



केंद्रीय भूमि जल बोर्ड

जल संसाधन, नदी विकास और गंगा संरक्षण मंत्रालय

भारत सरकार

Central Ground Water Board

Ministry of Water Resources, River Development and Ganga

Rejuvenation

Government of India

Report on

AQUIFER MAPPING AND MANAGEMENT PLAN

Tiptur Taluk, Tumkuru District, Karnataka

दक्षिण पश्चिमी क्षेत्र, बैंगलोर

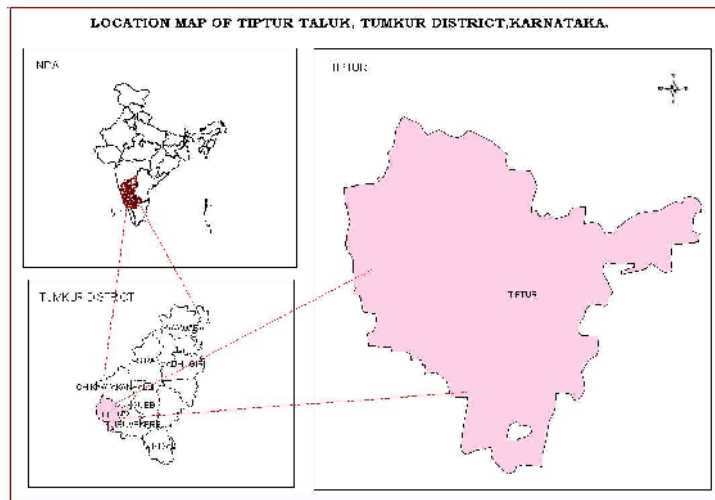
South Western Region, Bengaluru

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**Government of India
Ministry of Water Resources, River Development
& Ganga Rejuvenation
Central Ground Water Board**

**TIPTUR TALUK AQUIFER MAPS AND MANAGEMENT PLANS,
TUMKURU DISTRICT, KARNATAKA STATE**



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**TIPTUR TALUK AQUIFER MAPS AND MANAGEMENT PLANS
TUMKUR DISTRICT, KARNATAKA STATE**

1. SALIENT INFORMATION

- 1.1 Name of the Taluk** : Tiptur
District : Tumkur
State : Karnataka
Area : 790 sq.kms
Population : 2, 22,747 (2011)
Annual NormalRainfall :705 mm
Location map is given in figure 1.

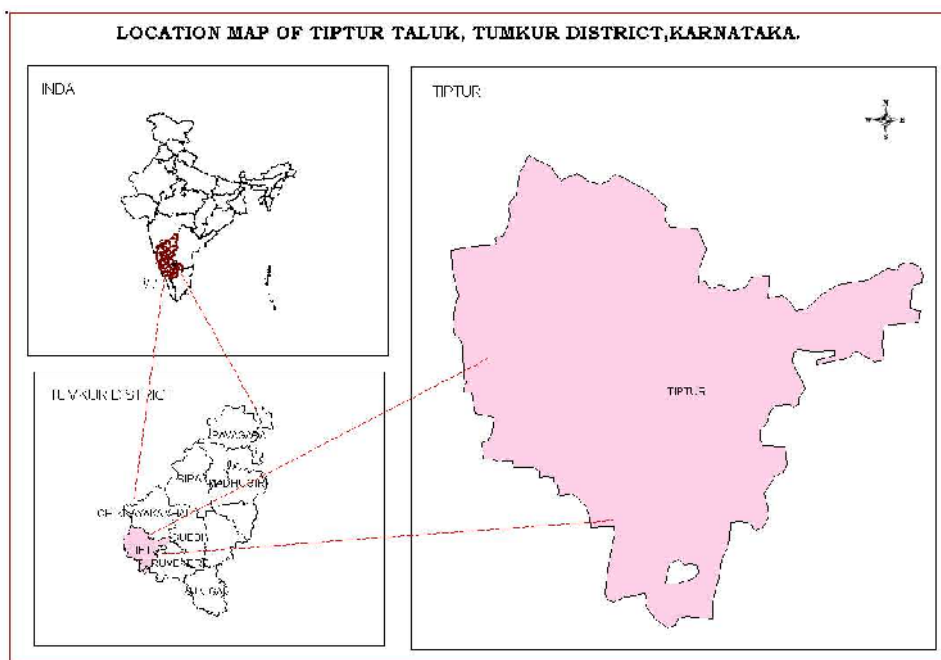


Fig 1: Administrative map of Tiptur taluk

- 1.2 Area** : 790 sq.kms
Coordinates : E76°18' 19.94" - 77°43' 54.26" and N 13°03' 1.84" - 13°26' 41.80"
SOI Toposheets : 57 C/7, C/8, C/11 and C/12
- 1.3 Population** : As per 2011 Census

Taluk/Area	Rural	Urban	Total	Decadal Growth rate (%)	Density of Population/sq.km
Tiptur taluk/ 790 sq.km	163206	59543	222747	6.26	283
Tumkur district/ 10,597 sq.km	2079902	599078	2678980	3.65	253
For the year 2025, the projected population for Tiptur taluk is 241127					
For the year 2025, the projected population for Tumkur district is 2810957					

1.4 Normal Rainfall : (1981-2010) in mm

Taluk	Annual normal Rainfall	Normal monsoon Rainfall	Normal Non-monsoon rainfall
Tiptur	705	338	367



Fig 2: Drainage map of Tiptur taluk

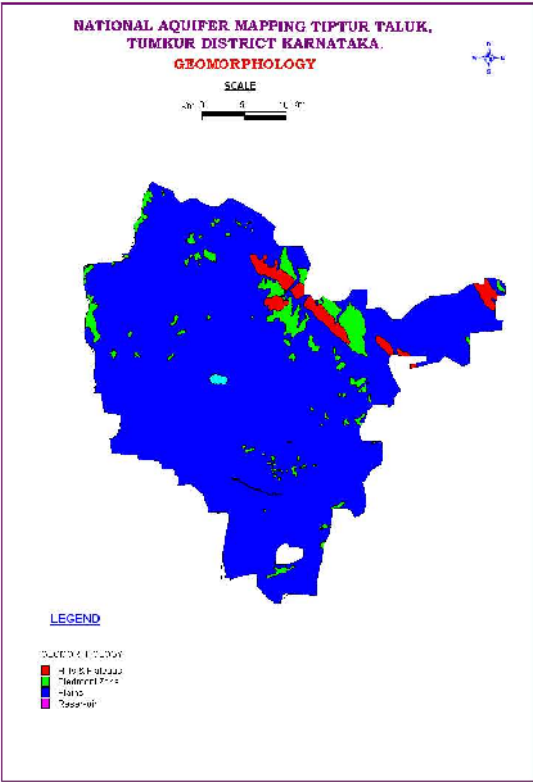


Fig. 3: Geomorphology map of Tiptur taluk

1.5 Agriculture and Irrigation (Area in Ha)

Principal crops	Net sown Area	Gross sown Area	Cropping Intensity	Area under Irrigation
Paddy, Ragi, Pulses, Oil seeds, fruits and vegetables	53582	66377	-	22890

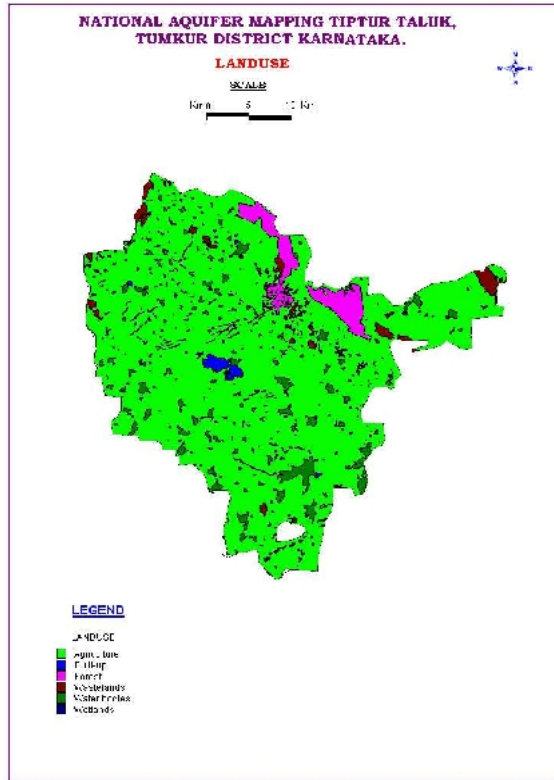


Fig 3: Land use/land cover map of Tiptur taluk

1.6 Groundwater Resources Availability and Extraction as on 2011 (in ham): (Aquifer wise up to 200 m depth)

Taluk	Annual replenishable GW resources	Fresh in-storage GW resources		Total availability of fresh GW resources
		Phreatic	Fractured (Down To 200 m)	Dynamic + Phreatic in-storage + fractured
Tiptur	5298	11899	1611	18808

Extraction:

Taluk	Net annual GW availability	Total draft for all uses	Stage of GW development (%)	Category
Tiptur	5898	6431	121	Over Exploited

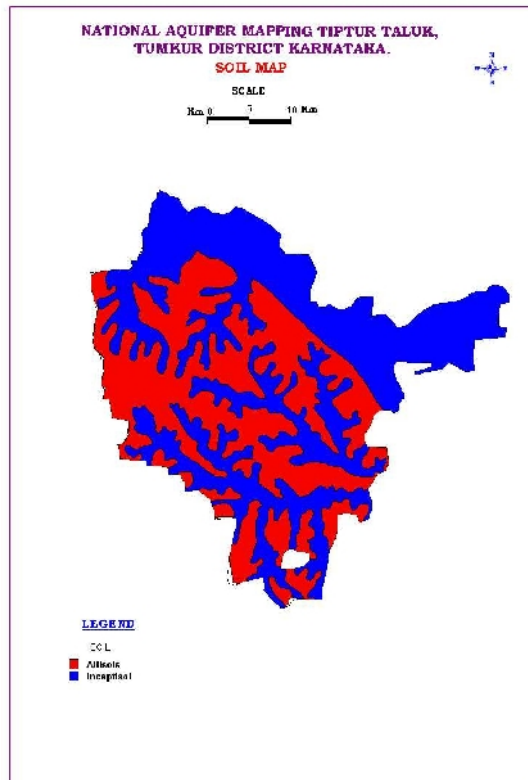


Fig 4: Soil map of Tiptur taluk

1.7 Existing and future water demands

- No scope for further irrigation from ground water except few patches where ground water level still shallower throughout the year.
- Existing Domestic and Industrial sector demand: 2.22MCM (as on GEC – 2011)

1.8 Water level behaviour (as on 2016)

Depth to water level

Aquifer – I

- Pre-monsoon :2.70to9.55m bgl
- Post-monsoon :2.65to10.03m bgl
- Fluctuation : Rise: 0.05 to 0.65, Fall:0.40 to 1.20m bgl

Aquifer – II

- Pre-monsoon :25.10to 58.82m bgl
- Post-monsoon :22.70to83.50 m bgl
- Fluctuation : Rise: 0.60 to 5.80, Fall: 4.10 to 24.68 m bgl

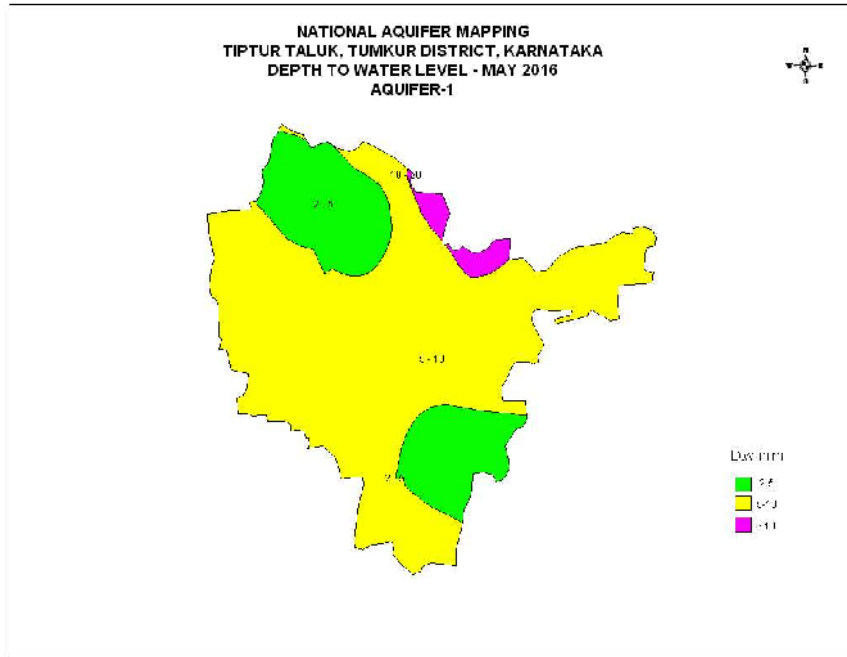


Fig. 4: Pre-monsoon depth to water level map – Aquifer I

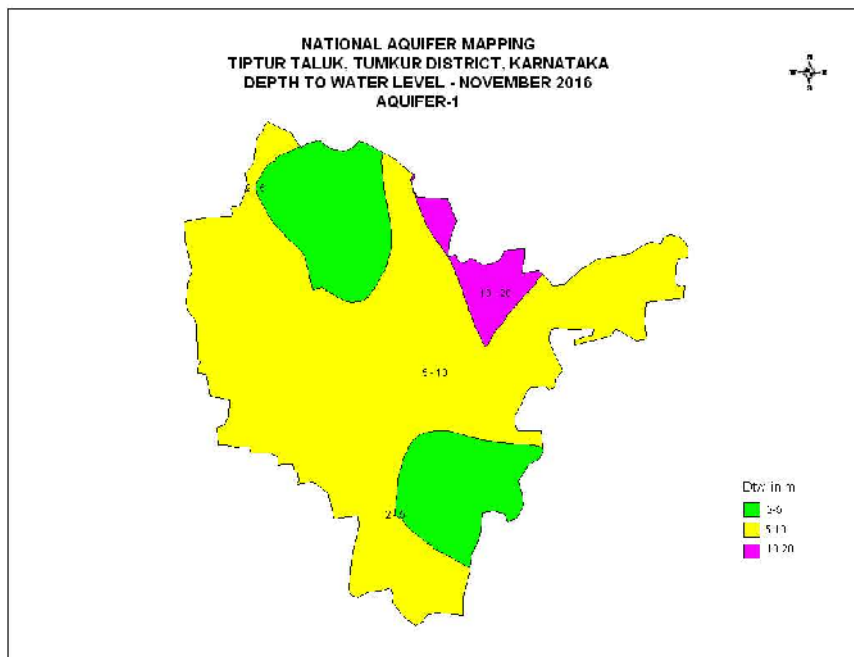


Fig. 5: Post-monsoon depth to water level map – Aquifer I

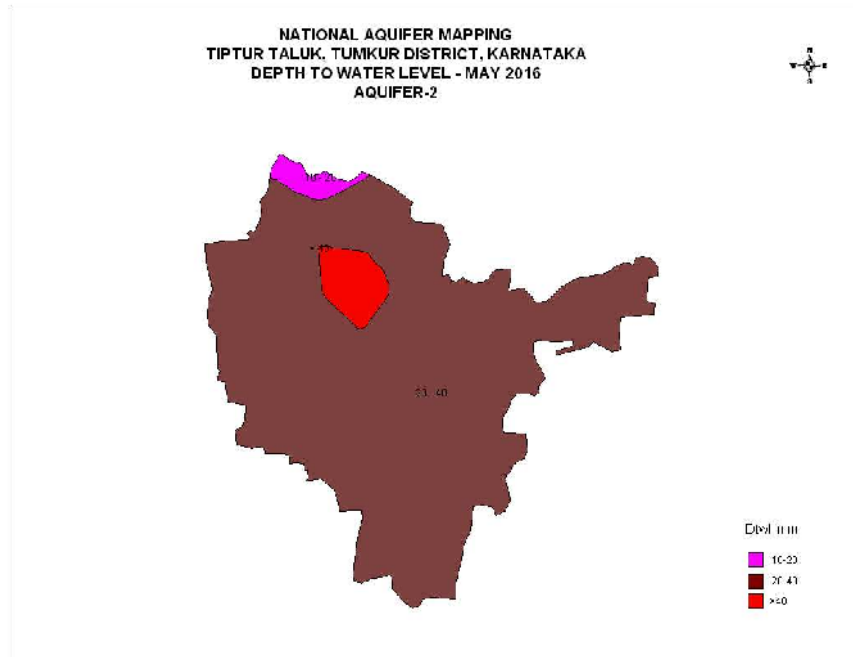


Fig. 6: Pre-monsoon depth to water level map – Aquifer II

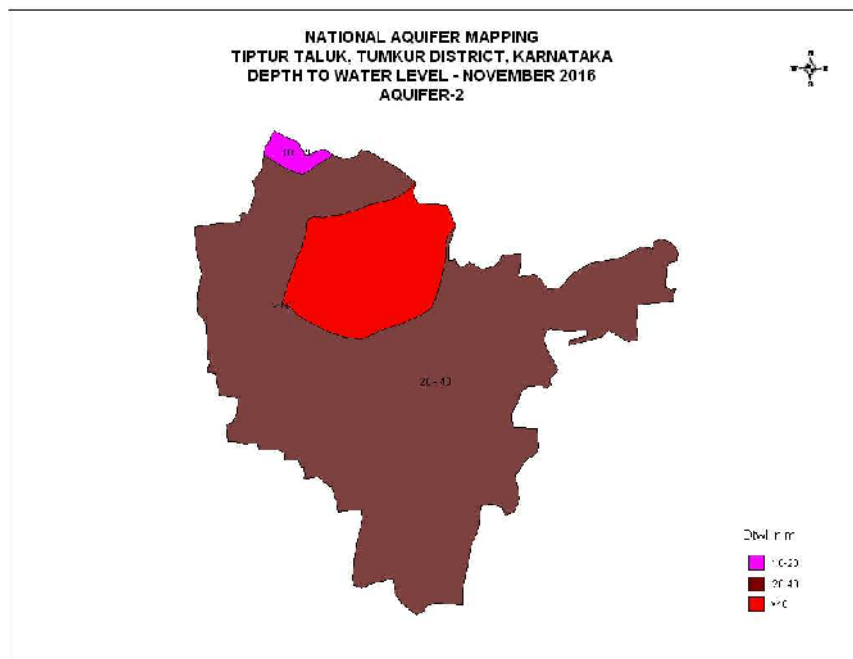


Fig. 7: Post-monsoon depth to water level map – Aquifer II

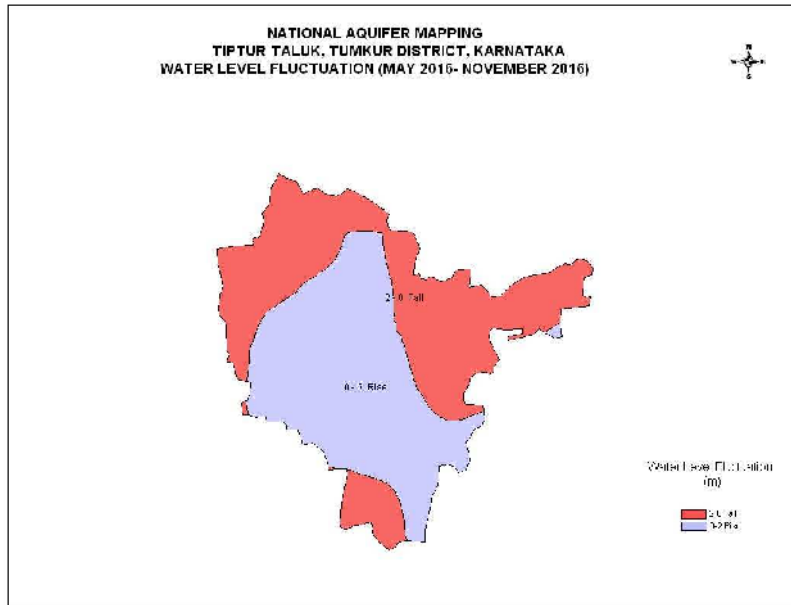


Fig. 8: Water level fluctuation map – Aquifer I & II

2. AQUIFER DISPOSITION

In the area, there are mainly two types of aquifer systems:

- i) Aquifer – I (Phreatic aquifer) comprising weathered gneiss and schist.
- ii) Aquifer – II (Fractured, multi-aquifer system) comprising fractured gneisses and schist.

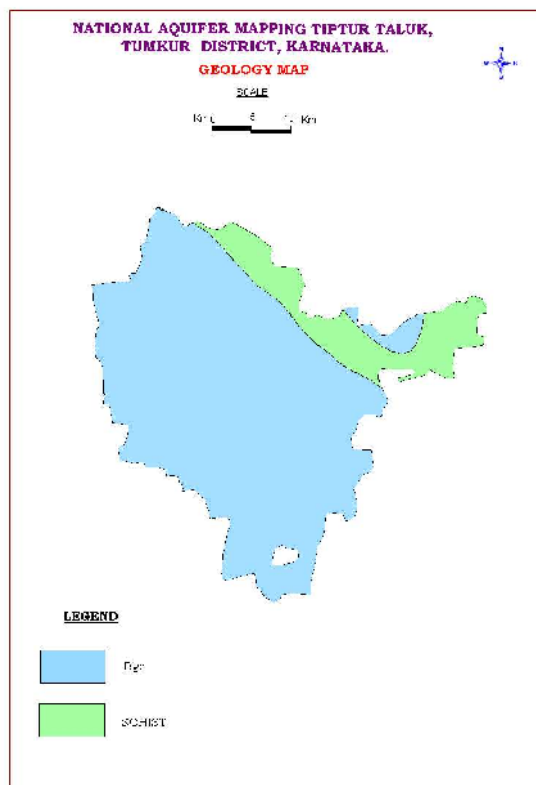


Fig 9: Geology map of Tiptur taluk

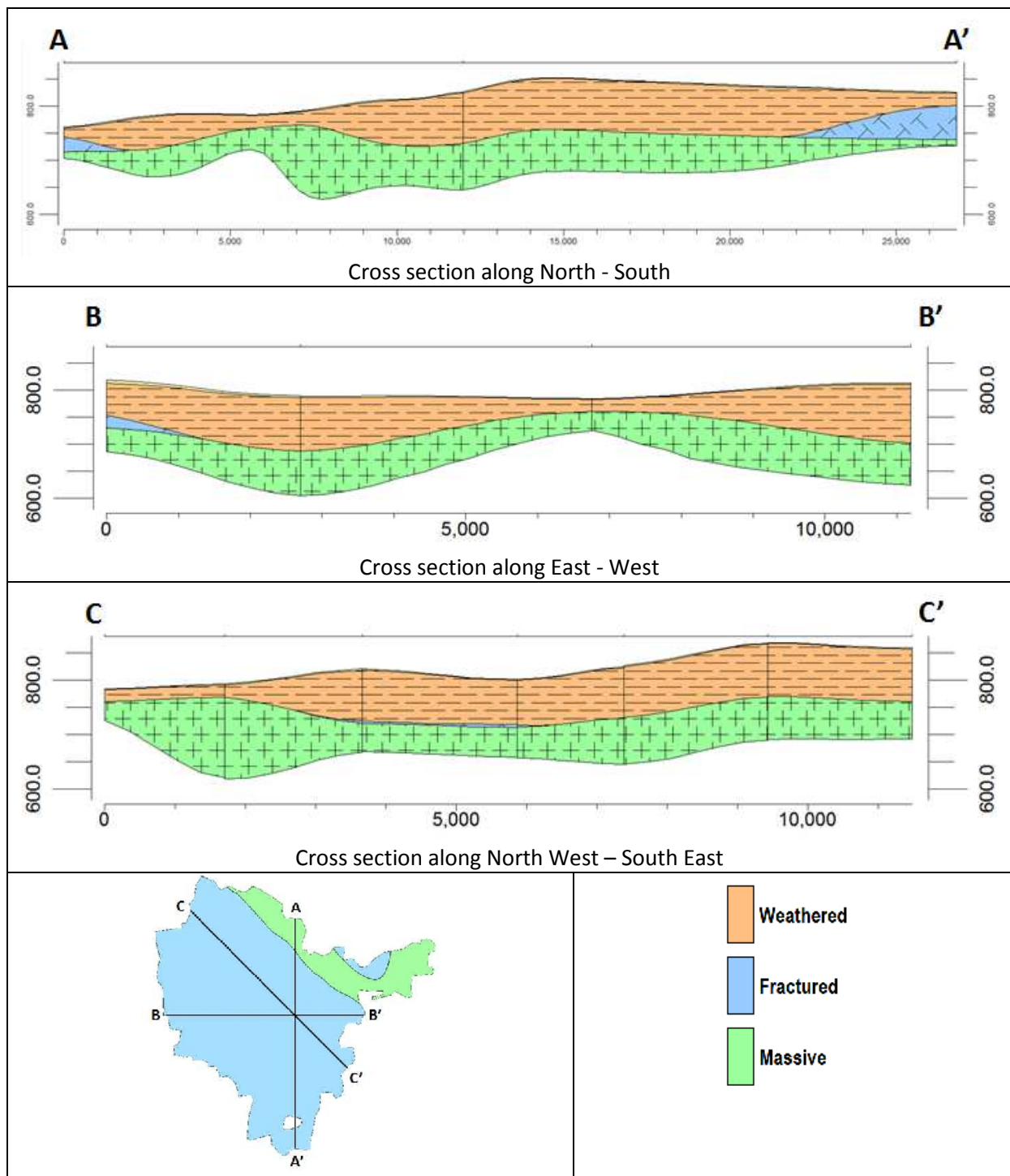


Fig 10: Aquifer cross sections in Tiptur taluk

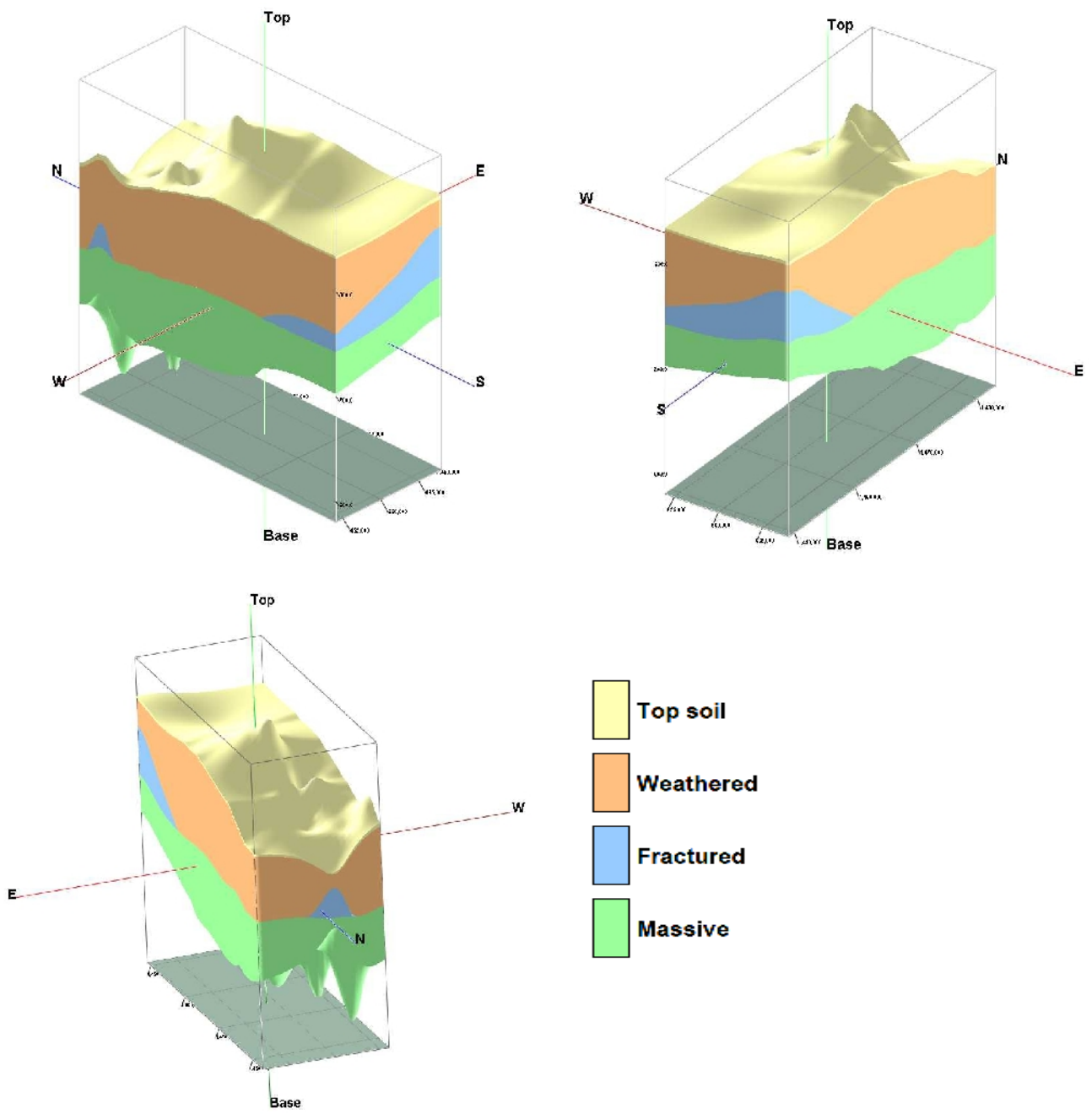


Fig 11: Aquifer 3D - disposition models of Tiptur taluk

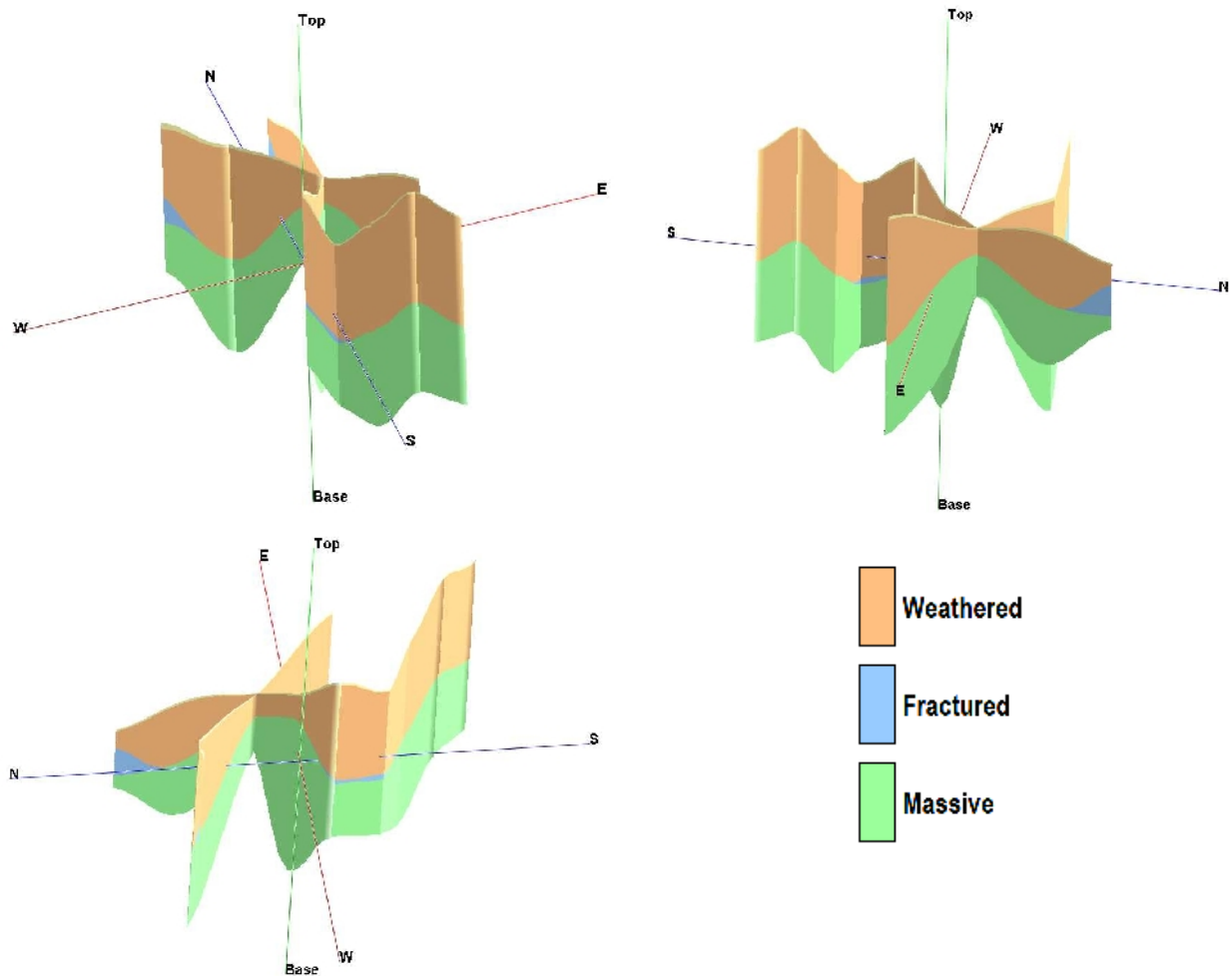


Fig 12: Fence diagrams of Tiptur taluk.

3. ROUND WATER RESOURCES, EXTRACTION, CONTAMINATION AND OTHER ISSUES

3.1 Groundwater Resource (2011) (Ham)

Taluk	Net annual GW availability	Total draft for all uses	Stage of GW development (%)	Category
Tiptur	5298	6431	121	Over Exploited

Total GW Resources (2009) (Ham)

Taluk	Annual replenishable GW resources	Fresh In-storage GW resources		Total availability of fresh GW resources
		Phreatic	Fractured	Dynamic + Phreatic in-storage + Fractured
Tiptur	5753	11889	1611	19253

3.2 Groundwater Quality (May 2014)

Generally the ground water is good and potable.

EC Range: 850– 1920 μ S/cm at 25°C

Fluoride range: 0.33– 0.99 mg/l

Nitrate range: 10– 50 mg/l

3.3 Poor sustainability

- Ground water is the sole source
- Rainfall is the only source of recharge
- Deep borewells of more than 1200 feet with deep seated fractures are not sustainable under OE condition
- Deep fractured aquifers are not annually getting recharged and hence, due to prevailing heavy over-draft condition, fractured aquifers are not sustainable.

4. GROUND WATER RESOURCES ENHANCEMENT

4.1 Aquifer wise space available for recharge and proposed interventions

Quantity of water available through non-committed surface runoff

Artificial Recharge Structures Proposed	Tiptur taluk
Non committed monsoon runoff available (Ham)	5800
Number of Check Dams	36
Number of Percolation Tanks	2
Number of Point Recharge structures	4
Tentative total cost of the project (Rs. in lakhs)	133
Excepted recharge (MCM)	3.285
Expected rise in water level (m)	0.233
Cost Benefit Ratio (Rupees/ cu.m. of water harvested)	4.255

4.2 Improvement in groundwater availability due to recharge:

GROUND WATER AVAILABILITY AND DRAFT SCENARIO AND EXPECTED IMPROVEMENT IN STAGE OF GROUND WATER DEVELOPMENT

Taluk	NET ANNUAL GROUND WATER AVAILABILITY	EXISTING GROSS GROUND WATER DRAFT FOR ALL USES	EXISTING STAGE OF GROUND WATER DEVELOPMENT	EXPECTED RECHARGE FROM ARTIFICIAL RECHARGE PROJECTS	ADDITIONAL POTENTIAL FROM PROPOSED YETTINAHOLE PROJECT	CUMULATIVE ANNUAL GROUND WATER AVAILABILITY	EXPECTED IMPROVEMENT IN STAGE OF GROUND WATER DEVELOPMENT AFTER THE IMPLEMENTATION OF THE PROJECT	EXPECTED IMPROVEMENT IN OVERALL STAGE OF GROUND WATER DEVELOPMENT
	HAM	HAM	%	HAM	HAM	HAM		%
Tiptur	5424	6756	125	329	0	5752	117	7

4.3 Other interventions proposed, if any: - Nil

5. DEMAND SIDE INTERVENTIONS

5.1 Advanced irrigation practices

- Efficient irrigation practices like drip irrigation and sprinkler are already adopted by farmers in few pockets of the area.
- Existing ground water draft for irrigation is 6332 ham as on GEC 2013

5.2 Change in cropping pattern

Not necessary as due to water scarcity, heavy duty crops are not grown in the taluk.

5.3 Alternative water sources

- Inter-basin transfer from west-flowing river of Yettinahole project (taluk wise quantity to be assessed)
- Transporting tertiary treated water from Bangalore city and filling minor irrigation tanks for ground water recharge (taluk wise quantity to be assessed)

5.4 Regulation and Control

It is notified by Karnataka Ground Water Authority.

5.5 Other interventions proposed, if any - Nil

