

**CHAMARAJNAGAR DISTRICT****FIG.8 CHAMARAJNAGAR DISTRICT**

<b>Sl.No.</b>	<b>CONTENTS</b>	<b>Page</b>		
1)	Location	134	TABLE: COMPREHENSIVE ANALYSIS OF WATER QUALITY DATA	139
2)	Demography	134		
3)	Climate, Drainage and soil	134	<b>LIST OF FIGURES</b>	
4)	Geology and Groundwater occurrence	134	FIG.8A FLUORIDE VARIATION (F)	140
5)	Groundwater quality Characterization	134	FIG.8B VARIATION OF TOTAL DISSOLVED SALTS (TDS)	141
5.1	Physical characters	135	FIG.8C VARIATION OF TOTAL HARDNESS (TH)	142
5.2	Chemical characters	135	FIG.8D IRON VARIATION (Fe)	143
5.3	Spatial variation	137		
6)	Conclusion	137		

## 1. Location

Chamrajnagar district is located in the southern extreme of Karnataka State with a geographical area of 5685 sq. km. Bangalore and Mandya districts bound it on the northern side, Mysore district on the northwestern side, Tamil Nadu State on the eastern, southern and southeastern side. It lies between 11<sup>o</sup> 35' to 12<sup>o</sup> 19' N Latitude 76<sup>o</sup> 24' to 77<sup>o</sup> 47' E Longitude.

## 2. Demography

As per the 1991 census, Chamrajnagar district has a population of 883,365. The total number of villages / habitations in the district are 830. Chamrajnagar district has 4 taluks viz. Chamrajnagar, Gundlupet, Kollegal and Yelandur.

## 3. Climate, Drainage and Soil

Chamrajnagar district forms part of the southern maidan region, which comprises of broad undulating plateau with elevations ranging between 600 to 1000 m. Very famous hills like Biligirirangana betta is located in Yelandur taluk. The district receives an average annual rainfall of 747.6 mm. Many rivers drain the district. Most important ones are Cauvery, Kabini, Gundal and Suvarnavati. Chamrajnagar district experience temperature variation between 19.2<sup>o</sup> to 29.6<sup>o</sup> C. Major portions of the district is covered by red soil.

## 4. Geology and Groundwater occurrence

Chamrajnagar district consists mainly of Charnockites, granites and gneisses. From the groundwater point of view, these rocks are classified as crystalline formations. The fracture / fissure system developed along with joints and faults traversing the rocks facilitate groundwater circulation and hold moderate quantity of water. The quality of groundwater is governed by the mineralogical composition of the rocks. Many isolated bands of manganiferous iron formations are also seen. Groundwater occurs in the water table conditions in the weathered and decomposed mantle and also under semi-confined conditions in the deeper fractures.

## 5. Groundwater quality characterization

To understand and gather information on groundwater quality, 5083 samples collected from 670 villages / habitations in Chamrajnagar district have been analysed by RDED.

The water samples have been analysed for only 14 parameters such as Turbidity, Colour, Conductivity, Hydrogen ion concentration (pH), Total Dissolved Salts (TDS), Total Hardness (TH), Calcium Hardness (CaH), Chloride (Cl), Sulphate (SO<sub>4</sub>), Fluoride (F), Nitrate (NO<sub>3</sub>), Alkalinity (Alk), Iron (Fe) and Bacteria and the data is presented in the Table.

## 5.1 Physical Characters

### Turbidity

In all, 551 samples from 277 villages have recorded higher turbidity ranging between 10.1 to 285 JTU. The samples showing higher turbidity are from: Chamrajnagar (236 out of 1964 samples), Gundlupet (35 out of 1164 samples), Kollegal (101 out of 1495 samples) and Yelandur (179 out of 460 samples). Highest turbidity of 285 JTU is recorded from Malladevanahalli village in Chamrajnagar taluk.

### Colour

As many as 2582 samples collected from 623 villages have shown the high colour intensity in the range of 26 to 812 HU. Abnormal samples are from: Chamrajnagar (1252 samples from 223 villages), Gundlupet (371 samples from 158 villages), Kollegal (742 samples from 196 villages) and Yelandur (217 samples from 46 villages). Highest Colour intensity of 812 HU is recorded from Bandipura village of Gundlupet taluk.

### Electrical Conductivity (EC)

The EC values in different taluks are: Chamrajnagar 40-950 m mhos/cm, Gundlupet 20-2170 m mhos/cm, Kollegal 10-1500 m mhos/cm and Yelandur 90-3680 m mhos/cm.

### Hydrogen ion concentration (pH)

Some 269 samples covering 174 villages have shown the pH value in the range of 5.7 to 9.2. The ranges of pH values recorded are Chamrajnagar (187 samples with pH value of 5.7 to 6.4), Gundlupet (15 samples with pH value of 5.9 to 6.4), Kollegal (14 samples with pH value of 8.6 to 9.2) and Yelandur (53 samples with pH value of 5.8 to 6.4).

## 5.2 Chemical Characters

### Total Dissolved Salts (TDS)

No abnormal TDS concentration is reported in the entire district.

### Total Hardness (TH)

None of the sample in the entire district has analysed Total Hardness content more than the permissible limit.

**Calcium Hardness (CaH)**

There are 1912 samples spread across 577 villages having higher CaH ranging from 200.1 to 464 ppm. The abnormal samples are from Kollegal (730 samples with CaH content of 200.2 to 464 ppm), Gundlupet (567 samples with CaH content of 200.1 to 398 ppm), Chamrajnagar (539 samples with CaH content of 200.1 to 421 ppm) and Yelandur (76 samples with CaH content of 202 to 253 ppm). Highest CaH content of 464 ppm is reported from Angallidoddi village of Kollegal taluk.

**Chloride (Cl)**

None of the sample in the entire district has analysed Chloride content more than the permissible limit.

**Sulphate (SO<sub>4</sub>)**

No abnormal Sulphate concentration is reported in the entire district.

**Fluoride (F)**

Only 16 samples, 3 samples from Chamrajnagar, 4 samples from Gundlupet and 9 samples from Kollegal taluks have shown slightly higher Fluoride content ranging between 1.55 to 1.8 ppm. Yelandur taluk has recorded Fluoride content within the permissible limit.

**Nitrate (NO<sub>3</sub>)**

About 183 samples covering 94 villages / habitations have analysed NO<sub>3</sub> content beyond the permissible limit. These samples are from Chamrajnagar (145 samples from 61 villages with Nitrate content of 101 to 167 ppm), Kollegal (22 samples from 21 villages with Nitrate content of 110 to 180 ppm) and Yelandur (16 samples from 12 villages with Nitrate content of 101 to 108 ppm). Gundlupet taluk has Nitrate content well within the permissible limit.

**Alkalinity (Alk)**

Quite a good number of samples 2977 samples from 613 villages have recorded high Alkalinity in the range of 610 to 2000 ppm. Highest Alkalinity of 2000 ppm is recorded from Kunagalli village of Kollegal taluk.

**Iron (Fe)**

Only 200 samples from 171 villages have shown the higher iron content ranging between 1.2 to 5 ppm. Abnormal samples are from Chamrajnagar (100 samples with Fe content of 2 to 5 ppm), Gundlupet (56 samples with Fe content of 1.2 to 5 ppm), Kollegal (27 samples with Fe content of 1.2 to 5 ppm) and Yelandur (17 samples with Fe content of 2 to 5 ppm).



### **Bacteria (E.Coli)**

Nearly 612 samples covering 331 villages have shown the presence of Bacteria in the analysed water samples. The Bacterial count in the district cannot be given, since the analytical data has not specified the number of bacteria counted per 100 ml in the particular samples. Bacterial incidence in different taluks is Chamrajnagar (210 samples from 147 villages), Gundlupet (131 samples from 54 villages), Kollegal (189 samples from 88 villages) and Yelandur (82 samples from 42 villages).

### **5.3 Spatial Variation**

#### **Bacteria (E.coli)**

The map depicting number of samples analysed for the individual villages indicates that, nearly half of the sampled villages are affected by bacterial incidence and are spread unevenly throughout the district.

#### **Fluoride (F)**

The isoconcentration map of Fluoride for Chamrajnagar district (Fig.8A) depicts that; only an isolated patch around Padhakodu village in the western portion of the Chamrajnagar taluk shows higher concentration.

#### **Total Dissolved Salts (TDS)**

The isoconcentration map for TDS (Fig.8B) generated for the district shows that, entire district is having TDS content well within the permissible limit.

#### **Total Hardness (TH)**

The isoconcentration map (Fig.8C) reveals that, entire district is having TH content well within the permissible limit.

#### **Iron (Fe)**

The spatial variation map generated for Iron (Fig.8D) shows that, only 3 isolated patches located in the northern half of the district (one each in Gundlupet, Chamrajnagar and Kollegal taluks) have slightly higher Fe content.

### **6. Conclusion**

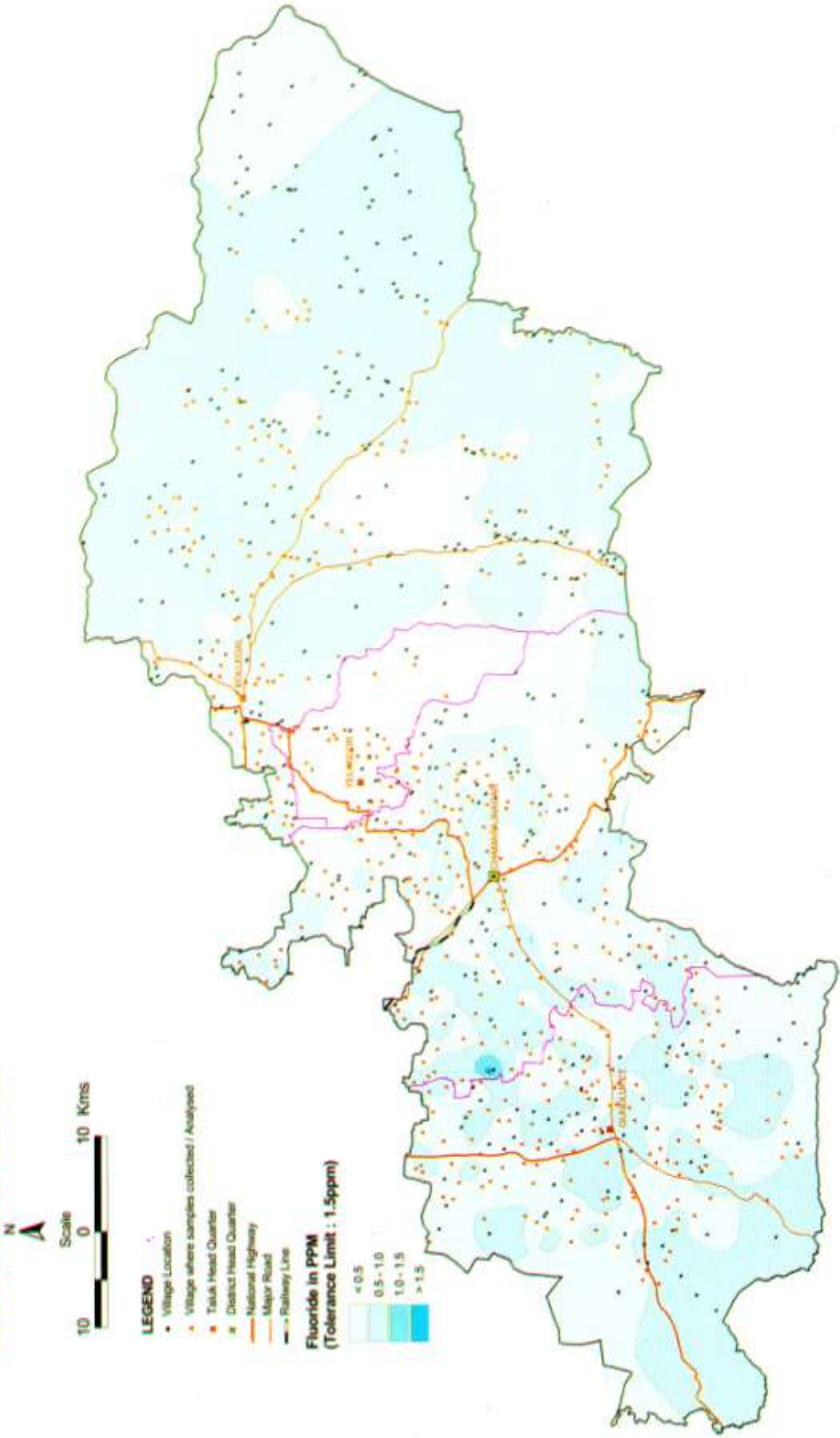
The water quality data of Chamrajnagar district has reflected comparatively higher Turbidity, Colour, the presence of excess CaH, Alkalinity and contamination with Bacteria. High Colour intensity is due to suspended matter present in the water and by repeated filtration, the Colour intensity and Turbidity can be reduced. The most important component that is much more harmful is the presence of Bacteria viz., *E. coli* in drinking water. The consumption of such water may cause the diseases such

as Malaria, Diarrhea etc. These organisms might have been introduced into the groundwater regime by anthropogenic activities. This clearly indicates non-hygienic / poor sanitation condition prevailing at village levels. To overcome this both the user and the administrator must be trained properly and awareness has to be created regarding hygienic aspects.

**Table: Comprehensive analysis of water quality data of Chamrajnagar District**

SL.NO.	Name of the taluks	Number of villages/habitations	Number of sampled villages	Number of samples analysed	Water quality scenario	Bact (c/100 ml)-0	Tur (10) JTU	Color (25 HU)	Cond- mmhos/cm	pH (6.5-8.5)	TDS (2000) ppm	TH (600) ppm	CaH (200) ppm	Cl (1000) ppm	SO <sub>4</sub> (400) ppm	F (1.5) ppm	NO <sub>3</sub> (100) ppm	Alk (600) ppm	Fe (1) ppm
1	Chamrajnagar	283	227	1964	No. of samples beyond permissible limit	210	236	1252	-	187	-	-	539	-	-	3	145	532	100
					No. of Village affected	147	127	223	-	123	-	196	-	3	61	186	83		
					Range	Present	11-156	26-314	40-950	5.7-6.4	-	200-1421	-	1.57-1.6	101-167	610-1090	2-5		
2	Gundlupete	227	179	1164	No. of samples beyond permissible limit	131	35	371	-	15	-	-	567	-	-	4	-	1000	56
					No. of Village affected	54	30	158	-	13	-	151	-	4	-	175	47		
					Range	Present	11-285	26-812	20-2170	5.9-6.4	-	200-1398	-	1.55-1.7	-	610-1980	1.2-5		
3	Kollegal	324	216	1495	No. of samples beyond permissible limit	189	101	742	-	14	-	-	730	-	-	9	22	1348	27
					No. of Village affected	88	76	196	-	9	-	194	-	9	21	215	26		
					Range	Present	10.1-94	26-81	10-1500	8.6-9.2	-	200.2-464	-	1.56-1.8	110-180	610-2000	1.2-5		
4	Yelahndur	48	48	460	No. of samples beyond permissible limit	82	179	217	-	53	-	-	76	-	-	-	16	97	17
					No. of Village affected	42	44	46	-	29	-	36	-	-	12	37	15		
					Range	Present	10.1-110	26-160	90-3680	5.8-6.4	-	202-253	-	-	101-108	610-800	2-5		
Total	882	670	5083	5083	No. of samples beyond permissible limit	612	551	2532	-	269	-	-	1912	-	-	16	183	2377	200
					No. of villages affected	331	277	623	-	174	-	577	-	16	94	613	171		
					Range	Present	10.1-285	26-812	10-3680	5.7-9.2	-	200.1-464	-	1.55-1.8	101-180	610-2000	1.2-5		

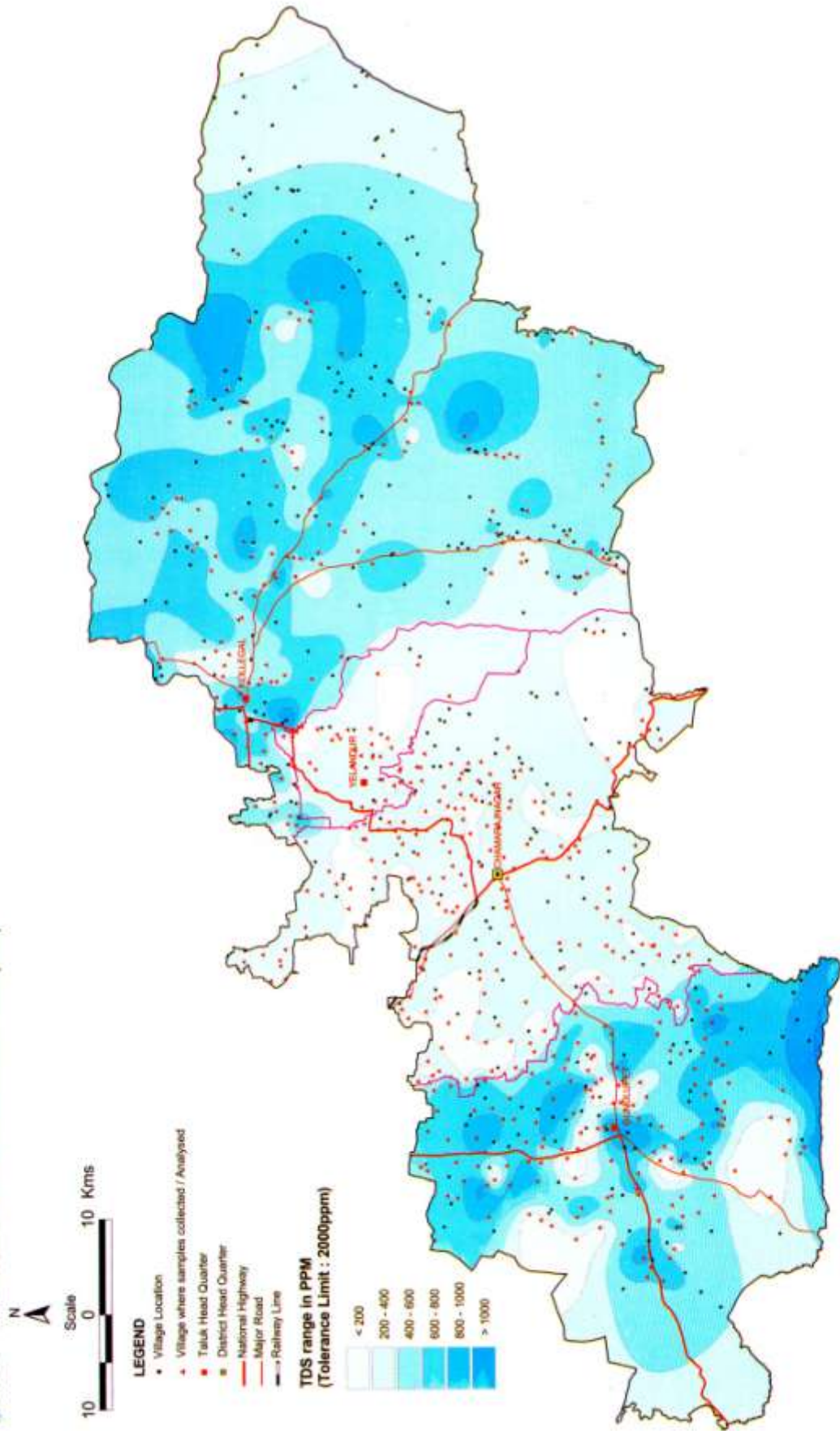
**CHAMRAJNAGAR DISTRICT**  
**FIG.8A : FLUORIDE VARIATION**





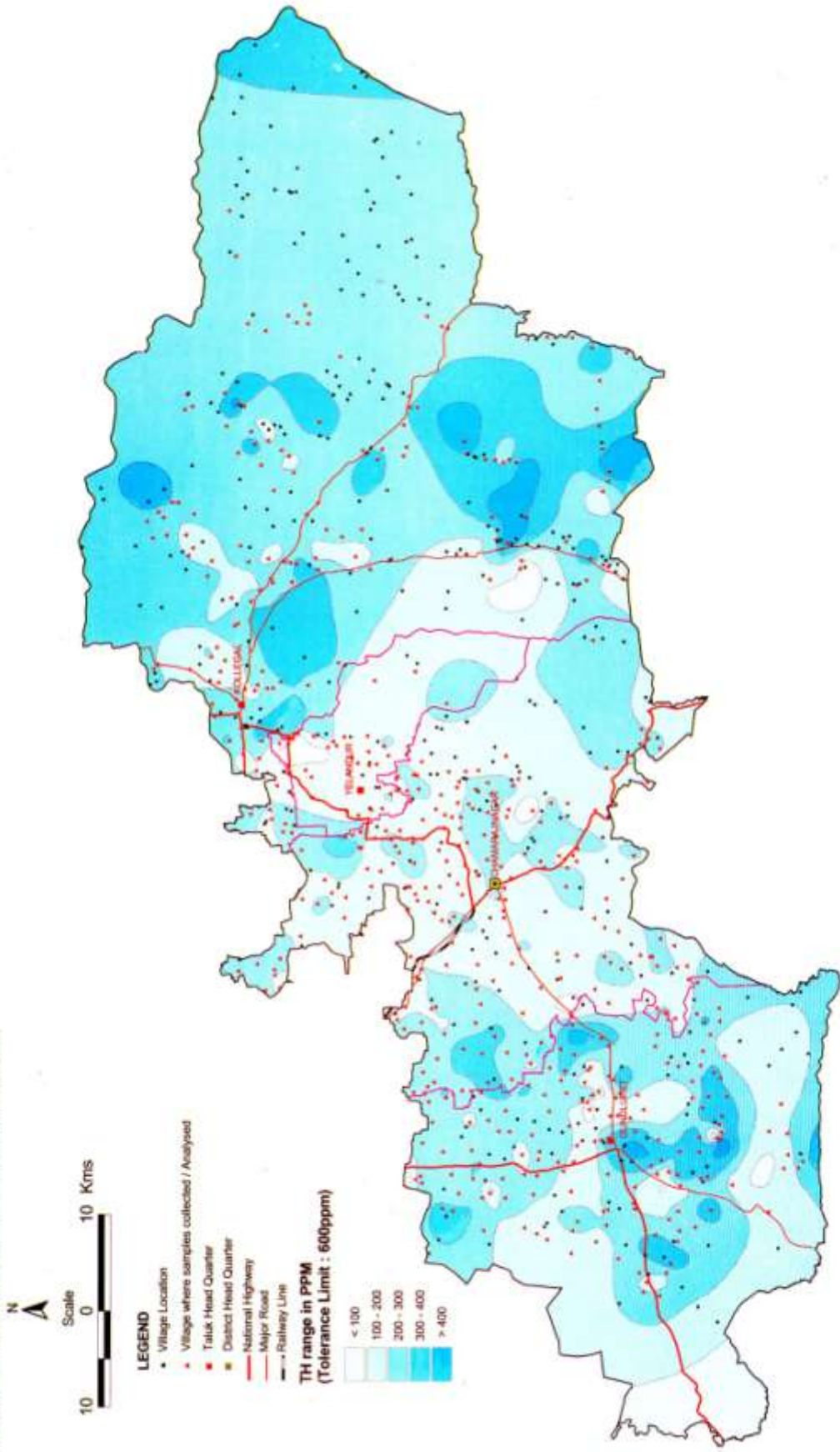
# CHAMRAJNAGAR DISTRICT

FIG.8B : VARIATION OF TOTAL DISSOLVED SALTS (TDS)



# CHAMRAJNAGAR DISTRICT

FIG.8C : VARIATION OF TOTAL HARDNESS (TH)



**CHAMRAJNAGAR DISTRICT**  
**FIG.8D : IRON VARIATION**

