

CHAPTER 2

STUDY AREA

Yashwant Lake is located on Toranmal Plateau, one of the important plateaus in mid Satpura. This plateau forms a table land on the summit, covering about 41 Sq.Km. area at 1155 meter altitude (AMSL) extending between 21° 54' North to 21° 61' latitude and 74° 26' to 74° 34' East longitude. With its extensive historical background as the capital of King Yuvanashav during Mahabharata period, it is a pre-eminent hill station and famous tourist spot in the North Western Maharashtra. It is situated 140 Km. North of Dhule, and 90 Kms East of Nandurbar, the district capitals of Maharashtra. Toranmal plateau is a quantum part of Satpura mountains forming the cultural transition with its trijunctional location between Maharashtra, Madhya Pradesh and Gujarat. Because of remoteness and inaccessibility, it is almost neglected and has remained as an isolated ecosystem. Hence, the attention of Environmentalists, Naturalists, Geographers, Ecologists, Geomorphologists and Biologists is required to identify its environment with biodiversity and scenic beauty. Located on a horst block between Narmada graben on north and Tapi in the south it is surrounded by many small residual hills with local relief of about 30 to 40 meters, surrounded by the plateau from all sides.

Yashwant lake has a perimeter of 2.75 Km. and spreads in 39 hectares. It was constructed during British period by damming the dip gorge. The gravel embankment around 400m on the north east side arrests the main flow of the stream.

Location Grid of Yashwant Lake

Boundary	Latitude	Longitude
East	21° 52' 54''	74° 27' 43''
West	21° 52' 50''	74° 27' 21''
North	21° 53' 08''	74° 27' 30''
South	21° 52' 39''	74° 27' 33''

The littoral zone of Yashwant Lake is covered with various macrophytes. The Lake on the west and northwest is surrounded by forested land, whereas Rest houses of Maharashtra Tourism Development Corporation (MTDC) and tourist cottages of Public Welfare Department (PWD and Forest department) are present on the north side of the Lake. The Toranmal village is present on its eastern bank with its linear pattern settlement of tribal people across the road. The main drainage inflow of water enters the Lake from southern bank and minor drainages from Northwest. The outflow (spillway) of the Lake is located on eastern side near a temple. The water runs downwards upto a fall known as Sitakhai forming a small reservoir (Lotus Lake) a kilometer away.

The Yashwant Lake is a perennial water body. Hydrological changes are noted here with seasonal changes from dry to wet. The southwest monsoon starts by mid June and stabilizes in July and August. The stream drainage input fills the Lake and maximum water level as well as water cover are achieved at Yashwant Lake by the post monsoon (Sept – Oct. period). Water level decreases in summer due to evaporation, percolation and domestic utilization by villagers. The inflow of drainage in monsoon carries soil which is deposited on southern and western bank of the lake which has become shallow and rather muddy which is taken as site-C (YLC) in present study. Large number of macrophytes grows in this fertile soil with shallow water. The eastern bank of the Lake is rocky with sandy stretches which does not sustain macrophytes well. The eastern bank is used by the tribals for their domestic activities which is taken as site-A(YLA) in present study. Occasionally, large holy assemblage of about 50 to 80 thousand people also take place here. Northern bank is partly having gravel embankment of 400 m and partly a shore with clay bottom that supports variety of trees. Vegetation of littoral area consists of an almost closed canopy of small to medium sized trees, herbaceous plants (Plate No.6) and floating vegetation. As this bank is inundated seasonally, due to the turbidity and the seasonal fluctuations in water levels as well as water cover submerged aquatic macrophytes are less on this side. North West side of the

lake is having clay bottom with variety of trees and vegetation which is taken as site-B (YLB) in present study.

Physical Environment

Administratively, Yashwant Lake is a part of Dhadgaon Tahsil (which is located in Satpura range) of Nandurbar District of Maharashtra. Geologically, the area covers Deccan trap basalt rock formation and lies under monsoon semiarid deciduous forest cover. Its soil has characteristic influence of temperature and rainfall. It falls in the Maharashtra State Forest Department Range Head Quarters of Ranipur Forest division, North Dhule, with Head Quarter under Shahada Forest Circle, Dhule.

Landform

Toranmal plateau is confined by the escarpment from all the sides that can be grouped as Northern, Southern, Eastern and Western escarpment forming an inseparable land of the plateau. The waterfalls and gorges (e.g. Sitakhai and Kalapani respectively) are the associated landforms of the escarpments. They also create the variety of landforms like depressions, cave, outlier hills, etc.

The plateau and hill station are known as Toranmal plateau after the abundance of 'Tuwar' plants (*Cajanus cajanus*) and the presence of Torana Temple (Goddess of tribals). After the formation of Maharashtra State, the plateau was visited by the then Chief Minister of Maharashtra Mr. Yashwantrao Chavan. The Lake was named after his first visit as Yashwant Lake in the year 1959. Then it became a hill station. Accessibility of Toranmal is mainly by the State Transport. However, it is moterable except in monsoon.

Table: 2.1 Monthly Averages of Temperature and Rain fall (1975-2005)**Station-Dhadgaon**

Month	No. of Rainy Days	Mean Rainfall	Temperature		Mean Daily
			Max.	Min.	
Jan	3	7	25.5	11.7	18.6
Feb	-	-	28	13.5	20.7
Mar	-	-	32.9	17.4	25.1
Apr	-	2	36.6	20.4	28.5
May	-	25	36.8	20.9	28.8
Jun	7	128	26.1	18.6	22.3
Jul	17	352	35.1	18.9	27.6
Aug	11	167	25.1	16.1	20.6
Sep	16	321	26.4	15.9	21.1
Oct	3	278	29.8	24.8	27.3
Nov	-	7	28.3	11.6	19.9
Dec	-	-	26.5	11.7	19.1
Annual	54	1287	29.7	16.8	23.2

Source: Stastical Department, Agricultural College, Dhule and Nandurbar district (Adayalkar, 2006).

Bio-climatic Conditions

The ecological profile of the Toranmal plateau hinges on the bio-climatic conditions of the region. As the climatic data of the region is not available, the climatic conditions are determined on the basis of temperature and rainfall data from the nearby stations like Dhadgaon, Shahada and Nandurbar. However, on the basis of adiabatic lapse rate ($6.5^{\circ}\text{C}/1000\text{m}$) data has been generated. Toranmal plateau does not experience frost or snow, but the temperature and rainfall constitute the principal component of its climate. Plateau area is covered by deciduous forest and the temperature is cooled down under altitudinal effects. Besides, the strong and steady breeze across the Lake adds the chilled pleasantness. However, during mid summer, the mean maximum temperature hardly reaches upto 25°C . Nevertheless, the mercury occasionally

touches 35 °C in the months of April and May. Soon after, the climate turns into a pleasant afternoon or evening. Generally, from the end of the February temperature start increasing steadily and stabilizes by the end of May or the first week of June. The mean daily range of temperature is high in this period. This is a period of hot and dry winds and intense heat. In the wet season the rainfall is torrential and some time it falls in the form of heavy down pour as to make visibility very poor. Annual rainfall exceeds above 1696.2 mm which again reduces the summer hotness. It is evident that the Toranmal plateau is never too hot and it is pleasantly comfortable all the year round. The overall climate of Toranmal plateau merits it as an important hill station of Maharashtra. Record of rainfall for Nandurbar station is availed in gazetteer (The mean annual rainfall was 937 mm from 1975 to 2005 Table: 2.1). As Toranmal is located in Dhadgaon Tahsil about 40 Km aerial distance away from Dhadgaon Taluka head quarters, it is assumed to have similar climate conditions. Meteorological data from Dhadgaon is utilized to analyse the weather conditions of Toranmal. The thirty years data of Dhadgaon shows mean average rainfall of 1287 mm and daily mean temperature fluctuations between 16.8 to 29.7 °C.

Plate No - 1
Location Map of Study Area

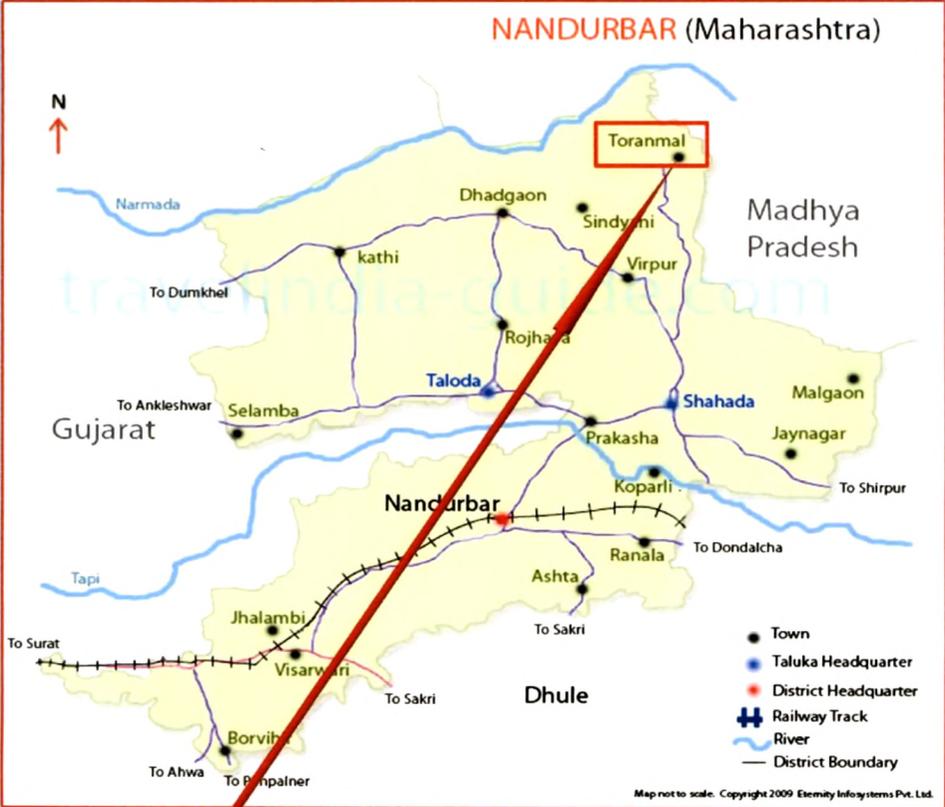
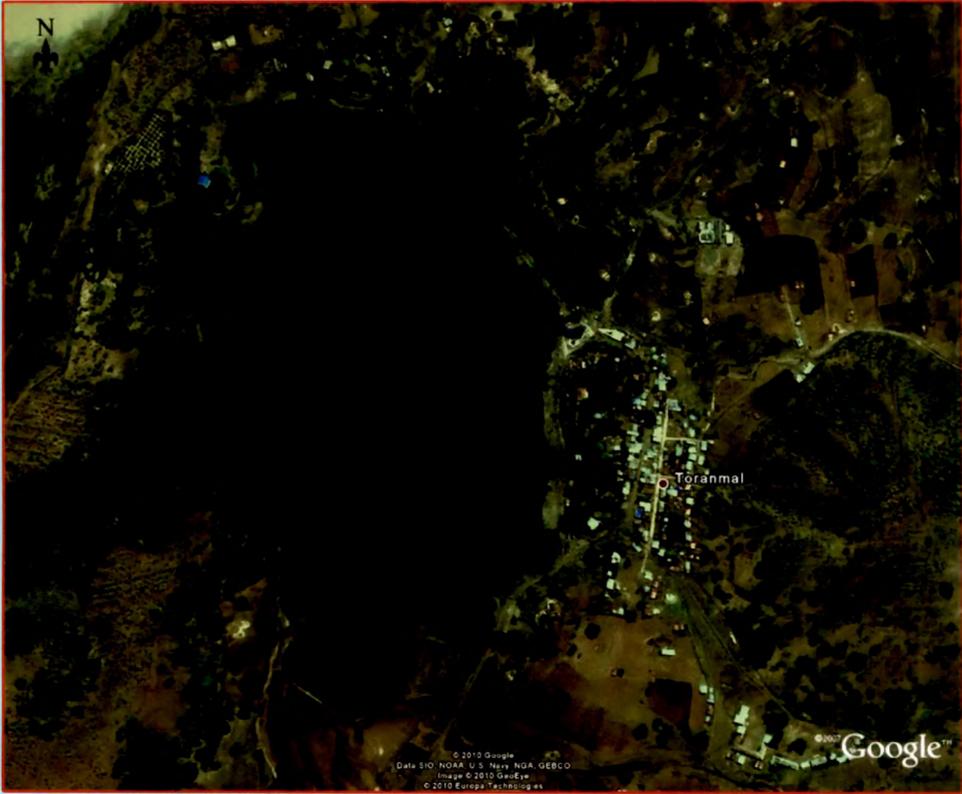


Plate No - 2
Satellite Picture of Yashwant Lake at Toranmal



Yashwant Lake at Toranmal - Panoramic View



Plate No - 3

Station - A. Washing and Bathing Activities at Yashwant Lake



Station - A. Water Cover Reducing During Summer



Plate No - 4

Station - B. Growing Vegetation During Postmonsoon



Station - B. Yashwant Lake at Toranmal - Panoramic View



Plate No - 5

Station - C. Yashwant Lake at Toranmal - Panoramic View



Station - C. Yashwant Lake at Toranmal - Panoramic View



Plate No - 6
Macrophytes With High Water Level During Monsoon



Gastropod Shells in Exposed Sand During Summer, Station - A

