

# **Chapter 6**

## **Matar Command**

## **PART II**

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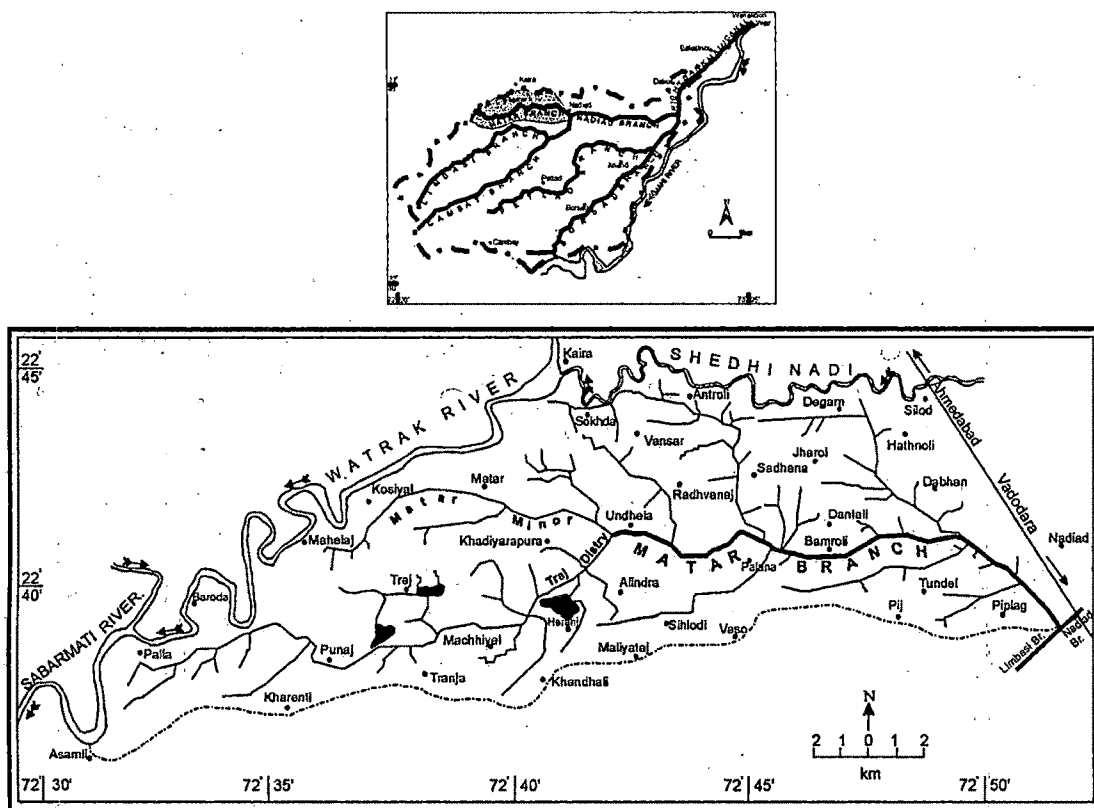
As discussed in the previous chapters, introduction of canal irrigation in MRBC command area has not only resulted in the positive impacts i.e. green revolution but also the negative impacts like waterlogging, water quality deterioration and soil salinization and/or alkalization. It is an established fact that the study at the smaller scale gives the better idea about the causes and its remedies against the problem and to minimize the effect. Therefore, an author has selected the Matar Branch command area to study the probable reasons, for the deteriorating effect of the canal irrigation on groundwater and soil regimes.

#### **LOCATION AND EXTENT**

Originating near Piplag, the Matar Branch command area occupies the western most portion and northern periphery of MRBC command. The command area encompasses part of Nadiad (15 villages) and Matar (31 villages) Talukas. Geographically, the area lies between  $72^{\circ} 40' E$  to  $72^{\circ} 45' E$  longitude and  $22^{\circ} 40'$  to  $22^{\circ} 45' N$  latitude (Fig. 6.1) with the gross command area of 22,640 ha. However, the culturable command area remains 12,272 ha only. The Matar command area on its western and northern boundary is bounded by the rivers Sabarmati, Watrak and Shedhi and its southern boundary is shared by the Limbasi branch command area.

#### **TERRAIN CHARACTERISTICS**

The command area is situated at an elevation ranging between 36 and 17 m AMSL. The elevation has been extended within 33 kms, hence the area has a topographical gradient less than  $1^{\circ}$  and represented as an almost flat terrain. The overall topographical gradient is similar to that of regional trend i.e. southwesterly (toward the Gulf of Cambay). However, local variations in the slopes have been observed along the river valleys.



**Fig. 6.1 Location Map of Matar Command Area.**

The overall drainage of the command area constitutes a part of system Shedhi, Watrak and Sabarmati rivers, having their source from Pre-Cambrian terrain in upper reaches. The Shedhi river flows westerly, Watrak river south westerly and the Sabarmati southerly; with a strong controls of tectonic fractures. Despite the presence of major streams on command periphery, the command area lacks any significant drainage system. However, the study of satellite imagery shows distinct remnants of palaeo-channels of Watrak River. Taking the benefit of there linear depressions along the remnants of palaeochannels, there exists large number of ponds/irrigation tanks, constructed by various agencies. Few important ponds/tanks are located at Tranja, Traj are in fact used for irrigation purpose also.

## **GEOLOGY**

As it has been already been eluded in preceding chapter on Geology that the study area falls within the limits of Tarapur-Cambay Block of Cambay Graben. The entire area is characterised by a thick pile of alluvium of Recent to Sub-Recent time. The alluvium represents typical continental fluvial nature. However, the alluvium developed on the

western extremity under fluvio-marine condition, as well as aeolian types are more prevalent. This alluvium comprises admixture of clay-silt-sand with an aggregate thickness of more than 300 m.

## CLIMATE

The observed average annual rainfall in the study area is to the tune of 850 mm. It is the southwesterly prevalent between June and September with 42 rainy days. The area falls under the semi-arid climatic domain.

The temperature data available for last 15 years indicate maximum mean temperature of 38<sup>0</sup> C during summer and minimum mean temperature of 16<sup>0</sup> C during the January. Mean soil temperature is more than 22<sup>0</sup> C. Depending upon the temperature conditions the area falls under the Hyperthermic Regime and Ustic moisture regime.

Owing to favorable climatic conditions ample availability of the surface water, groundwater resources, and ideal soil condition have made land suitable for agricultural practices. A quantitative details on the observed landuse pattern in Matar Command area is as under.

Landuse Category*	Area ha.	Percentage
Gross Command Area (GCA)	22640	-
Culturable Area (CA)	19719	87.1 of GCA
Culturable Command Area (CCA)	12272	62.2 of CA
Unculturable Area	2921	12.9 of GCA
Culturable Waste Area	926	4.1 of GCA
Net Cropped Area	18911	95.9 of CA (83.5 of GCA)
Double Cropped Area	5127	26.0 of CA (22.6 of GCA)

(\* Landuse pattern based on year 2000 data).

Out of the total command area only 22.6% has been utilized for cropping in the Kharif and Rabi season. The village wise details on the land use pattern in the Matar Branch command area for the year 2000 is as given in the Table 6.1.

**Table 6.1 Village wise Landuse Pattern, Matar Branch Command of MRBC Area.**  
**Source: Taluka Panchayat, Nadiad. (Year: 2000)**

Village	Total Geographical Area	GCA	CCA	Area under Irrigation	Culturable Area	Unculturable Area	Culturable Waste	Net Cropped Area	Double crop Cropped Area	Gross Cropped Area
Hathnoli	293.13	105.42	54.72	17.51	254	39	2	252	127	279
Degam	838.09	681.47	578.66	171.34	789	34	74	715	197	912
Jharol	251.04	251.04	234.14	135.26	365	12	15	350	43	393
Dantali	603.30	964.43	469.24	277.39	542	61	5	537	154	691
Dhabahn	869.64	714.99	464.08	143.01	766	104	16	750	249	999
Dumral	417.91	137.33	92.81	14.60	403	16	3	400	121	521
Tundel	603.67	479.80	457.21	217.50	530	73	87	443	156	599
Pij	1717.41	242.11	259.51	95.58	1586	130	80	1506	81	1587
Davda	584.34	398.90	351.49	240.99	409	54	32	377	124	501
Bamroli	476.16	421.17	345.83	175.02	424	52	23	401	226	627
Palana	897.57	727.99	491.10	297.21	783	114	19	764	250	1014
Nadiad	4014.59	1964.04	1234.08	180.17						
Vaso	1115.00	39.83	38.93	21.19	979	176	17	962	397	1359
Matar	1566.49	1094.79	963.99	668.56	1261	302	25	1236	139	1375
Alindra	596.87	77.85	55.87	116.30	638	63	2	636	153	789
Sokhada	819.99	325.17	262.95	150.71	775	16	59	716	123	839
Vansar	454.26	342.93	268.02	140.51	391	58	28	363	201	564
Ratanpur	605.76	260.38	208.56	173.34	492	114	4	488	258	746
Antroli	566.08	457.63	330.77	195.29	521	64		521	118	639
Hajirabad	507.81	220.32	181.00	122.29	371	136	41	330	62	392
Sadhana	1122.82	906.14	493.55	374.98	921	47		921	336	1257
Raghvanaj	562.00	443.00	402.06	263.17	494	68	2	492	123	615
Undhela	743.46	522.28	494.33	324.38	665	78		665	245	910
Pipria	477.35	364.46	231.58	215.87	383	94	20	363	142	505
Koshiyal	376.65	175.71	165.62	138.95	306	70	13	293	103	396
Mahelaj	1430.51	700.02	399.25	270.11	1105	317	84	1021	107	1128
Traj	1519.57	1289.21	1123.13	956.02	1502	17		1502	350	1852
Garmala	766.48	124.34	440.57	431.28	488	76	30	458	155	613
Khadiarapura	144.55	136.50	121.99	102.11	125	19	21	104	29	133
Untai	219.55	190.32	121.21	105.71	197	23	4	193	128	321
Kathoda	331.32	279.49	175.79	48.27	168	183	32	136	32	168
Tranja	949.02	437.71	336.87	121.46						
Heranj	786.35	543.40	468.02	490.28	620	167	20	600	128	728
Machhiyel	525.14	89.96	353.91	299.67	453	56	86	367	66	433
Aslali	294.87	210.59	146.60	79.41	249	43	20	229	56	285
Punaj	500.47	492.32	406.62	164.79	460	40	35	425	95	520
Kunjera	341.80	299.70	270.45	128.44	313	28	35	278	70	348
Baroda	800.48	606.49	570.17	194.06	704	96	16	688	75	763
Palla	349.44	150.70	134.55	89.09	268	81	25	243	76	319
Asamali	1875.35	962.79	913.07	155.13	1185	287	23	1162	204	1366
Kharenti	930.07	796.07	727.54	176.13	844	92		844	372	1216
Khadhali	594.49	449.42	287.96	53.12	522	72	7	515	160	675
Sihlodi	384.70	0.00	41.70	41.37	347	37	9	238	73	411
Nadhanpur	958				855	103	11	844	377	1221
Kamla	590				528	62	30	498	97	595
Silod	380				297	83	2	295	95	390
Piplag	487				395	92	30	365	129	494
Maliyataj	446				415	31	24	391	58	449
Total	36240.55	20403.3	16177.85	8777.81	27088	4010	1111	25977	7060	33037