

Ground Water Resources

The Ground Water Resources and Irrigation Potential of the district were calculated up to March 2004 in collaboration with the Government of Gujarat using the methodology suggested by "Ground Water Estimation Committee (GEC-97)". The ground water resources for different talukas of the district are given in the table below.

Ground Water Resources Potentials

Taluka	Total Annual Recharge	Natural Discharge	Net Annual Ground Water Availability	Total Annual Draft	Ground Water Availability for future Irrigation	Stage of Ground Water Development (%)
Nizar	5529	276	5253	2799	2456	53.30
Valod	6561	328	6233	2318	3842	37.19
Olpad	22256	1113	21143	3373	17616	15.95
Choriyasi & City	9242	462	8780	6992	341	79.64
Mangrol	10819	541	10278	1610	8552	15.67
Limarwada	1069	53	1015	239	720	23.49
Ushchhal	3123	156	2967	487	2420	16.41
Mandvi	11457	373	10884	2463	8266	22.63
Falsona	8284	414	7870	4900	2872	62.26
Vyas	10345	517	9828	2435	7186	24.78
Bardoli	12786	639	12147	7043	4929	57.98
Songadh	9468	473	8994	872	7923	9.69
Kantrej	15097	795	15112	8632	6336	57.12
Mithuna	9013	451	8563	3337	5107	38.97
Total	135860	6793	129067	47500	78229	36.80

Ground Water Recharge

Total gross recharge for the district is 135860 ham. The net available recharge, after leaving natural discharge for non monsoon period for the district is 129067 ham.

Ground Water Draft

The gross draft in the district is 47500 ham.

Level of Ground Water Development & Stage

The level of Ground Water Development varies from 9.69% in Sonagadh Taluka to 79.64% in Choriyasi & City Taluka which falls in semi-critical category and overall Level of Development for the district is 36.80%. The overall category of the district is "Safe".

GROUND WATER QUALITY

Quality of Shallow Ground Water

The quality of ground water in the shallow aquifer has been studied based on the chemical analysis of water samples collected from NHS. Statistical analysis of these are presented in table below.

Statistical Analysis of Chemical Constituents (Shallow Aquifer)

Constituent	Alluvium			Basalt		
	Min	Max	Average	Min	Max	Average
TDS	241	2124	990	241	3142	639
pH	7	9	8	7	8	8
EC (µS/cm)	360	3170	1478	360	4690	954
CO ₃ (mg/l)	0	34	26	0	96	6
HCO ₃ (mg/l)	98	488	309	85	512	293
Cl (mg/l)	14	907	268	14	1460	136
NO ₃ (mg/l)	110	1	23	2	48	15
SO ₄ (mg/l)	4	192	47	5	145	38
F (mg/l)	0	2	1	0	1	1
Alkalinity	80	460	297	150	420	250
Ca (mg/l)	20	168	59	16	360	72
Mg (mg/l)	12	118	54	7	140	39
TH (mg/l)	170	830	371	140	1480	344
Na (mg/l)	12	500	174	15	460	70
K (mg/l)	0.10	30.0	4.83	0.0	9.3	2.2
SAR (mg/l)	0.40	11.42	3.86	0.4	5.2	1.4
Fe (mg/l)	0.030	0.373	0.183	0.035	0.969	0.246

Quality of Water from Deeper Aquifers

The ground water quality data for the basaltic areas of Surat district is based on exploratory wells. The electrical conductivity ranges from 590 µS/cm (Indu) to 1530 µS/cm at Songadh.

Ground Water Related Issues and Problems

- Water Logging in Ukai Kakrapar command area
- Salinity along the coastal area
- Poor availability of ground water in hard rock area in eastern part



GROUND WATER SCENARIO SURAT DISTRICT GUJARAT



CENTRAL GROUND WATER BOARD
West Central Region
Ahmedabad
March-2009

GROUND WATER SCENERIO IN SURAT DISTRICT, GUJARAT

INTRODUCTION

Surat district is situated in the southern part of Gujarat State. It is bounded by Bharuch and Namada district in the north, and Navsari district in the South and Arabian sea in the west. Surat district has a geographical area of about 6787 sq. km.

The district comprises fourteen Talukas, i.e., Bardoli, Choryasi & City, Kamrej, Mahuva Mandvi, Mangrol, Nizar, Olpad, Palsana, Songadh, Uchchhal, Valod and Vyara.

The major river draining the district is Tapi river which passes through part of the district and flows toward the west. It is a perennial river and originates from Madhya Pradesh near Betul. The other prominent rivers draining the district are Kim, Ver, Mindhola, Jhankhari, and Purna.

Rainfall & Climate

The rainfall in the district is confined between

June to October.

Long term normal

rainfall (1951-80)

for the Surat IMD

station is about

1 2 1 0 m m.

General climate

of the district is

sub-tropical and

is characterised by three well-defined seasons,

i.e. summer - from April to June, monsoon - from

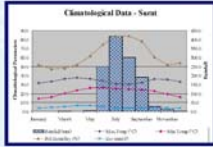
July to September, and winter - from October to

March.

Geomorphology

Four physiographic units have been established in the district.

- 1) High Relief Zone
- 2) Piedmont Zone.
- 3) Alluvial Plain.
- 4) Coastal Plain.



GROUND WATER OCCURRENCE

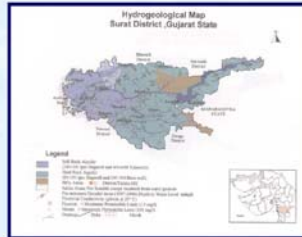
Hydrogeology

The hydrogeological frame work of the district is essentially governed by geological setting, distribution of rainfall and facilities of circulation and movement of water through inter connected primary and secondary porosity of the geological units forming the aquifers.

Aquifer System

Based on the geological formation the district can be divided broadly into two hydrogeological units:

Fissure Formations : Deccan Trap
Porous Formation : Alluvium



Deccan Trap

Deccan traps form aquifers in north-eastern, eastern and south-eastern parts of the district comprising Mangrol, Mandvi, Vyara, Valod, Mahuva, Songadh, Uchchhal and Nizar talukas. The depth of dug wells in Deccan traps range between less than 2m to 25 m. The majority of the dug wells have depth range between 5m and 15m. The yield of the wells varies from 50m³/day to 150m³/day with the maximum sustainable pumping of 4 to 5 hours.

Alluvium

The majority of the dug wells have depth range between 5m and 20m. The yield of the dug wells and dug-cum-bore wells range between 100 and 450 m³/day. The ground water in the deeper aquifers occur under semi-confined to confined conditions. The depth

of the tube wells ranges between 36m and 169m with the piezometric surface elevations between 2 and 10 m bgl. The deepest exploratory borehole was drilled down to the depth of 304.86m at Koshamada. The specific capacity of the tube wells range between 19 to 1658 m³/d/m. The value of Coefficient of Transmissivity obtained at the wells range between 104 and 2965 m²/day.

Change in Ground Water Scenario over the years. Long term water level data was analysed for 46 NNHS and water level trend is shown in table below.

Ground Water Level Trend of Surat district (Period 1st Jan. 97 to 30th Nov-06)

Location	Pre-monsoon		Post-monsoon		Overall	
	Rise (m/yr)	Fall (m/yr)	Rise (m/yr)	Fall (m/yr)	Rise (m/yr)	Fall (m/yr)
1. Purna	0.0573	0.0243	0.0643	0.0209		
2. Purni	0.0932		0.0518	0.0506		
3. Beshbh	0.0073	0.1478				0.0771
4. Keshnari		0.0311	0.1334	0.0343		
5. Mahuva2		0.0028	0.2372		0.2111	
6. Valod		0.1326		0.1773		0.0958
7. Beshbh	0.0464		0.1021		0.1309	
8. Ailo	0.0428		0.0213		0.1299	0.0412
9. Palsana		0.024	0.2348		0.1868	
10. Beshbh	0.3389					
11. Beshbh		0.024		0.0318		0.0329
12. Hishkh	0.1415			0.1297		0.0718
13. Vyara	0.033		0.0534			0.033
14. Beshbh	0.1331			0.118		0.0659
15. Purni		0.0605			0.0434	0.066
16. Mandvi		0.0405		0.0141		0.0744
17. Purni		0.062		0.0318		0.0018
18. Purni	0.0733		0.0209			0.1183
19. Uchchhal	0.1346			0.0229		0.0765
20. Beshbh	0.0331			0.1201		0.0233
21. Lankana		0.0149				0.0654
22. Vashis		0.149		0.0654		0.0381
23. Mandvi2	0.0333		0.1923			0.1411
24. Purni	0.1245			0.0459		0.1
25. Beshbh	0.19		0.144			0.0794
26. Purni	0.2937		0.1666			0.1466
27. Purni	0.0901		0.1568			0.1553
28. Purni	0.13		0.1023			0.0001
29. Uchchhal	0.1438		0.0923			0.0001
30. Purni	0.0479		0.12			0.0347
31. Mandvi	0.0935		0.321			0.2621
32. Purni		0.0742	0.0124			0.0032
33. Purni	0.1321			0.0009		0.3093
34. Purni	0.0624		0.1077			0.1462
35. Purni	0.0397		0.0181			0.0384
36. Purni	0.3383		0.363			0.3708
37. Purni	0.0377		0.0029			0.1073
38. Purni	0.162		0.0453			0.1107
39. Purni	0.179		0.2711			0.2999
40. Purni	0.1782		0.1333			
41. Purni	0.0392		0.084			0.0349
42. Purni	0.0318		0.0938			0.0347
43. Purni	0.178		0.173			0.0813
44. Purni	0.114		0.1086			0.0339
45. Purni	0.114		0.0383			0.0013
46. Purni						
Sum	40	60	60	40	59.70	35.30