MYSORE DISTRICT

FIG.22 MYSORE DISTRICT

1. Location

Mysore district is located in the southern portion of Karnataka State with an area of 6269 sq. km. It is bounded by Kodagu district on western side, Hassan district on northern side, Mandya district on northeastern side, Chamarajnagara district on eastern side and Tamil Nadu State on southern side. It lies between 11° 45' to 12° 38' N Latitude and 75° 54' to 77° 08' E Longitude.

2. Demography

As per the 1991 census, Mysore district has a population of 2,281,653. The total number of villages / habitations in the district are 1,934. Mysore is the only city and is also the district and divisional headquarters. Mysore district has 7 taluks viz., Heggadadevankote, Hunsur, Krishnarajanagara, Mysore, Nanjanagud, Piriyapatna and T.Narsipura

3. Climate, Drainage and Soil

The climate is moderate throughout the year. The average annual rainfall received by the district is 761.9 mm. The district is drained by Cauvery, Kabini, Lakshmantirtha, Palar, Nugu and Moyar rivers. Mysore district experience temperature variation between 19.2°C to 39.6°C. Major portion of the district is covered by red and sandy soils.

4. Geology and Groundwater occurrence

The migmatitic gneisses cover about 90% of the area in Mysore district. A crescent shaped body of younger granite called, as Chamundi granite is located in the Chamundi hills. From the groundwater point of view, maximum portion of the district is covered by the 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. The schist belt rocks consisting of amphibolites, pelitic schist, quartzite, iron formation and minor carbonate are also exposed. These schist belt rocks are poor aquifers and yield poorer quality water in very less quantity. Groundwater generally 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, 8069 groundwater samples collected from 1668 villages / habitations in Mysore 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),

5.2 Chemical Characters

Total Dissolved Salts (TDS)

About 325 samples covering 200 villages / habitations have higher TDS content in the range of 2004-6278 ppm. The ranges of abnormal TDS content in different taluks are Heggadadevanakote 2049-2746 ppm (4 samples), Hunsur 2010-4342 ppm (97 samples), Krishnarajanagara 2010-3685 ppm (66 samples), Mysore 2004-2976 ppm (46 samples), Nanjanagud 2004-3485 ppm (53 samples), Piriyapatna 2004-3844 ppm (19 samples) and T. Narsipura 2011-6278 ppm (40 samples). The highest value of 6278 ppm is reported from Benakanahalli village in T.Narasipura taluk.

Total Hardness (TH)

In the entire district, 1387 samples spread across 632 villages/habitations have indicated higher TH values in the range of 601 to 3178 ppm. The range of TH values in different taluks are Heggadadevanakote 602-1384 ppm (59 samples), Hunsur 605-3178 ppm (389 samples), Krishnarajanagara 602-1320 ppm (134 samples), Mysore 601-1356 ppm (253 samples), Nanjanagud 601-1176 ppm (156 samples), Piriyapatna 610-1940 ppm (316 samples) and T. Narsipura 602-1438 ppm (80 samples). The maximum TH content (3178-ppm) is reported from Harinahalli village in Hunsur Taluk.

Calcium Hardness (CalH)

In the entire district, higher CalH content ranging from 200.08 to 1280 ppm is recorded in 1699 samples spread across 603 villages / habitations. The ranges of higher CalH values in different taluks are Heggadadevanakote 200.8-300 ppm (10 samples), Hunsur 201-900 ppm (249 samples), Krishnarajanagara 200.08-1007 ppm (536 samples), Mysore 202-680 ppm (39 samples), Nanjanagud 202-448 ppm (24 samples), Piriyapatna 210-1280 ppm (798 samples) and T. Narsipura 201-415 ppm (43 samples). The highest CalH content (1280 ppm) is reported from Ravandur village in Piriyapatna taluk.

Chloride (Cl)

In the entire district, higher Chloride value ranging from 1001 to 1290 ppm is recorded from only 20 samples covering 15 villages. The ranges of Chloride values in different taluks are- Heggadadevanakote 1021-1290 ppm (6 samples), Krishnarajanagara 1036-1054 ppm (2 samples) and T. Narsipura 1001-1285 ppm (12 samples). The maximum Chloride content (1290 ppm) is reported from Kalahatti village in Heggadadevanakote taluk. Hunsur, Mysore, Nanjanagud and Piriyapatna taluks have not reported abnormal concentration of Chloride.

Sulphate (SO_4)

In the entire district, only 21 samples covering 16 villages / habitations have SO_4 content more than the permissible limit in the range of 401-899 ppm. The variations in Sulphate content reported in different taluks are Hunsur 429-899 ppm (2 samples) and Krishnarajanagara 406-700 ppm (4 samples), Nanjanagud 480 ppm (lone sample), Piriyapatna 401-760.5 ppm (12 samples) and T.Narsipura 460 ppm (2 samples). Heggadadevanakote and Mysore taluks have not reported abnormal concentration of SO_4.

Fluoride (F)

The analytical data has revealed that, 177 samples from 105 villages / habitations, have shown abnormal Fluoride content in the range of 1.51-4.52 ppm. The concentrational variation reported in different taluks are Heggadadevanakote 1.51-2.5 ppm (21 samples), Mysore 1.51-2.41 ppm (62 samples), Nanjanagud 1.52-4.52 ppm (37 samples) and T.Narsipura 1.51-2.56 ppm (57 samples). Highest concentration of Fluoride (4.52 ppm) is reported from Eregowdana Hundi village in Nanjanagud taluk. Mysore, Krishnarajanagara and Piriyapatna taluks have not reported abnormal concentration of Fluoride.

Nitrate (NO_3)

Higher concentrations of Nitrate in the range of 100.76 to 760.5 ppm are recorded in 890 samples covering 334 villages / habitations. These samples are from the taluks Hunsur 101-650 ppm (480 samples), K.R.Nagar 101-640 ppm (396 samples), Piriyapatna 100.76-317.6 ppm (13 samples) and T.Narasipura 135.1 ppm (the lone sample). Heggadadevanakote, Mysore and Nanjanagudu taluks have not shown abnormal concentration of Nitrate.

Alkalinity (Alk)

Excess alkalinity ranging from 601 to 2251 ppm is recorded in 714 samples covering 371 villages. The range of Alkalinity values in different taluks are Heggadadevanakote 601-815 ppm (80 samples), Hunsur 602-2251 ppm (133 samples), Krishnarajanagara 604-1403 ppm (141 samples), Mysore 602-1008 ppm (140 samples), Nanjanagudu 601-908 ppm (153 samples), Piriyapatna 610-1210 ppm (24 samples) and T. Narasipura 602-801 ppm (43 samples). The maximum Alkalinity (2251 ppm) is reported from Harinahalli village in Hunsur taluk.

Iron (Fe)

A good number of samples, 875 samples from 493 villages/ habitations have analysed excess iron in the range of 1.0038 to 7.4 ppm. The concentration variations of iron in different taluks are Heggadadevanakote 1.01-2.93 ppm (20 samples), Hunsur 1.0038-7.4 ppm (376 samples), Krishnarajanagara

1.0038-3.5 ppm (240 samples), Mysore 1-5.12 ppm (111 samples), Nanjanagudu 1.01-2.73 ppm (35 samples), Piriyapatna 1.006-3.9 ppm (87 samples) and T. Narasipura 1.07-1.88 ppm (6 samples). The highest Fe value of 7.4 ppm is recorded from Halebidu village from Hunsur taluk.

Bacteria *(E.coli)*

In all 895 samples covering 689 villages have shown the presence of Bacteria.The bacterial count generally varies between 1 to 400 No.s/100 ml of water. The bacterial counts reported in different taluks are Heggadadevanakote 1-280 No.s/ 100ml (58 samples), Hunsur 1-127 No.s /100ml (152 samples), Krishnarajanagara 1-157 No.s/100 ml (121 samples), Mysore 1-32 No.s / 100 ml (46 samples), Nanjanagudu 1-400 No.s / 100 ml (195 samples), Piriyapatna 1-8 No.s / 100 ml (170 samples) and T. Narasipura 1-345 No.s / 100 ml (153 samples).

5.3 Spatial Variation

Bacteria *(E.coli)*

The map of bacterial incidence indicates that, bacteria are more commonly seen in the analysed water samples in the entire district. Bacterial contamination is point specific and varies considerably.

Fluoride (F)

The isoconcentration map (Fig. 22A) indicates that, few isolated patches of higher fluoride concentrations are seen in Mysore, Nanjanagudu, T.Narasipura and Heggadadevanakote taluks covering southeastern portion of the district.

Total Dissolved Salts (TDS)

The isoconcentration map (Fig. 22B) depicts that; TDS content in Mysore district is almost within permissible limit except few small patches of higher concentration in the northwestern portion.

Total Hardness (TH)

The map (Fig.22C) reveals that, higher concentration is seen in the northwestern portion covering Hunsur and Piriyapatna taluks and few isolated patches around Nanjanagudu and Mysore taluks covering eastern portion.

Iron (Fe)

Isoconcentration map (Fig.22D) reveals that, segregated patches seen around Hunsur and Krishnarajanagara taluks covering northern portion and few isolated

patches seen in Mysore, Nanjangudu and T.Narasipura taluks covering southeastern portion of the district are having higher iron content.

6. Conclusion

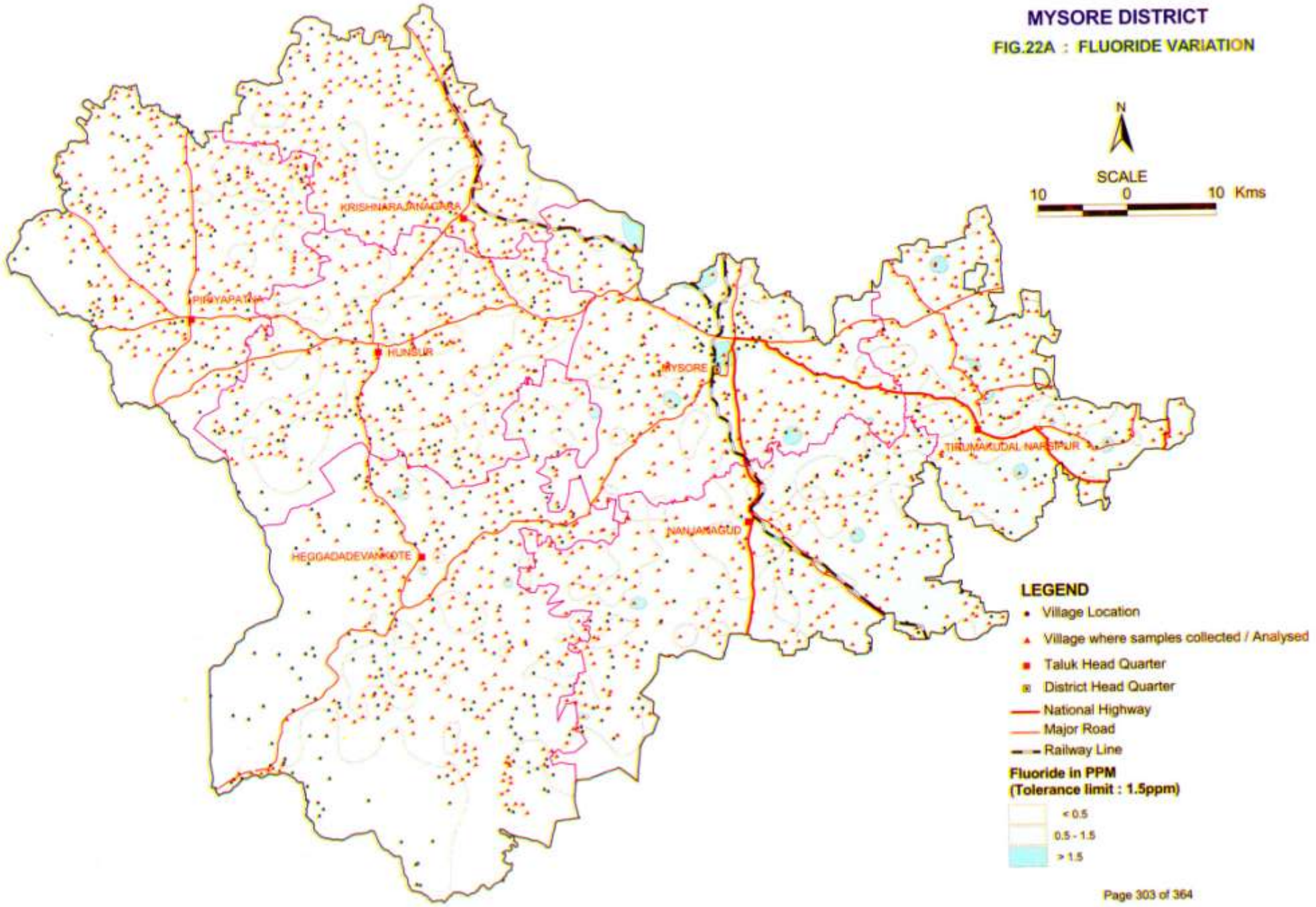
The water quality data of Mysore district has reflected the presence of excess Turbidity, CalH, TH, Alkalinity, Iron and Bacteria. Turbidity can be reduced by simple infiltration. To overcome the problem related to the excess Iron content, an attention is required during the source development such as use of galvanized iron / PVC pipes and proper casing. The most important component, which 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. Probably, these organisms 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 Mysore 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	CalH (200) ppm	Cl (1000) ppm	SO_4 (400) ppm	F (1.5) ppm	NO_3 (100) ppm	Alk (600) ppm	Fe (1) ppm
1	Heggadadevankote	405	282	982	No. of samples beyond permissible limit	58	438	114	-	1	4	59	10	6	-	21	-	80	20
					No. of villages affected	53	208	84	-	1	4	43	8	5	-	16	-	58	15
					Range	1-280	11-587	26-95	125-4240	6.4	2049-2746	602-1384	200.8-300	1021-1290	-	1.51-2.5	-	601-815	1.01-2.93
2	Hunsur	327	276	1142	No. of samples beyond permissible limit	152	130	80	-	5	97	389	249	-	2	-	480	133	376
					No. of villages affected	135	97	69	-	5	62	168	126	-	2	-	181	86	196
					Range	1-127	11-192.2	30-200	300-6500	6.4-8.8	2010-4342	605-3178	201-900	-	429-899	-	101-650	602-2251	1.0038-7.4
3	Krishnarajanagara	232	198	992	No. of samples beyond permissible limit	121	100	75	-	1	66	134	536	2	4	-	396	141	240
					No. of villages affected	106	72	51	-	1	36	63	158	2	4	-	140	69	115
					Range	1-157	10.1-79.2	30-1250	80-5500	8.7	2010-3685	602-1320	200.08-1007	1036-1054	406-700	-	101-640	604-1403	1.0038-3.5
4	Mysore	267	206	1346	No. of samples beyond permissible limit	46	394	95	-	19	46	253	39	-	-	62	-	140	111
					No. of villages affected	37	138	57	-	15	25	89	24	-	-	39	-	60	69
					Range	1-32	11-442	26-121	157-4280	8.6-9.8	2004-2976	601-1356	202-680	-	-	1.51-2.41	-	602-1008	1-5.12
5	Nanjangud	280	232	1278	No. of samples beyond permissible limit	195	290	162	-	5	53	156	24	-	1	37	-	153	35
					No. of villages affected	131	138	100	-	4	32	76	19	-	1	19	-	59	28
					Range	1-400	11-814	26-136	128-5040	8.6-8.8	2004-3485	601-1176	202-448	-	480	1.52-4.52	-	601-908	1.01-2.73
6	Piriyapatna	306	284	1252	No. of samples beyond permissible limit	170	359	34	-	6	19	316	798	-	12	-	13	24	87
					No. of villages affected	126	165	30	-	4	17	145	235	-	8	-	12	16	64
					Range	1-8	10.1-500	30-150	30-150	4.2-8.56	2004-3844	610-1940	210-1280	-	401-760.5	-	100.76-317.06	610-1210	1.006-3.9
7	T.Narsipura	211	190	1077	No. of samples beyond permissible limit	153	308	80	-	-	40	80	43	12	2	57	1	43	6
					No. of villages affected	101	129	51	-	-	24	48	33	8	1	31	1	23	6
					Range	1-345	11-783	26-218	207-9170	-	2011-6278	602-1438	201-415	1001-1285	460	1.51-2.56	135.1	602-801	1.07-1.88
	Total	2028	1668	8069	No. of samples beyond permissible limit	895	2019	640	0	37	325	1387	1699	20	21	177	890	714	875
					No. of villages affected	689	947	442	0	30	200	632	603	15	16	105	334	371	493
					Range	1-400	10.1-814	26-1250	30-9170	4.2-9.8	2004-6278	601-3178	200.08-1280	1001-1290	401-899	1.51-4.52	100.76-650	601-2251	1.0038-7.4

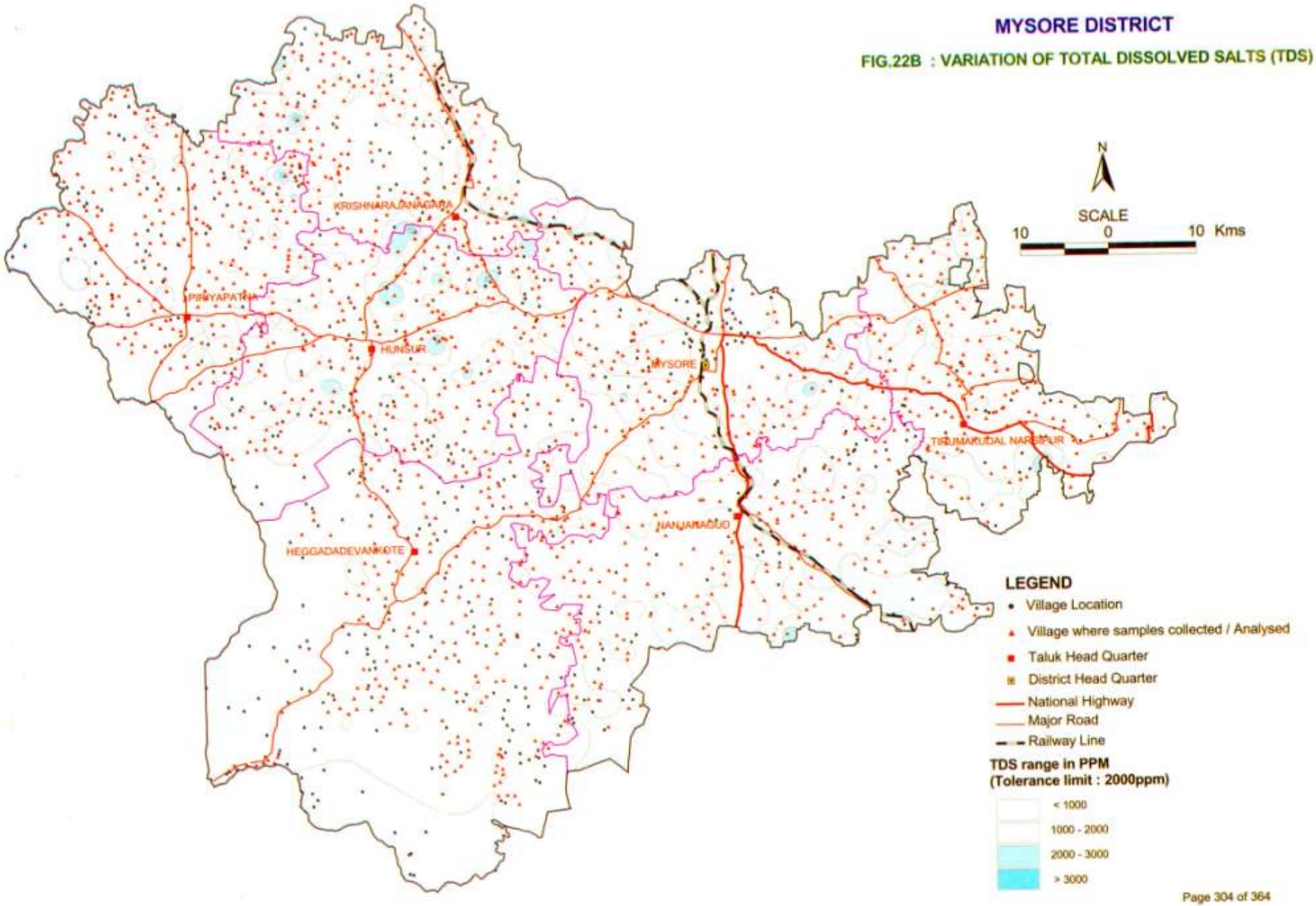
MYSORE DISTRICT

FIG.22A : FLUORIDE VARIATION



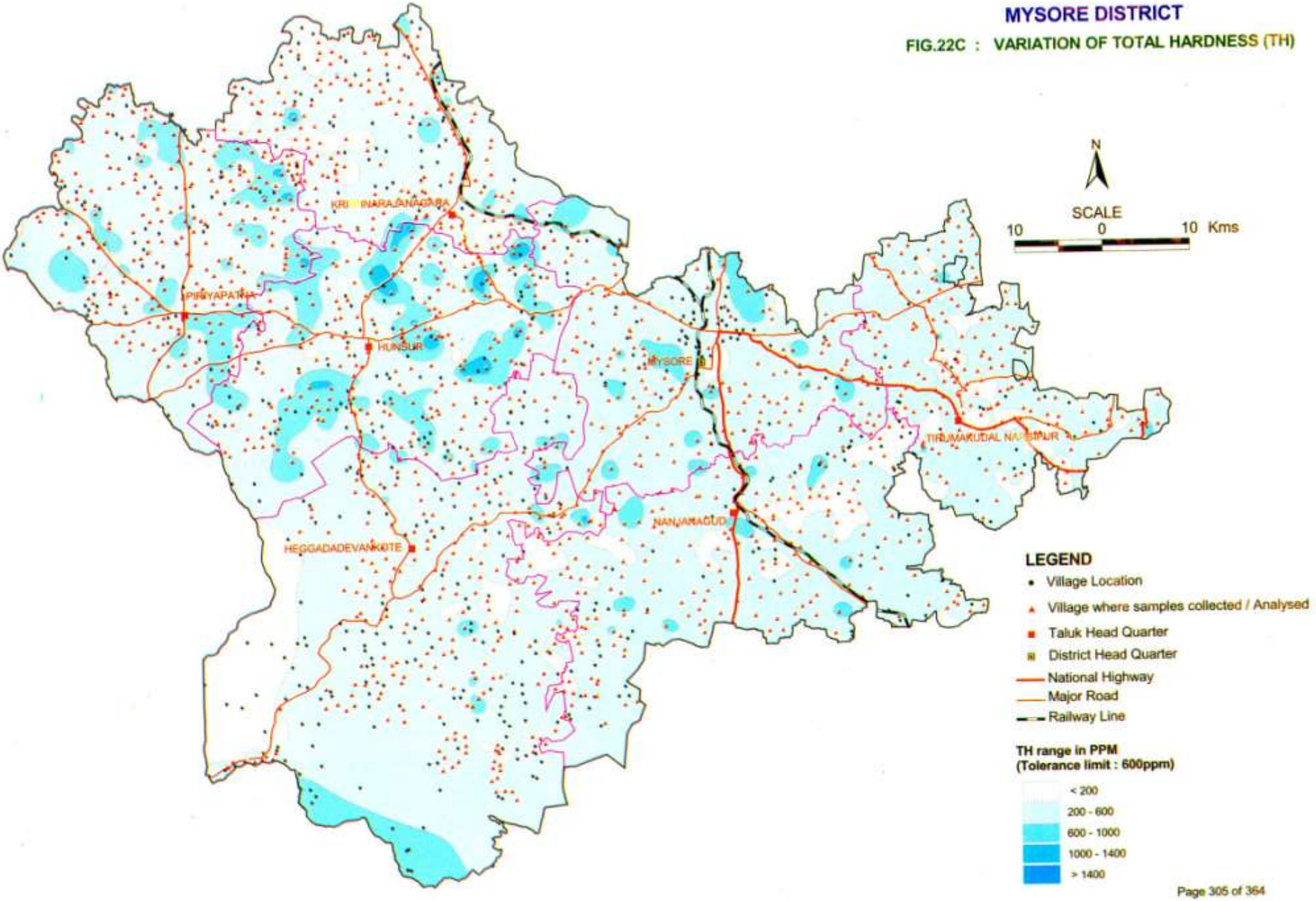
MYSORE DISTRICT

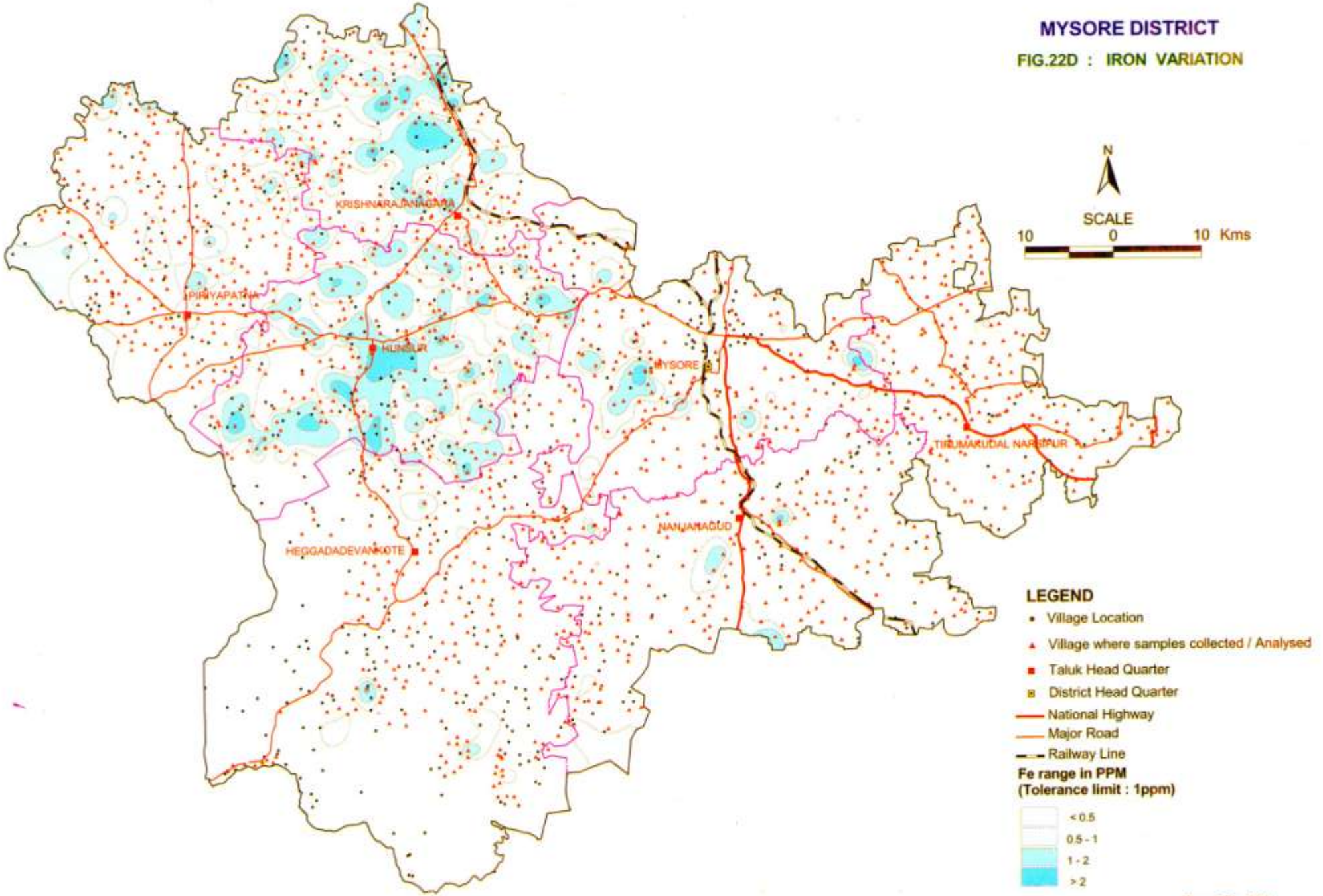
FIG.22B : VARIATION OF TOTAL DISSOLVED SALTS (TDS)



MYSORE DISTRICT

FIG.22C : VARIATION OF TOTAL HARDNESS (TH)




MYSORE DISTRICT
FIG.22D : IRON VARIATION
N
SCALE
10 0 10 Kms
KRISHNARAJANAGARA
PIRIYAPATNA
HUNSUR
MYSORE
TIRUMAKUDAL NARSIPUR
NANJANAGUD
HEGGADADEVANKOTE
LEGEND
Village Location
Village where samples collected / Analysed
Taluk Head Quarter
District Head Quarter
National Highway
Major Road
Railway Line
Fe range in PPM
(Tolerance limit : 1ppm)
< 0.5
0.5 - 1
1 - 2
> 2