CHAPTER 2
DESCRIPTION OF STUDY AREA

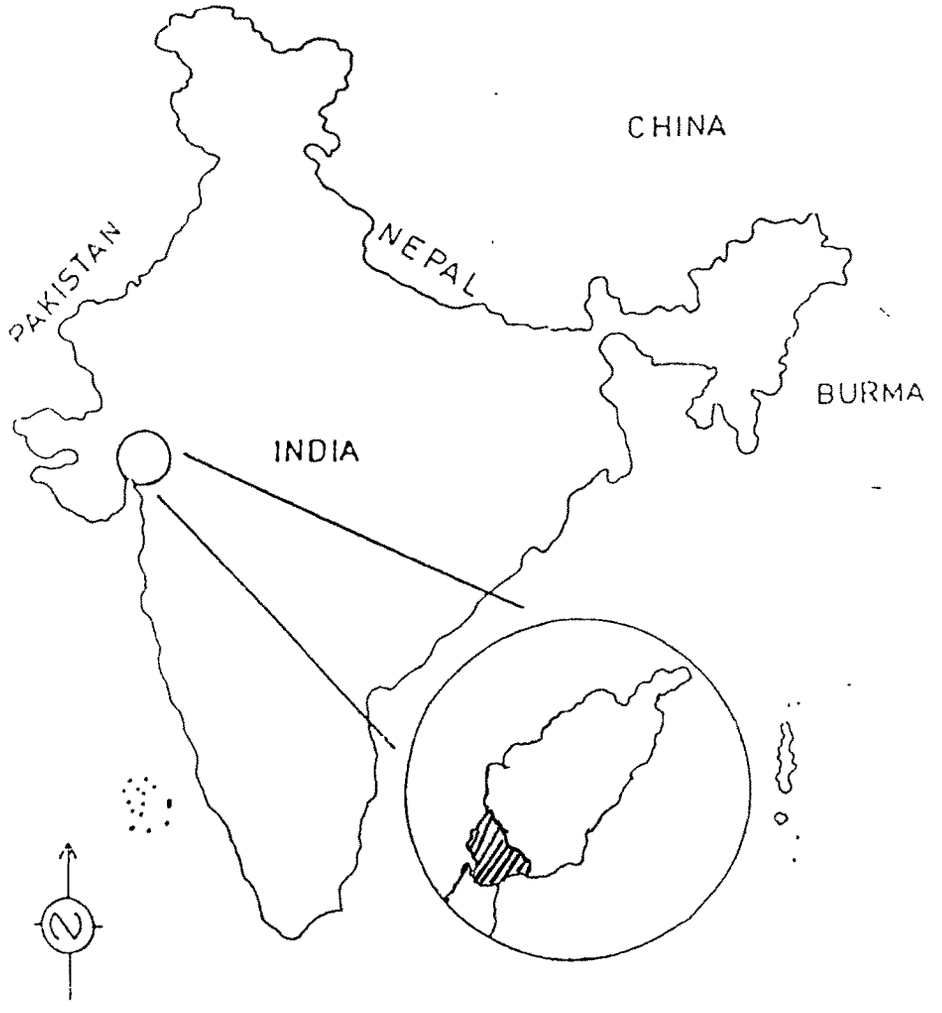

Fig.5.. Study Area.

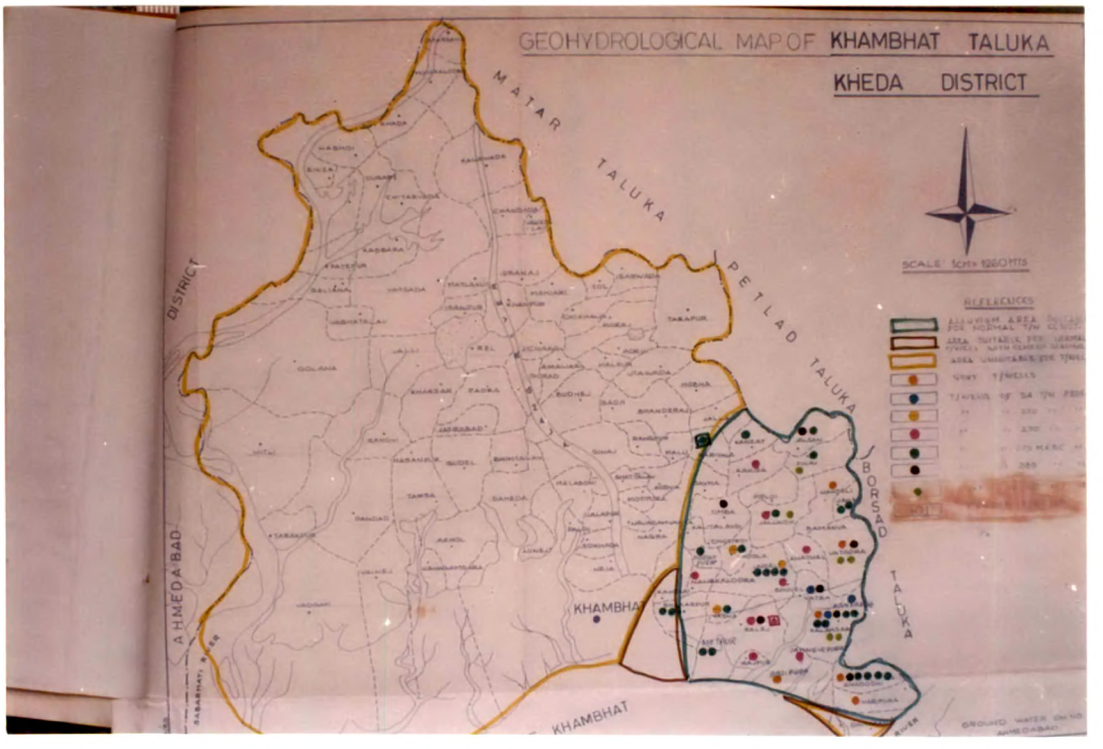

Plate 1- Hydrogeological map- Khambhat taluka with village names.

DESCRIPTION OF STUDY AREA

Khambhat taluka consists of 101 villages (Plate.1) lies in the south of Kheda district in central Gujarat. Between 22° 15' and 22° 38' north latitudes and 72° 25' and 72° 45' east longitudes covering an area of 110,960 ha with the landuse pattern as follows,

Geographical	57,540 ha
Culturable	24,426 ha
Culturable waste	2,995 ha
Unculturable	33,114 ha
Net cropping	21,431 ha
Double cropped	3,275 ha
Gross cropped	24,706 ha

(Soil survey division, vadodara 1985)

AGROCLIMATE OF GUJARAT :

Since the management of land and water resources is intimately linked with the agroclimatic conditions, the deep knowledge about this is considered a immense importance for the scope of the study.

SOILS

The soil in Khambhat taluka is very deep, about 90 cm, well drained to imperfectly drained, non calcareous to calcareous, moderately fine to fine textured, occuring on nearly level to flat land with the physiographic position of midland to low land. The texture of the soil varies in different places as sandy loam, sandy clay loam, clay loam and clay, with the infiltration rate of 0.04 to 1.50 cm/hr.

CLIMATE

Subtropical with comparatively dry climate. Summer is generally very hot with a cold dry winter. The average temperature for the years 1975 to 1988 ranged between 15 to 45 °c (soil survey division. Vadodara,1985)

RAINFALL

The average rainfall varies from less than 500 to 800 mm. The yearwise rainfall of this taluka from 1975 to 1985 has been found to be ranging between 633 mm and 1537 mm with the exception of 1980. About 95 percent of the rainfall occures during the south westerly monsoon period ie from June to September. Neither the on set nor the withdrawl of the monsoon confirms to any consistant or predictable pattern. Although the monsoon normally sets in by the third week of June, sometimes it may not be so till the second week of July and in some years it may suddenly withdraw in early September. The year of 1986 and 1987 is considered as drought year due to negligible amount of rainfall during the period.

WATER RESOURCES OF KHAMBHAT TALUKA

The main resources of water in the state comprises of surface water and ground water. Dugwells and tubewells are used for water management. The hydrological data collected from Gujarat Water Resources Development Corporation Ltd. Govt. of Gujarat is given in the table.2

Table:2 Hydrogeological data of Khambhat taluka.

Item	1979	1985
1.Total Geographic area in sq.km	1194.8	1194.8
2.Alluvial area in sq. km	1194.8	205.00
3.Hard rock area in sq. km	Nil	Nil
4.Saline area in sq. km	955.84	898.8
5.Net suitable area sq. km	238.96	205.0
6.Average rainfall in mm/year	985.98	855.98
7.Gross recharge in mcm/year	130.25	69.75
8.Total draft in mcm/year	26.72	13.96
9.Net draft in mcm/year	18.70	9.77
10.Potential availability mcm/year	72.47	49.26
11.Est. Fractional recharge represented by existing draft in %	20.51	11.04
Irrigation through canal	?	?

(2) do in one it decreased?

(5) What suitable

What about irrigation through canals? (MFPC)

IRRIGATION POTENTIAL

The Khambhat Taluka is one of the seven talukas of MRBC (Mahi Right Bank Canal) command area that forms a part of alluvial basin in Central Gujarat. The thickness of alluvium is comparatively less in the eastern portions, becoming more towards the gulf of Khambhat. The area was brought under canal irrigation since 1959 through a pickup weir at Wanakbori. A construction of Kadana reservoir in 1976 has supplemented the irrigation further which is now possible through out the year. The MRBC upto 1981-1982 had a potential of 355955 ha in the command. An area of 228177 ha. was irrigated as against the potential of 355955 ha.. Thus the irrigation intensity achieved during 1981-82 worked out to 64.08 percent (Kalubarmae et al 1983). Five different types of irrigability classes were adopted in Khambhat Taluka as shown in irrigability map of MRBC command area (fig. 6).

AGRICULTURE :

Agriculture is being carried out on the suitability of the land for perinnial or seasonal (Rabi & Kharif) either of two or one. The crop grown here are Rice (Oryza sativa L), Bajri (Pennisetum typhoides (Burmf) Stapf & Hubb) Juwar (Sorghum vulgare Pers.), Kodri (Paspalum serobiculatum. L. var. Longifolium (Roxb.) Dom. and fodder grass in kharif season and oil seeds like mustard (Brassica juncea (L) coss.), wheat (Triticum aestivum .L) vegetables, spices Rajgiro (Amaranthus hybridus L. supsp. cruentus (L). Thell. var.) and pulses in the Rabi season. Cotton (Gossypium arboreum. L.) Tobacco

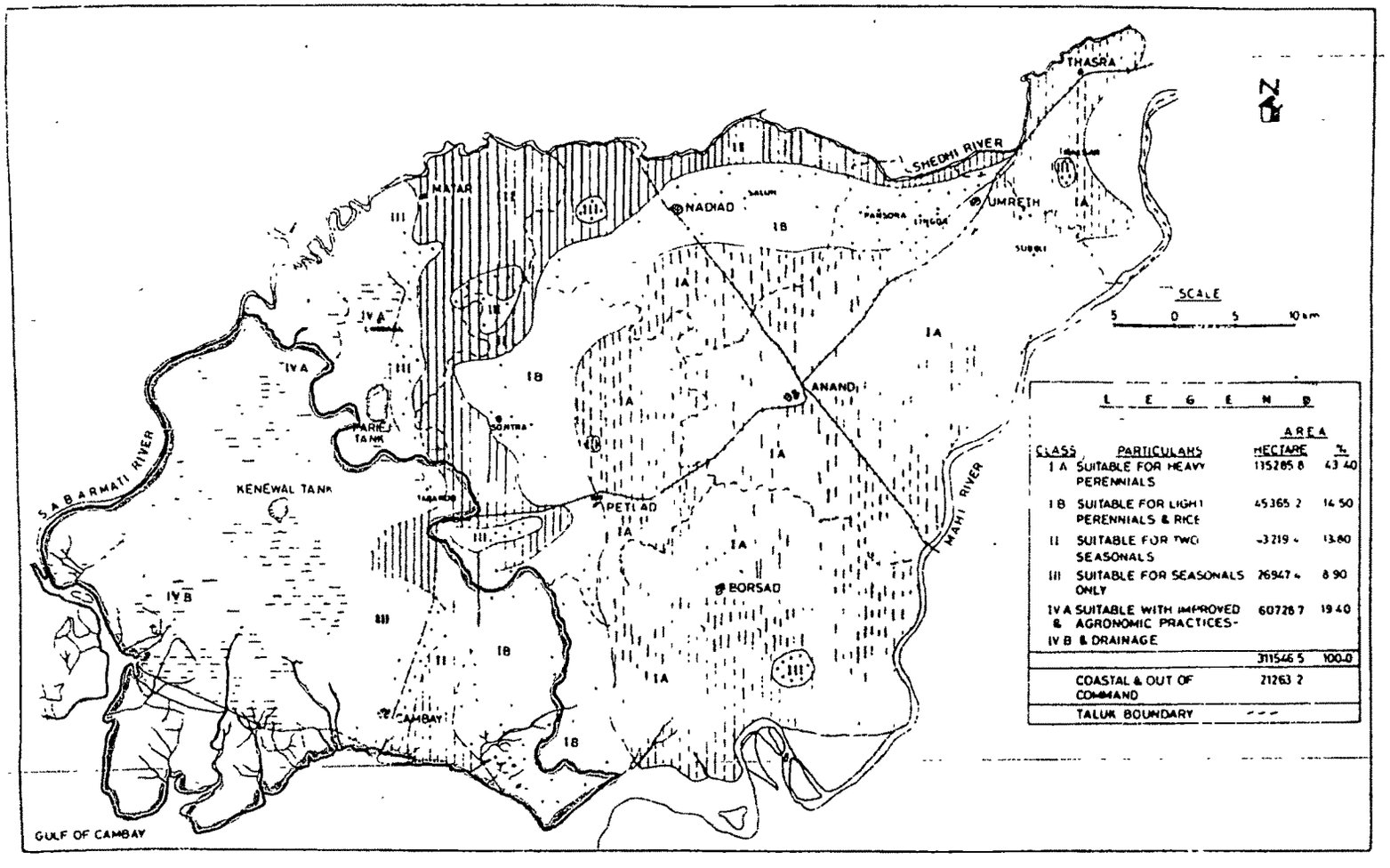

Fig. 6 Land irrigability classification map of the Mahi right bank canal command area

(Nicotiana tabacum L.) Tuvar (Cajanus cajan L.) are grown as two seasonal or perinnial crops (Personal observation). The distribution of land for different crop cultivation in Kheda district, according to the agriculture officer is given below,

Total land under cultivation:	2,52,100 ha.
Cultivation under paddy	1,35,000 ha.
Cultivation under bajri	96,700 ha.
Tur, adad, Math etc.	21,500 ha.
Tobacco	80,000 ha.

(Times of India, June26, 1991)

MAJOR CONSTRIENTS OF THE AREA:

With the introduction of irrigation system in 1959, the natural existing hydrological balance is disturbed in this taluka. The observation of subsoil Watertable taken by the Irrigation Department Gujarat showed the fluctuation in water level of Kheda district as.

Year	1984 May	1985 May	1986 May	1987 May
Water level fluctuations in meters.	11.62	12.31	13.49	14.66

(Hydrological data of Gujarat state GWRD Gandhi nagar)

Seepage from irrigation canals and water courses and the deep percolation from application of large doses of irrigation particularly in rapid cultivation of paddy, cause the ground water level to rise. It has been found that the water table in

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the MRBC command has risen at a rate of 0.375 m/year in clayey soils and 0.76 m/year in the sandy loam soils. (Kalubarme et al 1983.), (Plate 2,3) which ultimately led to waterlogging and salinization of lands. Out of a total area of 1194.8 Km^2 Khambhat taluka has 362.3 Km^2 land damaged by salinity. By using modern Satellite Remote Sensing technology, it has been observed that 6,937 ha. of land was degraded by salinity in the year 1975 and 36,281 ha. of land has become saline in the year 1986. Thus sporadic spread of the degradation of the agricultural lands is very evident in this taluka, due to the improper management of water in irrigation system of MRBC and a waterbody Kenewal tank. (plates 4,5).

Plate 2 Water table raised to the soil surface.

Plate 3 Salinization due to the evoporation.

Plate 4- MRBC - Irrigation canal

Plate 5- Kenewal water tank.