

CHAPTER - II

Topography and Climate

CHAPTER 2

TOPOGRAPHY AND CLIMATE

2.1 Main Geographical Boundaries

The area of Kanakeshwar Hills and Revas-Alibag-Revdanda Coastal belt lies in Alibag Taluka of present Raigad District. (Formerly Kolaba District). For the entire area under consideration latitudes are $18^{\circ} 33'$ - $18^{\circ} 45'$ N and longitudes are $72^{\circ} 50'$ - $72^{\circ} 58'$ E. (Map 1) The East-west breadth of the area under studies is approximately 15 Km. while North-south length is about 19 Km. On its North it is bounded by Thane District, in between the two, lies the Dharamtar Creek. On its East the area is delimited by the descending spur of main Sahyadrian range, the vegetation of which contributes to the major bulk of the project. The Southern boundary is demarcated by the river Kundalika that meets the Arabian Sea forming the Western boundary of the area under consideration.

2.2 Geology of the Area under investigation

The area covered under present studies lies in toposheet No. 47-B/14. The coastal line stretches from Revas in the north, to Revdanda in the south. The major



AREA UNDER STUDY

creeks along the coast are Dharamtar, Alibag and Kundalika estuary.

Leaving aside the flat uneven plains of the coast, approximately 2 Km or so in width, the rest of the area is hilly. The main hill ranges are those of Kanakeshwar that extend north-south with the highest point 388 m. and that of Sagargad with maximum height of 390 m. An offshoot of Sagargad extends westward and truncates at Veshvi near Alibag.

Extensive mud flats are seen between Kihim and Alibag on the northern side and between Nagaon and Revdanda on the southern side.

The geology of the area is very simple as its major portion is covered with Deccan Trap of Cretaceous Palaeocene age. The basalts are dark black to ashy gray in colour. The lava flows are of extensive horizontal layers. The weathering imparts, step-like geomorphic features to the hill slopes with flat plateaux at their tops. The Kanakeshwar plateau is made up of laterite which is a residual weathering product of the basalts. The laterite profile is 8-10 m thick with massive ferruginous laterite having a thickness of 3-4 m underlined by lithomargic clays of 5-6 m thick. It rests on the weathered basalt. As observed around Kanakeshwar temple,

the laterite is sometimes rich in aluminium-producing low grade bauxite deposits. These rocks are reddish to reddish yellow or brown in colour with a number of vermicular and tubular cavities. When freshly cut, these rocks are bright red in colour and soft.

Upon disintegration, the trap produces greyish or dirty green murum which on further decomposition forms rich, fertile, reddish brown to black soil. The laterite, upon disintegration, produces dusty, reddish brown soil.

In the coastal tract, the traps are unconformably overlain by the Quaternary marine sediments. This rock sequence is presently being studied in the Geology and Palaeontology Department of M.A.C.S. The sequence has been called as the Raigad Group. The lower member is a conglomerate followed by mudstone while the upper portion consists of shell-limestone. The mudstone is exposed at Nagaon and Revadanda. The shelly limestone (locally called Karal) is extensively developed along the coastal tract. The entire Raigad group is believed to have thickness, less than 15 m. The shell-limestone is a porous rock and thus forms a good aquifer. The coconut and betelnut plantations, therefore, grow luxuriantly on these rocks. The sequence is overlain by the recent beach sands.

Marshland is seen developed in the coastal tract

from Revadanda to about 5 km north and also in the area between Surai to Akshi and Alibag.

2.3 Topography

The area under investigation can roughly be divided into three sectors so far as its topography is concerned. These sectors are the coastal line, the westward projections of Sahyadrian ranges forming a huge wall, and in between the two lies a narrow belt of land of uneven plains. There are no major rivers flowing through this area but on its northern end river Amba meets the Arabian Sea at Dharamtar Creek, while its southern boundary is flanked by the river Kundalika.

Only three small streams drain westward and meet the Arabian Sea. The Avas stream, about 13 km north of Alibag, the Sakhar, about 13 km north-west of Alibag and the Varsoli about 3.2 km north of Alibag.

The hills running north-south are approximately in the center of Alibag Taluka. They are not continuous as such. The Kanakeshwar Hills towards the north are separated from Sagargad range in the south-east section. Siddheshwar is located in the Sagargad range. Karli pass is also in the Sagargad range.

These hills form the resting wall and also the

eastern boundary of the area under investigation. The elevations (Kanakeshwar approx. 380 m, Sagargad approx, 400 m.) are not conspicuously prominent if the Sahyadri Range as a whole is taken into consideration. But, their position, just in the vicinity of the coastal line make them unique.

2.4 Climatology

The climatic changes are responsible for the division of the year into roughly four seasons.

Rains	:June to early October
Damp & hot weather	:Late October and November
Cold weather	:December to March
Dry and hot weather	:April and May.

The climate is the typical coastal climate with its own characteristics like heavy downpour during the monsoon, high humidity throughout the year and damp weather during the hot months.

The month of May is the hottest, the extreme maximum temperature (being) 33.7°C and extreme minimum temperature 26.4°C. January on the other hand is the coldest month, with extreme maximum temperature 32.1°C and extreme minimum temperature 14.3°C. (Table No. 1).

The relative humidity and vapour pressure seems to

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The relative humidity and vapour pressure seems to

be having maximum values in July and minimum values in January (Table No.2.1 : Graph No. 2.1).

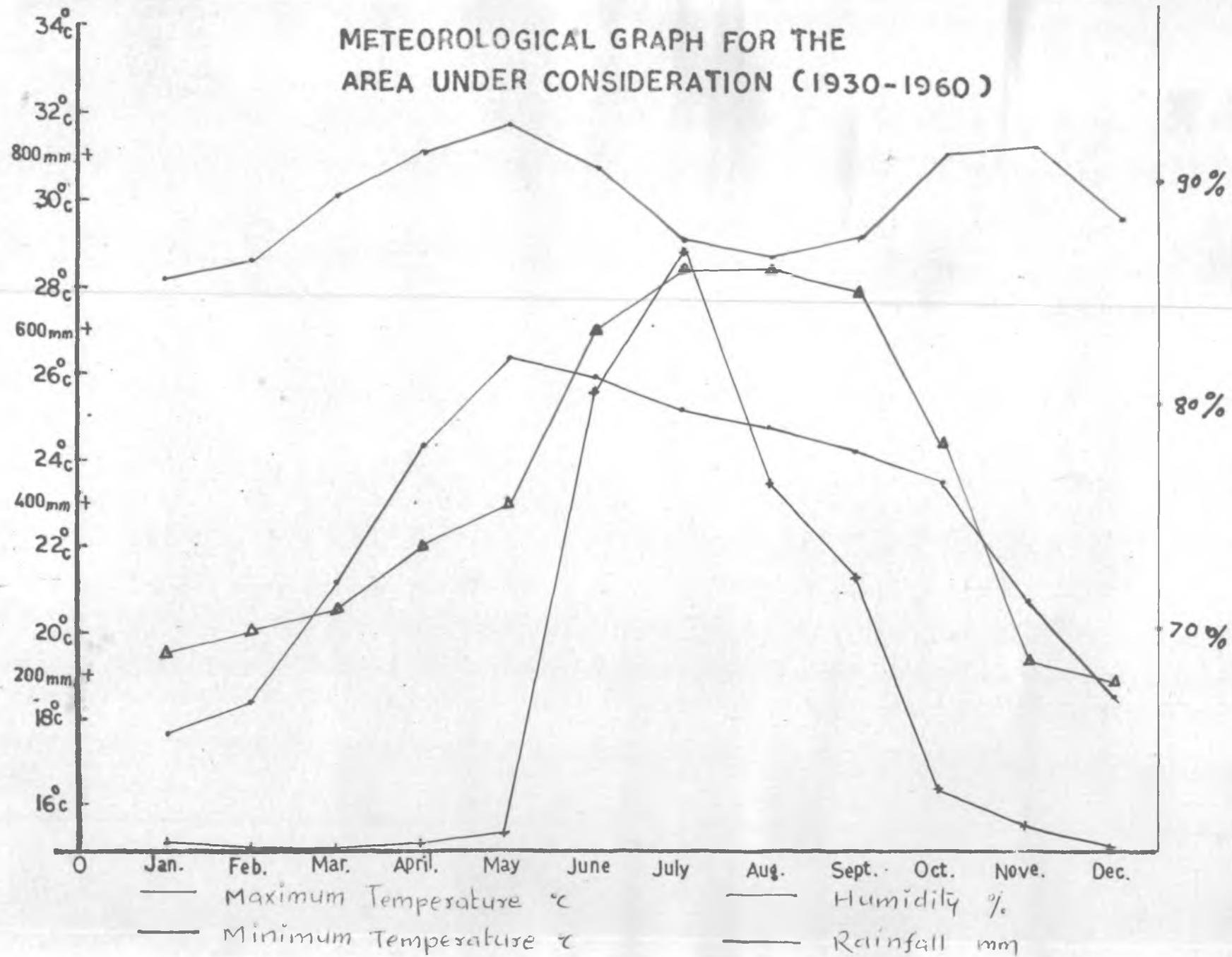
Table No. 2.1 : Climatological Data

Month	Air Temperature		Humidity		Mean wind speed
	Mean of Daily Max.	Daily Min.	Relative humidity	Vapour Pressure	
	°C	°C	%	mb	km p.h.
January	28.2	17.7	69	16.8	6.4
February	28.6	18.4	70	18.0	7.6
March	30.1	21.2	71	21.9	8.7
April	31.1	24.2	74	27.6	10.5
May	31.8	26.4	76	31.0	13.0
June	30.8	26.0	84	32.5	20.1
July	29.2	25.3	87	32.0	28.8
August	28.8	24.9	87	30.8	24.3
September	29.2	24.4	86	29.7	13.7
October	31.2	23.6	79	27.4	7.2
November	31.3	20.9	69	21.5	6.1
December	29.7	18.7	68	17.8	6.0

(Data collected from the Meteorological Department of the Government of India, Pune.)

At the end of May, large masses of clouds gather and pile over the western horizon. Pre-monsoon rains begin by the end of May. These showers are generally evening showers, rains bursting with heavy thunderstorms. The south-west monsoon commences in the first week of June. The air becomes cool and fresh. The downpour continues

Graph 2-1



till the end of September. Throughout the monsoon the sky is cloudy, the air is cool and fresh, sometimes from damp steamy to almost cold. July received the maximum precipitation as much as 1096.5 mm in 1977 and 29 rainy days (RD). The highest record of daily downpour is 302.5 mm on 26th September 1979 (Table No. 2.2 : Graph No. 2.2).

In early October, the south-west winds cease and rain stops. For some time, the clouds hang on and occasionally because of the eastern winds, there are thunderstorms. This climate seems to be the worst of the year.

By the beginning of November the climatic conditions are pleasant. The nights are long, mornings are cool, and in the afternoon there are pleasant sea breezes. December-January and February are the cool months, with clear nights and heavy dew. During the cold season occasionally there are cloudy days with, still, warm nights.

The meteorological laboratory is located at Alibag and the above mentioned climatological records are available at this coastal station.

At the higher altitudes like Kanakeshwar Hills, Karli Khind and Siddheshwar, one can predict higher precipitation and more humid conditions. The weather is much cooler and not sultry as it is at the shore lines.

Table No. 2.2 : Annual Rainfall (in mm)

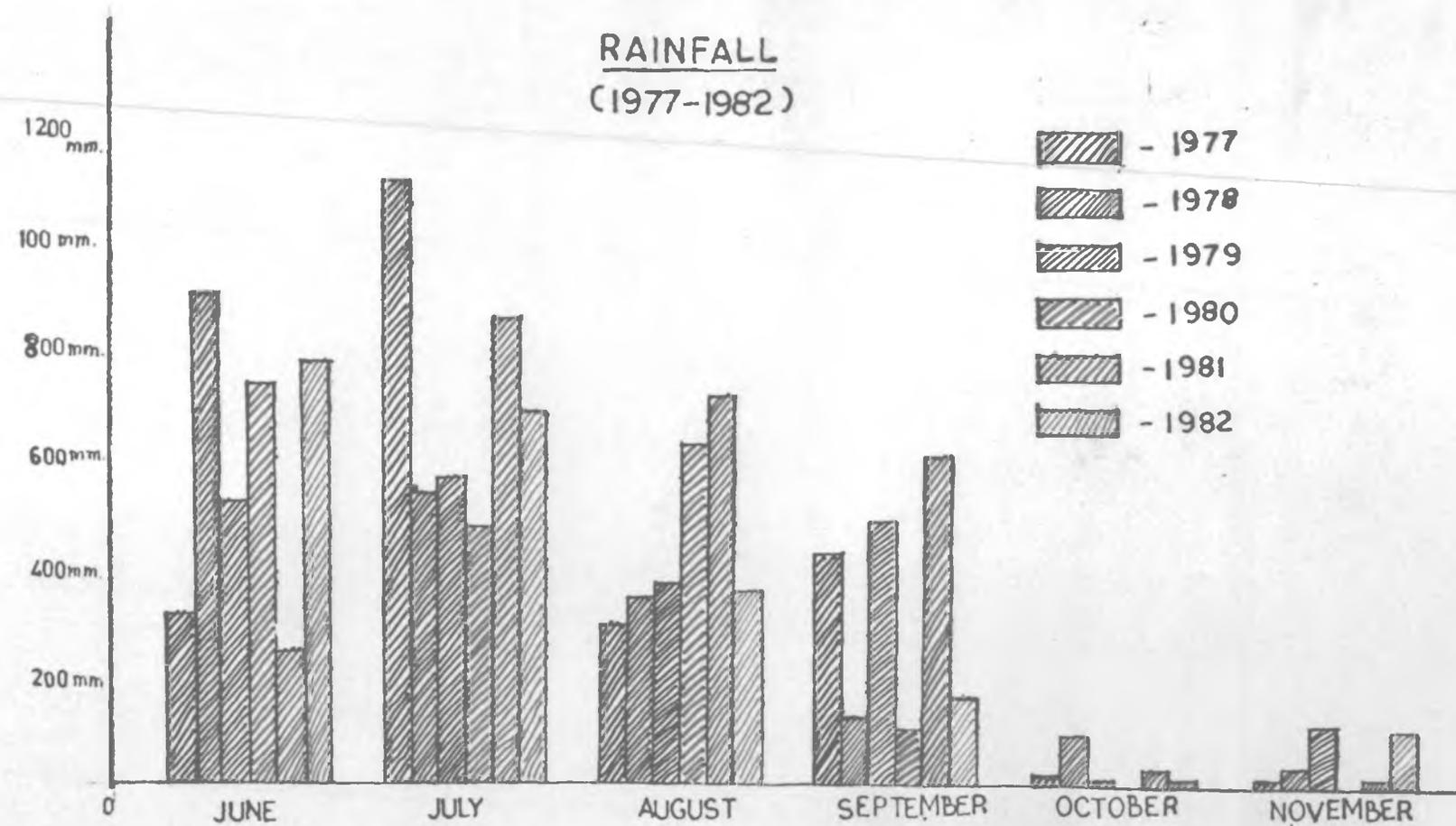
Month	Years					
	1977	1978	1979	1980	1981	1982
January	0	0	0	0	0	0
February	0	0	3.4 (1)	0	0	0
March	0	0.7	0.5	0	0	0
April	0	0	0	2.0	0	0
May	0	58.2 (3)	0	0	0	0.6
June	317.7 (17)	898.0 (20)	518.3 (11)	727.0 (22)	242.9 (5)	769.6 (12)
July	1096.5 (29)	533.4 (24)	564.7 (19)	469.6 (16)	848.2 (26)	670.5 (19)
August	293.8 (18)	341.5 (22)	372.6 (18)	620.7 (24)	717.2 (21)	357.9 (17)
September	417.3 (10)	119.0 (14)	481.2 (9)	105.8 (6)	606.7 (14)	162.3 (12)
October	19.5 (2)	88.3 (4)	10.6 (1)	3.2 (1)	33.8 (3)	17.2 (1)
November	15.4 (3)	26.0 (4)	106.8 (5)	17	13.8 (2)	96.0 (3)
December	0	4.3 (1)	0	25.1 (2)	0	0

Rainy Day - day with rain of 2.5 mm or more.

Figures in the bracket indicate the rainy days.

(Data collected from the Meteorological Department of India, Pune.)

Graph 2.2



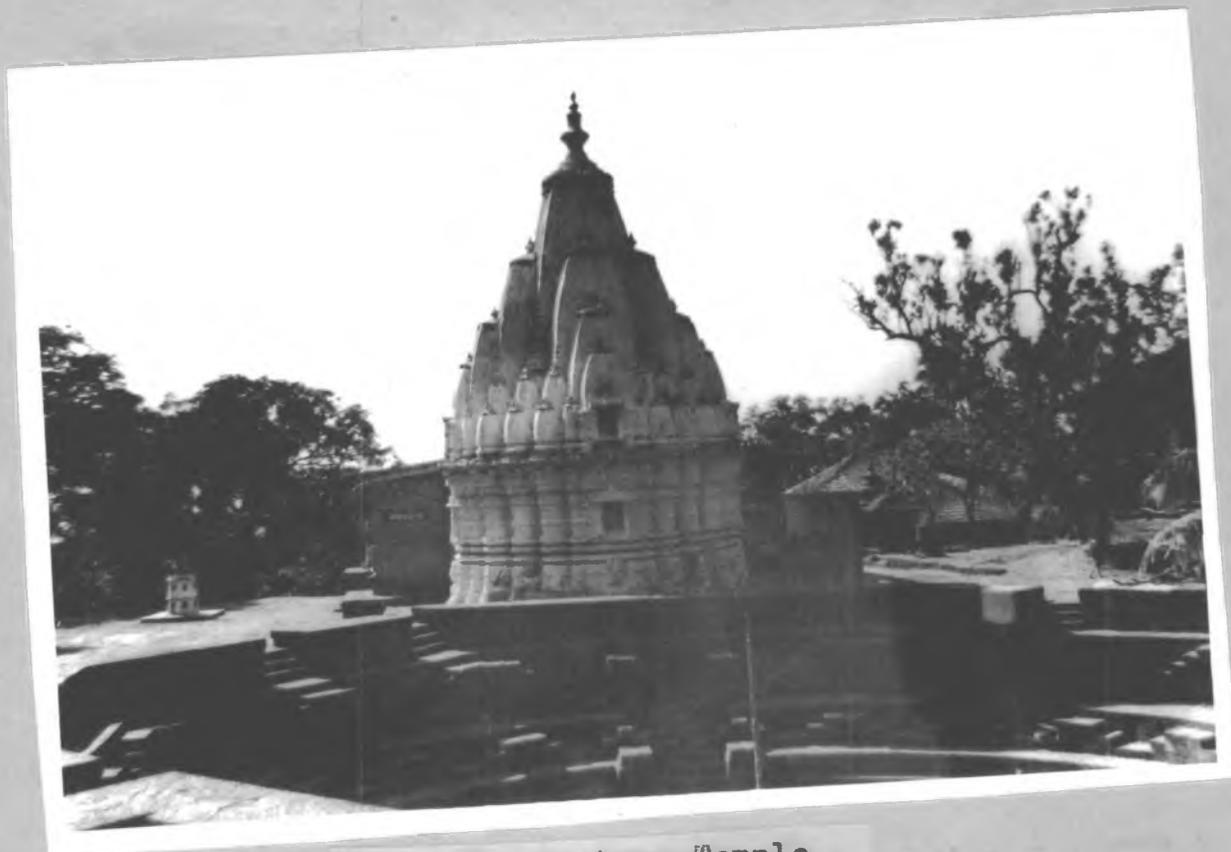
2.5 Kanakeshwar Hills

The hills are located at the distance of about 13km from Alibag towards north-east on Alibag Revas Road ($18^{\circ} 42' - 18^{\circ} 43' N.$ and $72^{\circ} 54' - 72^{\circ} 57' E.$) (Map 2). There are at least three to four approachable roads. One from Karli Khind located on Pen-Alibag Road, the others from Kanakeshwar Phata, or from Chondhi or from Zirad, all small villages on the way towards Revas.

Kanakeshwar Hills lie at about the distance of 8 km from the shore line. The plateau has Kanakeshwar Temple on its western face. The whole area of the plateau is approx. 8 km^2 . The maximum altitude is 388 m with Vyaghreshwar Temple as the highest point.

The isolated hill of the temple and the adjoining forest was a private property till recently and probably it was a sacred grove, quite extensive.

The place is a respected holy place because of the historic temple of Lord Shiv. Along with this temple there is a temple of Ganesh established in the last century. On account of these temples, the place is visited by a number of pilgrims many times during the year, especially in the months of "Shravan", "Kartik" and "Magh". Likewise, for nearby village schools it is a favourite picnic spot.



Shri Kanakeshwar Temple
abode of God of the area.

Located in the backyards of the shrine of Kanakeshwar are a few quarters for "Gurav" and "Pujari" of God and "Dharmashalas" for pilgrims to halt for a day or two, away from city life and to enjoy pleasant sea breezes by resting in the green woods.

The south-east approach is the easy climb that starts near the village Mapgaon. In the beginning, there are regular broad and short steps, later on the slope becomes steeper and hence difficult. There are no trees except for few stunted banyan trees that have grown in one sided fashion due to wind action. In the monsoon period, the surrounding slopes become velvety green due to grass cover. One can take rest on the steps while climbing and have a look at the shimmering seas, two islands "Khanderi" and "Underi", and far towards north the sky scrapers of Bombay in a misty environ. And now the work in progress for Thal Vayshet Project.

In the last stage the slope becomes steeper. It then takes a sharp turn in the north east direction and one enters a thick, wooded green patch. At this entry point there is Cow's Seat or "Gaymandi". The jungle path is now flanked with steep slopes forest covered on its eastern face. Passing by the small temple of "Paleshwar", and a pond called "Ram tirth" the gentle slope takes you to a

shallow ditch - the shrine of Kanakeshwar with a large pond to its rear. On the outskirts of the temple and the pond are the hutments of the residents few in number.

The Kanakeshwar temple is of Hemadpanti Style, star-like, having many corners, possibly of the 11th century. The foundation of the shrine is of black stone and the spire is white-washed. The three main faces are enriched with niches for images. Between the three main faces, each wall is built with five corners. At the top of each corner there is a figure of a monkey and under the eave is a figure of a seated yogi. On the south face in the spire niche are the figures of Brahma with Savitri, in the upper shrine niche figure of Bhairav and in the lower shrine niche Gayatri on a pair of elephants. On the east face in the spire niche is Shiv, in the upper shrine niche is Bhairav and in the lower shrine niche Savitri on elephants. On the north face in the spire niche is the figure of Vishnu, in the upper shrine niche Bhairav and in the lower shrine niche is Saraswati on elephants.

The lines of the corners between the faces are carried up beyond the heavy eaves into pointed panels present in sets of three, each ending in a round "avla" berry and a stoppered water pot.

The "mandap" of the shrine to the west is modern

built in 1960. It leads to the main temple. Through the doorway, six steps lead down into sanctum sanctorum, the "Salunkha" about a meter in length, shaded by a five-hooded brass cobra. (Plate No.2.1).

2.6. Other collection sites
referred in the text

1. Akshi - A small village located to the south of Alibag at 5 km on the sea-shore on Alibag-Revdanda road with its Casuarina plantation.

2. Alibag - The District place for Raigad District. Placed at the mouth of a tidal creek - the Sakhar Creek. To the south  west of Alibag is the sea-fort about half a kilometer from the shore with some ruined buildings and temples.

Right on the shore in the north-west corner is the Observatory which collects basic data in Geophysics connected with the field of magnetism, particularly the forecasting of magnetic storms.

3. Ceul - Also known as Revdanda, lies to the south of Alibag (about 12 kms). It is the place of great antiquity located on the north bank of Kundalika river. Ceul has a huge, ruined castle of Portuguese times. The fort has many lanes and pathways, tall gates in stone walls all of which are now infested with many lofty species of Ficus.

In the southwest corner is a massive ruined tower of St. Barbara, about 16 m. tall. It is a seven storied building, representing the remains of the fortified church of 1577 A.D.

Alibag Revdanda road goes beyond Ceul, takes an eastward turn to Bhavale lake and then reaches Ceul Hills, having the shrine of Dattatraya on its eastern spur. The hills have extremely narrow dimensions.

4. Karli pass - Located on Pen-Alibag road in the Sagargad Range, towards the north-east.

5. Khandala - A small village at the foot of Karli pass - turn for Siddheshwar Hill.

6. Kihim - A large village of scattered houses hidden in the woods; about 10 km north of Alibag on the sandy beach.

7. Mapgaon - A small village at the foot of Kanakeshwar Hills.

8. Nagaon - A coastal village about 7 km to south-east of Alibag hidden in palms. Extensive Casuarina plantation carried out by the Forest Department, Maharashtra State.

9. Satad - A tiny coastal village lying next to Nagaon, visited for famous Hyphaene community.

10. Revas - A small village to the north of Alibag 22 km from Alibag, at the mouth of Revas Creek - an easy passage of about one and half hours towards Apollo Bunder of Bombay.

11. Siddheshwar - A tiny hill nearer to Sagargad, about 6 km from the village Khandala. A small temple of Mahadev surrounded by 2-3 hutments.