economical Review Report, Economics & Statistical Department, Pune District (2000-01).

Figure 5. Talukawise trends of Sex Ratio in Pune district

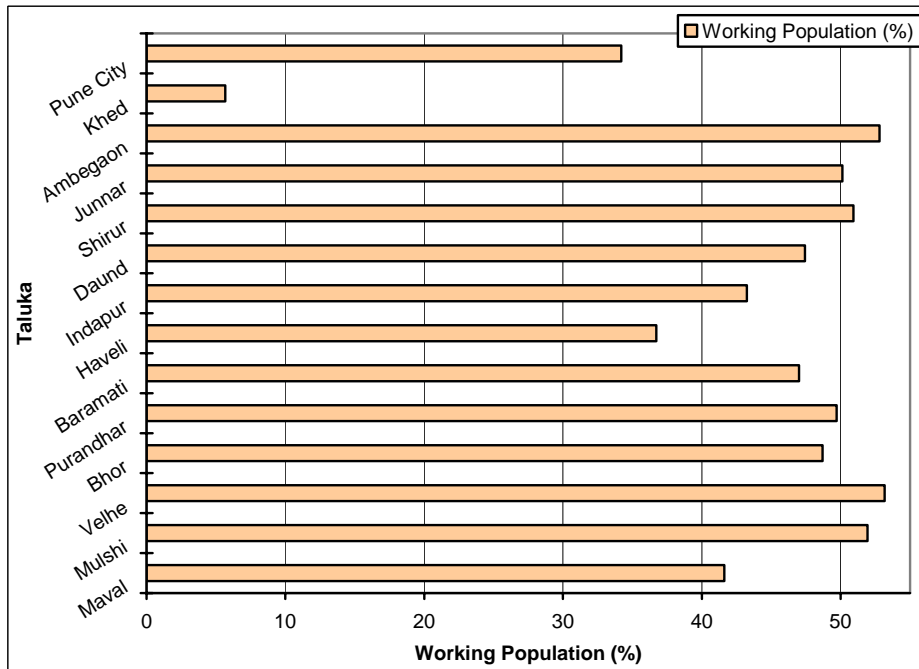


Source: District Social & Economical Review Report, Economics & Statistical Department, Pune District (2000-01).

1.1.9 Occupational Pattern

The district as a whole has about 41% of the total population as working population (**Annexure 1:** Table 5). Taluka Velhe shows the highest percentage of working population of about 53%. (Fig.6). The non-working population is highest in Pune city, i.e. about 66% and in Haveli Taluka it is 63%.

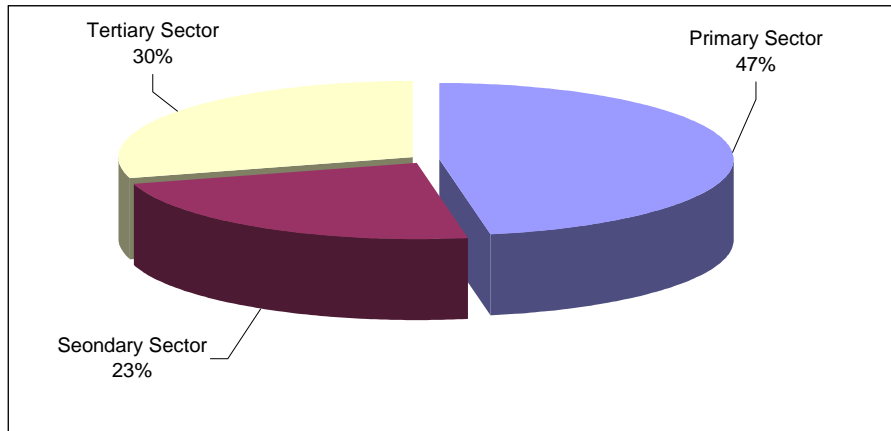
Figure 6. Working Population as a percentage of Total Population



Source: Census of India, 2001.

Among the total working population 47% workers are engaged in primary sector (Census 1991) (Fig. 7 and **Annexure 1**: Table 6). The maximum numbers of primary workers within the entire district belong to the Junnar Taluka and maximum numbers of secondary and tertiary sector belong to Pune city. In Pune city, a large proportion of the working population, i.e. about 60 % belongs to the tertiary sector.

Figure 7. Sector wise distributions of Workers in Pune district

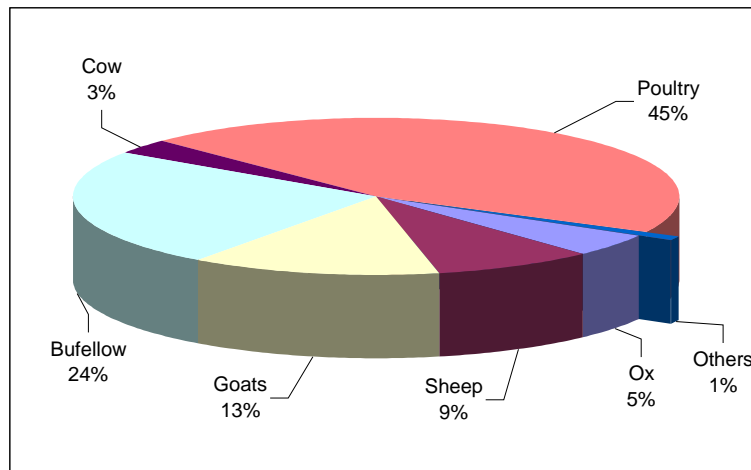


Source: Census of India, 1991.

1.1.10 Livestock

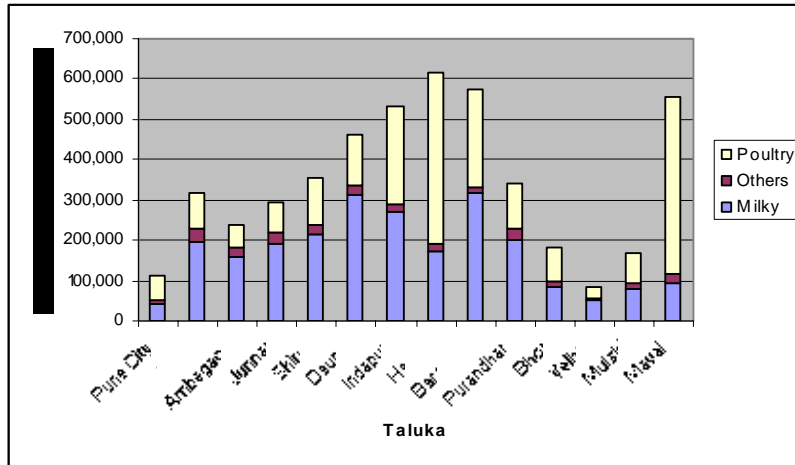
Livestock population in pune district is divided into poultry (45%) and milking animals (49%) such as Buffelo, Goat, Sheep and Cow (Fig.8). Higher population of Poultry in Taluka Haveli, Maval, Indapur and Baramati catre to the demand of urban area. Similarly, a large population of milking animals (**Annexure-I**, Table-7) is because of availability of fodder, suitable climate and accessible potential market.

Figure 8. Distribution of Livestock in Pune district



Source: District Social & Economical Review Report, Economics & Statistical Department, Pune District (2000-01).

Figure 9. Taluka wise distribution of Livestock (1997)



Source: District Social & Economical Review Report, Economics & Statistical Department, Pune District (2000-01).

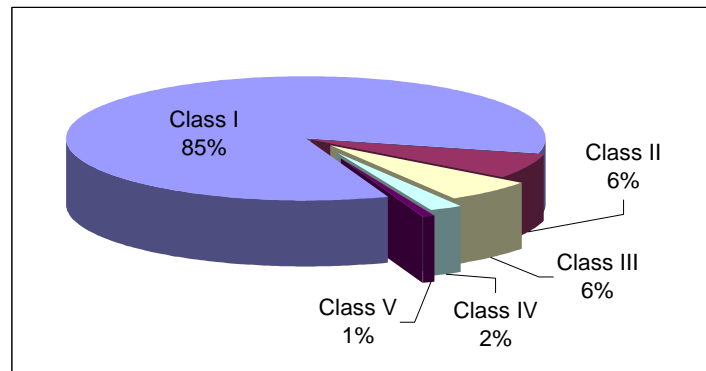
1.2 Settlement Pattern

1.2.1 Size

According to the census definition, the district has 25 towns (Class-I : 2 Nos., Class-II : 4 Nos., Class-III : 8 Nos., Class-IV : 7 Nos., and Class-V : 4 Nos. (Table-II).

Distribution of urban population in the towns is disproportionate (Fig.10). The Class-I towns, viz., Pune Municipal Corporation and Pimpri-Chinchwad Municipal Corporation are the most populated towns covering 85% urban population in the district.

Figure 10. Distribution of population based on town size



Source: Census of India, 2001.

1.2.2 Rural Settlements

There are in all about 1844 villages within the district (**Annexure 1:** Table 2), with a population of about 30.32 lakh. Though there is no significant change in the rural population, except for Haveli Taluka, which shows a sharp drop in its rural population within the last decade. This may be attributed to the fact that within the decade of 2001, about 100 villages from this taluka have become urbanized. Increased urbanization has lead to a decrease in rural population.

1.2.3 Settlement Map

The Settlement Map [Map No. 2 (A)] shows the locations of the classified towns as per Census (Class I to Class V). Settlement Map [Map No. 2 (B)] shows the taluka wise population density (persons/ sq.km).

Table II. Classifications of Towns in Pune district

Sr. No.	Town	Taluka	Classification		Population (2001)
			Class	Civic status	
1.	Pune	Pune City	I	Municipal Corporation	25,38,473
2.	Pimpri Chinchwad	Haveli	I	Municipal Corporation	10,12,472
3.	Pune	Pune City	II	Cantonment Board	79,965
4.	Khadki	Pune City	II	Cantonment Board	77,473
5.	Lonavala	Maval	II	Municipal Council	55,652
6.	Baramati	Baramati	II	Municipal Council	51,334
7.	Dehu Road	Haveli	III	Cantonment Board	46,921
8.	Talegaon Dabhade	Maval	III	Municipal Council	42,578
9.	Daund	Daund	III	Municipal Council	42,204
10.	Shirur	Shirur	III	Municipal Council	26,999
11.	Sasvad	Purandhar	III	Municipal Council	26,689
12.	Junnar	Junnar	III	Municipal Council	24,741
13.	Chakan	Khed	III	Census Town	21,680
14.	Indapur	Indapur	III	Municipal Council	21,592
15.	Bhor	Bhor	IV	Municipal Council	17,886
16.	Rajgurunagar (Khed)	Khed	IV	Census Town	17,636
17.	Alandi	Khed	IV	Municipal Council	17,565
18.	Manchar	Ambegaon	IV	Census Town	13,799
19.	Jejuri	Purandhar	IV	Municipal Council	12,000
20.	Wadgaon	Maval	IV	Census Town	11,364
21.	Shivatkar (Nira)	Purandhar	IV	Census Town	10,135
22.	Khandala	Maval	V	Census Town	9,804
23.	Kusgaon Budruk	Maval	V	Census Town	8,567
24.	Tathavade	Mulshi	V	Census Town	7,976
25.	Dehu	Haveli	V	Census Town	5,332
Total census population					42,00,837

Source: Census 2001

Note: Class-I : Population 1,00,000 and above; Class-II : Population 50,000 to 99,999;
Class-III: Population 20,000 to 49,999; Class-IV : Population 10,000 to 19,999;
Class-V : Population 5,000 to 9,999.

1.3 Transport and Trade Linkages

The district is well connected with the State capital and surrounding district headquarters through road and rail linkages (except Nashik). The road network consists of Express Highways, National Highways, State Highways and Major District Roads. The rail network consists of both broad gauge (Electrified and Non Electrified) double track as well as single track lines. The district headquarter has connectivity through airways for transport and trade to major airports within the country and to select international destinations. In spite of availability of perennial river stretches, there is no significant utilization of waterways in the district.

1.3.1 Road Network

The district has a total length of 13,642 km of roads (2001), of which 5394 km roads are of Bituminous surface, 3554 km roads of waterbound macadam surface and 4694 km of other surface roads i.e. unmetalled road (**Annexure 1: Table 8**).

The roads are classified according to their importance by the authorities who maintain them. Of the total road length in the district, 331 km road length is covered by National Highways and 1368 km by State Highways. The Major and Other district Roads have a total length of 5,388 km, which passes through all the Taluka. Almost all the villages are

well connected by water bound macadam road. The total length of village roads is 6,555 km. (**Annexure 1:** Table 8, 9 and 10).

Following three National Highways pass through the district:

- i. **National Highway No.4 (Mumbai-Bangalore):** The NH-4, passes through the following places in the district: Khandala, Lonavala, Talegaon, Chinchwad, Pune and Khed-Shivapur. It enters the district from Khopoli (Dist. Raigad) at Khandala (Tal. Maval) and exits from Sarole (Tal. Bhore) in Pune district and continues further towards the Satara district. The total length of NH-4 in the district is around 120 km.
- ii. **National Highway No.9 (Pune-Solapur- Hyderabad):** The NH-9 starts at Pune and passes through Loni, Bhigwan and Indapur. NH-9 ends in the district at Hingangaon (Tal. Indapur) and continues towards the Solapur district. The total length of NH-9 in the district is around 152 km.
- iii. **National Highway No. 50 (Pune-Nashik):** The NH-50 originates at Pune and passes through Chakan, Rajgurunagar, Manchar, Narayangaon and Alephata, which ends at Alekhind (Tal. Junnar) and continues further towards Sangamner in the Nashik district. The total length of NH-50 in the district is around 95 km.

The **Mumbai - Pune Expressway** connects Mumbai and Pune, passes through the Khandala and Lonavala. It is a 100m concrete road having six lanes, divided in the center by a 7m wide divider. The length of the Expressway within the district is 44.5km.

Details of roads passing through tribal areas within the district are given in **Annexure 1:** Table 11. The total road length passing through the tribal area is 672 km.



Plate 2. Mumbai - Pune Expressway

1.3.2 Rail Network

The broad gauge (B.G.) single and double track rail length within the district have a total length of 311 km. (**Annexure 1:** Table 12). Of these, single line (B.G.) is 162 km in length and the double line (B.G.) is 149 km in length. Pune and Daund are the two railway junctions in Pune district.

Following are the three main railway routes passing through the district:

- i. **Mumbai-Pune-Solapur Rail route:** It enroutes the Khandala, Lonavala, Talegaon, Pune Jn., Urali Kanchan and Daund Jn.
- ii. **Pune-Miraj Rail route:** It enroutes Fursungi, Alandi (Mhatobachi), Shidwane, Jejuri, Dondaj, Walhe, Nira.
- iii. **Daund-Baramati Rail route:** It enroutes Shirsuphal, katphal, Tandulwadi.



Plate 3. Mumbai-Pune railway line passing through the ghats at Khandala

1.3.3 Air Route

Pune is well connected through domestic airlines with the entire country (**Annexure 1: Table 12**). The airport located at Lohogaon has recently acquired the status of an international airport and is being used to carry domestic as well as international traffic. Also, it is proposed to develop an international air-cargo hub near the same place.

1.3.4 Ferry

Water transportation is mostly used to connect the remote villages in the Sahyadri hill ranges. Ferry facility is available at village Mulshi-Kh. in the Maval Taluka and at village Varasgaon in the Velhe Taluka, which is being used for waterways transportation.

1.3.5 Transportation Network Map

The Transportation Network Map (**Map No. 3**) shows the connectivity of important towns within Pune District with the surrounding districts through road and rail. Location of airport has also been shown.

1.4 Climate

Pune District forms a part of the tropical monsoon land and therefore shows a significant seasonal variation in temperature as well as rainfall conditions. Climatic conditions within the district have been shown in **Map No. 4**. The climate of the Western region of Pune District is cool, whereas the Eastern part is hot and dry.

1.4.1 Rainfall

i. Rainfall Distribution

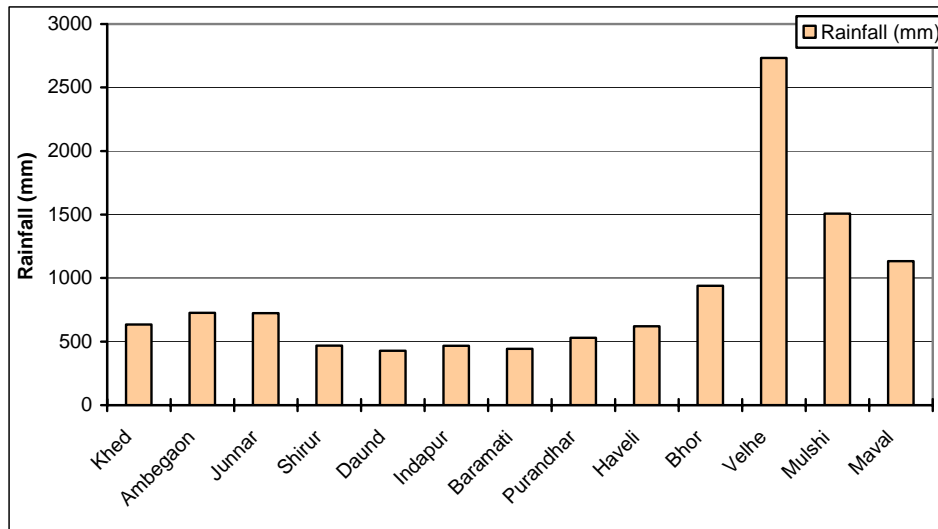
Owing to the geographical conditions within the district, the rainfall unevenly distributed. The Western part of the district adjacent to the West coast is a hilly area having forest cover, due to which the rainfall intensity is more in this area as compared to the Eastern parts. Most of this rain is brought by the SouthWest monsoon winds during the Summer and about 87% of rain falls during the monsoon months.

The monsoon arrives in the month of June, with the maximum intensity of rainfall during the month of July followed by August. Talukawise rainfall received during year 2001 is depicted at **Annexure 1: Table 13**.

Taluka falling in the highest rainfall intensity zone (rainfall >1000 mm) are Velhe, Mulshi and Maval (Fig. 11). Physiography of this area shows a hilly and undulating terrain, with altitude ranging between 100 and 500 m above MSL. Taluka falling in the moderate rainfall intensity zone (rainfall between 500 and 1000 mm) is Bhor, Ambegaon, Junnar, Khed, Haveli, Pune city and Purandhar. Taluka with the lowest rainfall intensity, the dry and semi-arid zone (rainfall < 500 mm) are Shirur, Daund, Indapur and Baramati.

The decline in the amount of rainfall towards the East is due to the Sahyadrian mountainous zone, which creates a rain shadow region hardly 100 km East of the divide.

Figure 11. Talukawise total rainfall in Pune District (2001)



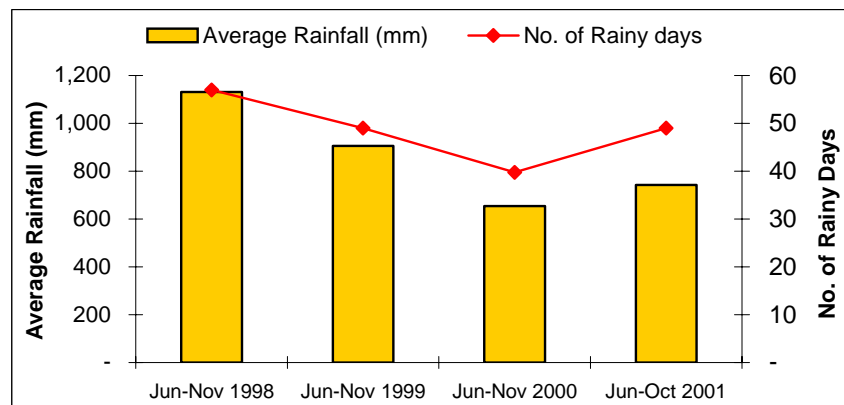
Source: District Agricultural office (Z.P.) Pune (2002).

ii. Duration and Intensity

Intensity of rainfall is the total rainfall divided by the total number of rainy days for a particular area. Thus the number of rainy days and the amount of rains play a significant role in deciding the rainfall intensity.

The district shows an average of 48 rainy days, as observed from the period 1998 to 2001 (Fig.12). The minimum rainy days are in the month of June when the monsoon just begins to set in and the rainfall is in drizzles. The maximum numbers of rainy days are during the month of July and this is usually followed by a dry spell in August. A maximum amount of rainfall during these two months considerably reduces the risk to **Kharif** crops. In September, the rains occur in drizzles with occasional heavy rains. Rains in October and November, though not very intensive, are a vital requirement for the **Rabi** crops.

Figure 12. Average annual rainfall and number of rainy days in Pune District (1998-2001)



Source: Dy. Director-General, Regional Metrological Department, Mumbai (2002).

1.4.2 Temperature and Humidity

i. Temperature Conditions

April and May are the hottest months in the district. Maximum temperature during these months often rises above 36°C. The Western region of Pune District i.e. Tal. Junnar, Ambegaon, Khed, Maval, Mulshi and Velhe are cool, whereas the Eastern part i.e. Tal. Shirur, Daund, Baramati and Indapur are hot and dry. December and January are the coolest months, when average monthly temperature falls as low as 11.2°C (**Annexure 1: Table 14**).

ii. Range of Temperature

The daily range of temperatures is highest in the Eastern part of the district, where the Summers are relatively hotter and winters relatively colder. From following Fig.13 it is observed that, the daily range in temperature is the least during the month of July and August. This is owing to the fact that the amount of solar radiation received in July is relatively less as compared to April or May, due to cloud cover and also due to the considerable loss of heat energy as wet surfaces get evaporated.

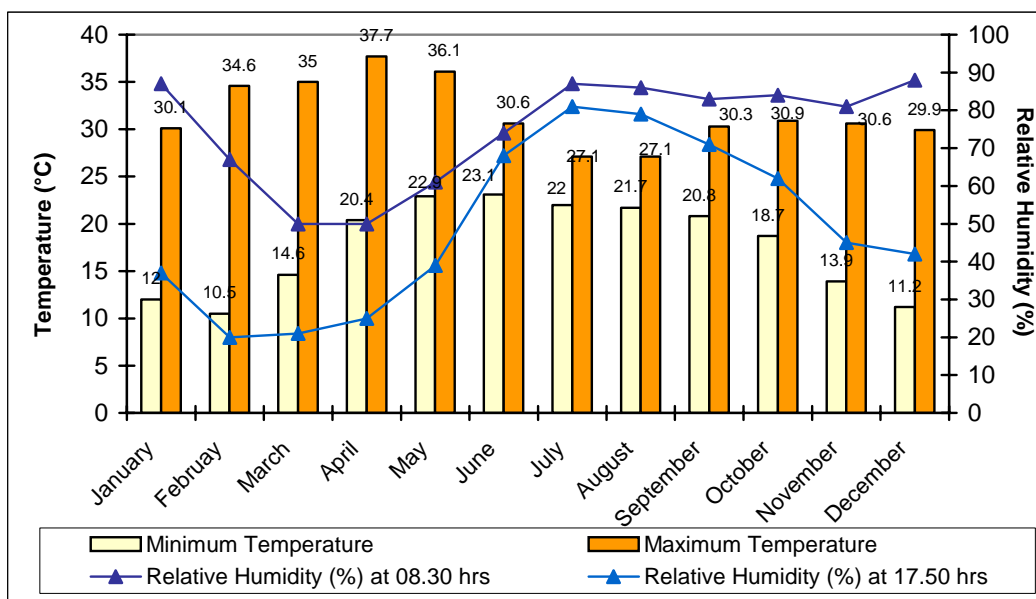
Thus, the daily temperature comes down and night temperature become steady, as terrestrial heat is unable to escape due to the water vapor present in the atmosphere. In Summer, the average temperature varies between 10.5°C and 37.7°C, whereas in winter, it ranges from 11.2°C to 30.9°C.

iii. Humidity Conditions

Humidity is low during the Summer months due to increased evaporation losses from the atmosphere. The diurnal variations in humidity during this period are high, water vapor gets condensed due to falling nighttime temperatures and the daytime temperatures are high.

Fig. 13 & Table 14 at **Annexure-1** give details about humidity pattern within the district. In the Summer months the relative humidity ranges from a minimum of 20% to maximum of 67% during the day. During the monsoon period, the relative humidity varies from 68% to 87%. The relative humidity during winter shows maximum diurnal variation varying from 37% to 88%.

Figure 13. Annual Variations in Temperature and Humidity at Pune (2001)

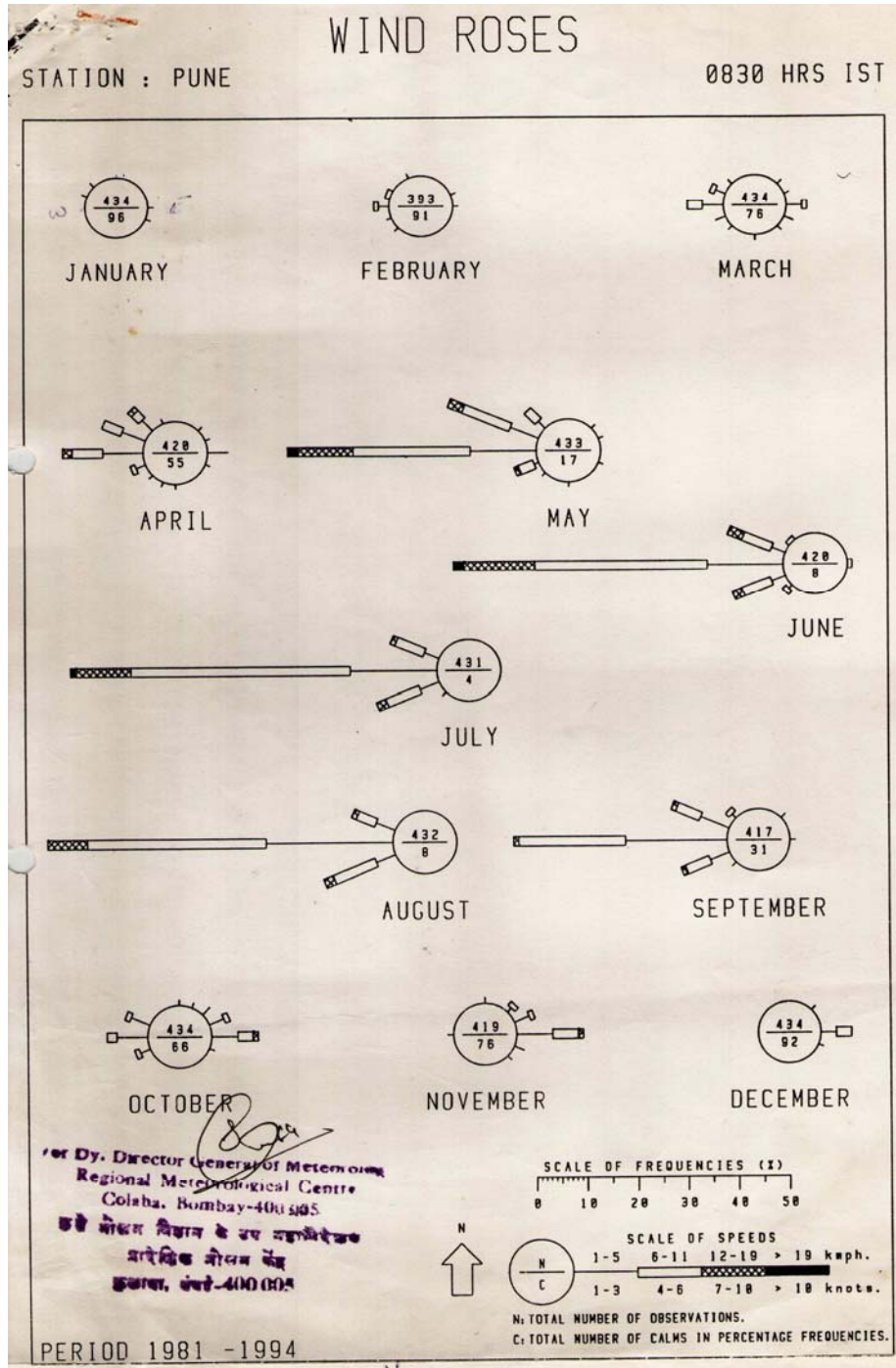


Source: Dy. Director-General, Regional Metrological Department, Pune (2001).

1.4.3 Winds:

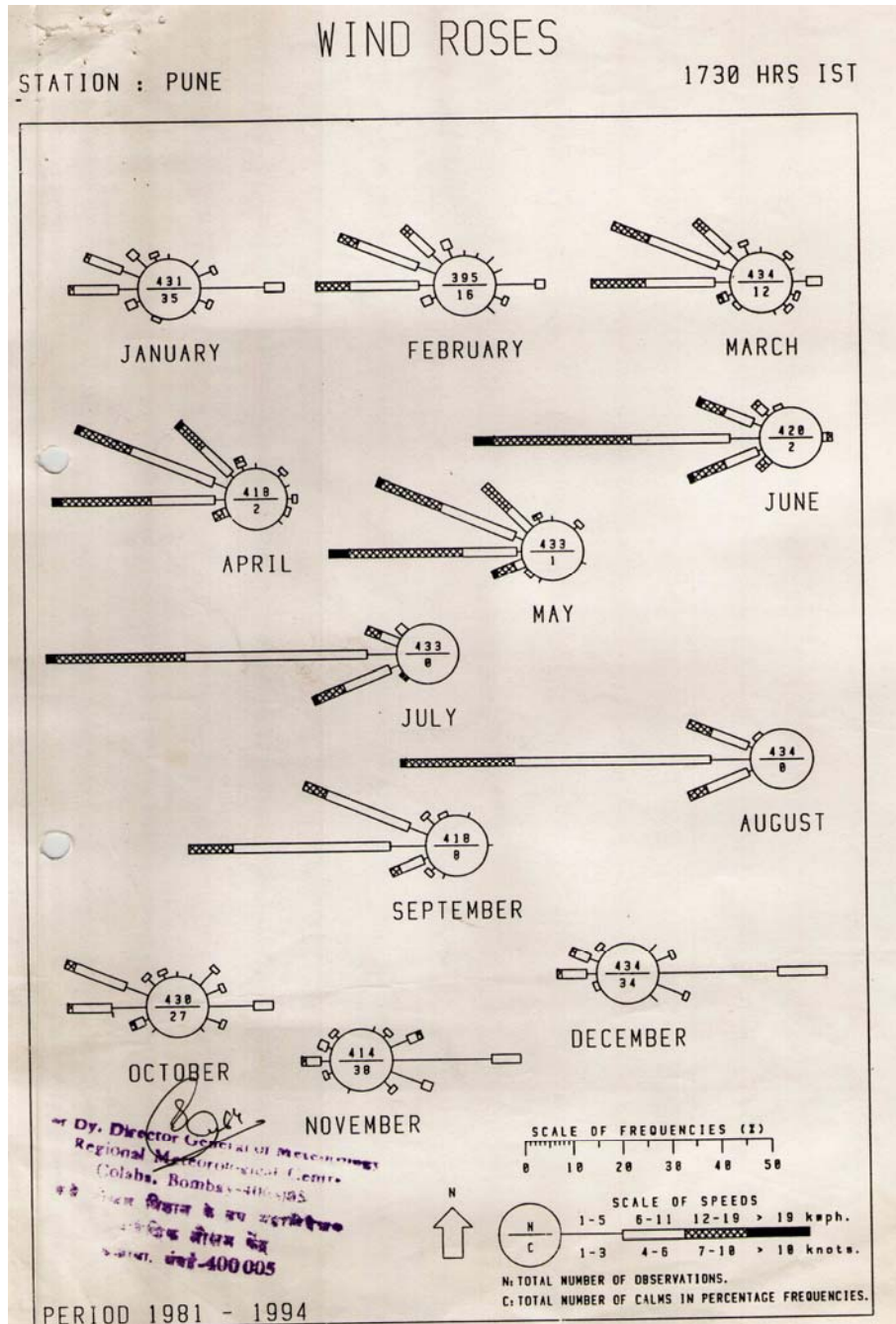
For Pune station, wind rose diagram available for period of 1981 to 1994 from the office of Dy. Director-General, Regional Meteorological Department, Mumbai. The wind rose diagram for 8.30 hrs in the morning and 5.30 hrs the evening is shown below:

1) Wind Rose for 8.30 hrs.:



Source: Dy. Director-General, Regional Meteorological Department, Pune (2001)

2) **Wind Rose for 5.30 hrs.:**



Source: Dy. Director-General, Regional Metrological Department, Pune (2001)

i. **Direction**

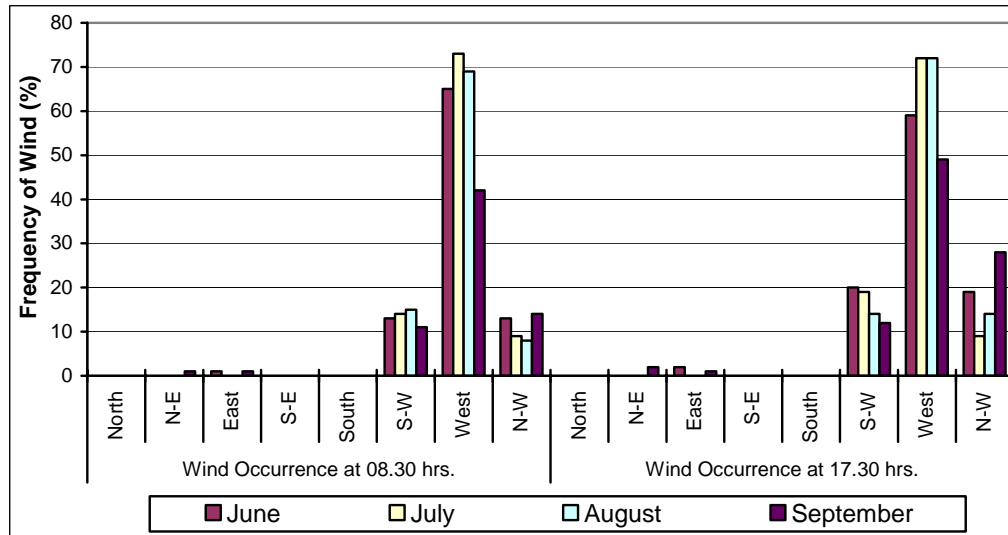
Based on the evaluation of the wind rose data for the period from 1981 to 1994 (**Annexure 1: Table 15**), for morning and evening time, it can be said that the overall wind direction for the district is from the West to South West, with absolutely no wind from the South and an infinitesimal percentage of wind from the North direction (Fig.15).

The predominant winds from the West and South West direction are responsible for the monsoons as they carry moisture-laden clouds from the Arabian Sea.

ii. Frequency

A distinct variation can be seen in the seasonal pattern of the wind frequency. Wind frequency is more during the monsoon season, with percentage of frequency reaching as high as 73% with not much of diurnal variation (Fig.14). During the monsoons the period of calm is the least of all the seasons (Fig.17).

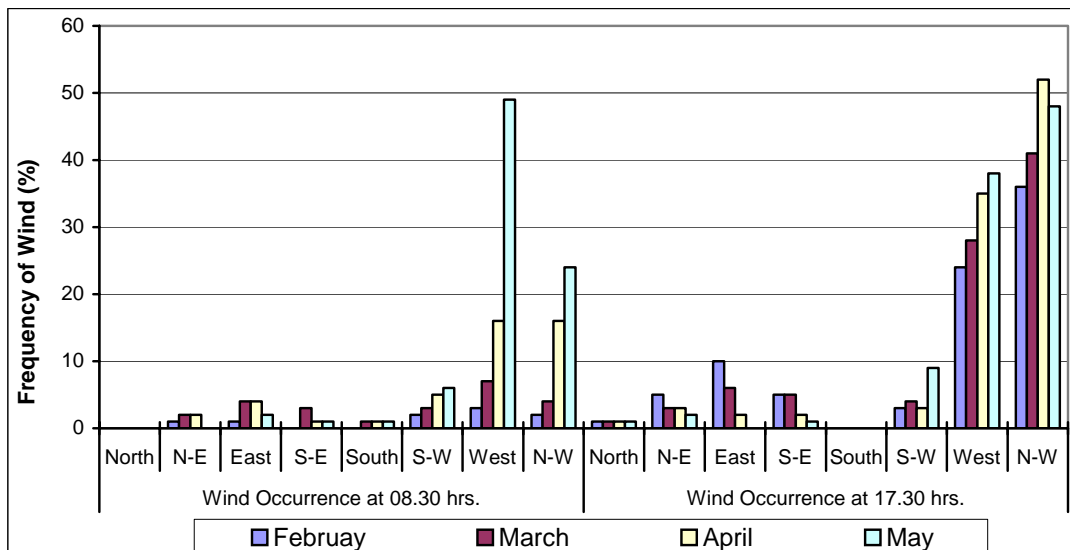
Figure 14. Diurnal variations in frequency of wind during Monsoons



Source: Dy. Director-General, Regional Meteorological Department, Mumbai (2002).

There is moderate amount of wind during the Summer months from the West to North west direction, upto about 52% with maximum wind during the evening (Fig.15). A period of calm can be felt during the morning hours with high diurnal variations (Fig.17).

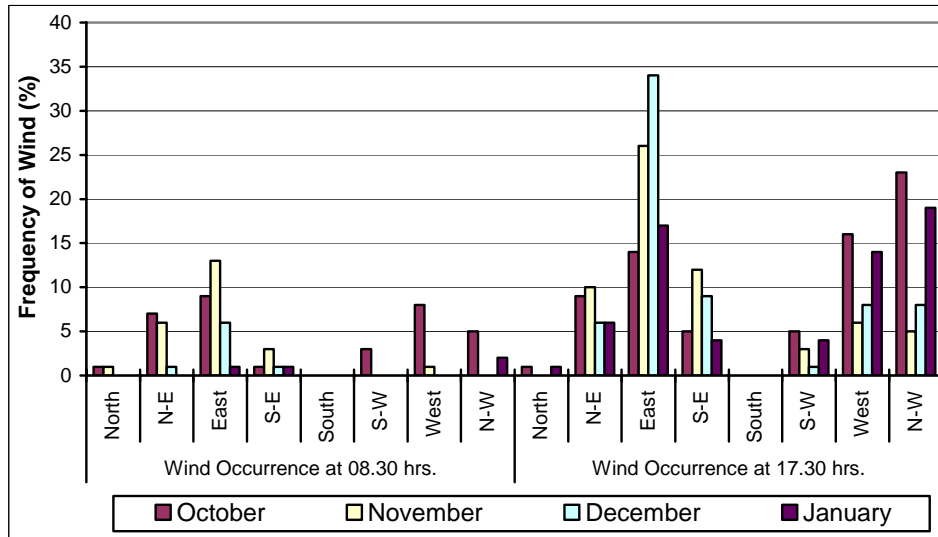
Figure 15. Diurnal variations in frequency of wind during Summer



Source: Dy. Director-General, Regional Meteorological Department, Mumbai (2002).

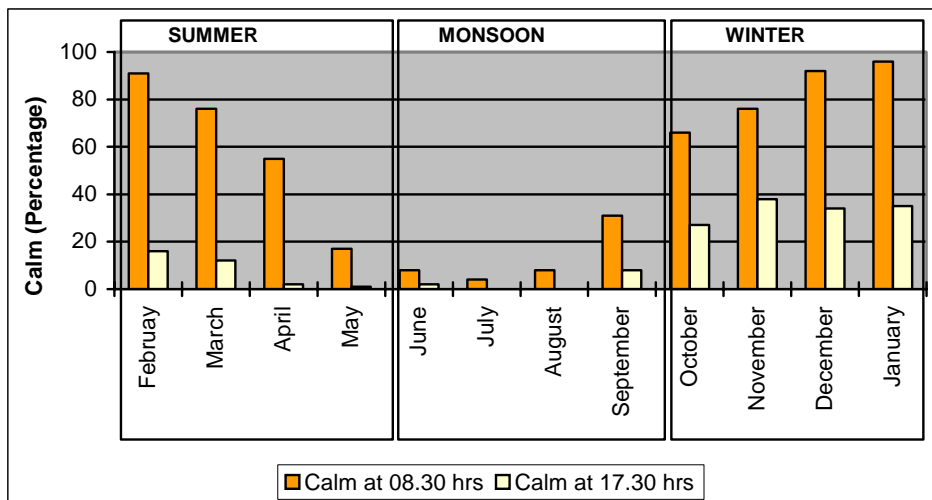
In winter, the frequency of wind is upto about 34%, not from any one direction specifically and with a reduced diurnal variation (Fig.16).

Figure 16. Diurnal variations in frequency of wind during Winter



Source: Dy. Director-General, Regional Meteorological Department, Mumbai (2002).

Figure 17. Distribution of calm wind during three seasons in Pune District
(For the period of 1981-1994)



Source: Dy. Director-General, Regional Meteorological Department, Mumbai (2002).

1.4.4 Climate Map

The rainfall variations in different Taluka of the district have been shown in the Climate Map (Map No. 4). Velhe Taluka receives the maximum rainfall (>1500mm) followed by Mulshi and Maval Taluka have rainfall between 1001 and 1500mm. The rainfall ranges between 801 and 1000 mm for Taluka Bhore, whereas between 601 and 800 mm for Taluka Junnar and Ambegaon. The Taluka Khed, Haveli, Pune-city, Purandhar, Shirur and Indapur receive comparatively low rainfall i.e. ranging from 401 to 600 mm. The Lowest rainfall (<400mm) occurs in Taluka Baramati and Daund.

1.5 Natural Hazards

Natural disasters threaten sustainable economic development worldwide. Natural hazards like earthquakes, floods, tropical storms, droughts and other calamities may

result in to loss of life and property worth millions of rupees. Disasters destroy decades of human effort and investments, thereby placing new demands on society for reconstruction and rehabilitation.

Earthquakes and floods have affected Pune District in the past. The details of the areas which are susceptible to natural hazards have to be avoided for siting of industries.

1.5.1 Earthquake Prone Areas

Earthquakes are generally regarded as the most destructive among natural calamities. Due to the presence of many structured hills within Pune district, occurrences of earthquakes take place. Fault lines are scattered throughout the district and these areas are minor earthquake prone areas.

According to the IS 1893 Part I, 2002, the state has been sub-divided into two earthquake damage risk zones. In the Pune District the small South-Waste side portion of Taluka Bhor and Velhe fall under the Zone-IV, this is a high damage risk zone. The remaining part of the district falls under the Zone-III, which is a moderate damage risk zone.

During the recent years major earthquake measuring 6.3 on the Richter scale, took place on the 30th of September 1993, at Killari in Latur District. The effects of this earthquake were felt in 11 districts surrounding Latur including Pune.

1.5.2 Flood Prone Areas

Most of the Taluka in Pune District are flood prone (**Annexure 1**: Table 16). The table shows the location of the villages affected by flood 1 in 25 years and 1 in 100 years. The taluka with maximum number of villages likely to be affected by flood (1 in 25 years) are Baramati, Bhor, Daund and Ambegaon. River Mula, Mutha, Pauna, Indrayani and Bhima are likely to cause flooding in Tal. Haveli.

The rivers likely to cause flooding are River *Bhima* (Tal. Shirur, Daund, Indapur and Haveli), River *Mula* (Pune city), River *Mutha* (Pune city and Tal. Mulshi), River *Indrayani* (Tal. Khed, Haveli and Maval), River *Ghod* (Tal. Ambegaon), River *Mina* and *Pushpavati* (Tal. Junnar), River *Nira* (Tal. Indapur and Purandhar) and River *Pauna* (Tal. Haveli).

1.5.3 Landslide Prone Areas

Due to the heavy rainfall in the rainy season, landslide occurs in the Taluka Ambegaon, Junnar and Mulshi. Landslide prone villages in the district are listed at **Annexure 1**: Table 17).

1.5.4 Natural Hazards Map

The Natural Hazards Map (**Map No. 5**) shows the areas prone to natural hazards in the district viz. earthquake, floods and landslides. South-Western part of Bhor and Velhe Taluka are earthquake prone and falls under high damage risk Zone-IV. Remaining district falls under Zone-III (Moderate Risk). Locations of flood prone villages, both once in 25 years & once in 100 years are also shown on map.

