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## GROUND WATER SCENARIO IN CHAMARAJANAGAR DISTRICT, KARNATAKA STATE,INDIA

A. N. Mahadevprasad<sup>1</sup> and Dr. P. Jayashree<sup>2</sup>

<sup>1</sup>Teacher Fellow (FDP),DOS in Geography , Manasagangotri,Mysuru.

<sup>2</sup>Associate Professor ,DOS in Geography , Manasagangotri ,Mysuru.

### ABSTRACT :

**T**he ground water scenario of chamarajanagar district deals with the geohydrological status. The study analyses the relationship of climate the ground water level. The ground water development of the district varies from taluk to taluk. Over exploitation results in the depletion of ground water and the deterioration of quality in the district. This article reveals with the problems and recommendations through tables, maps diagrams. The study made an attempt to know status of ground water and helps the economic planners, hydrologists, agriculturists district administrative department etc.,

**KEY WORDS:**Scenario, Geohydrology, Depletion, Deterioration, Exploitation.



### INTRODUCTION:

Chamarajanagar district is situated in southern part of Karnataka. The district is well connected with Tamilnadu & Kerala states. Topography of the district is undulating and mountainous in the east. The rest of the area is partly maidan. The district is famous for sandalwood and granite. The climate of the district is fairly hot summer and cold winter. It experiences a temperature of about 16c-34c & receives a rainfall about 750mm. The district drained by two non perennial rivers viz., Suvarnavathi and Chikkahole. Nearly 34% of total geographical area is under irrigation. Of which well irrigation is dominant. Most part

of the district is facing the problem of water due to the scanty rainfall. The depth of ground water level ranges between 2mbgl to 10mbgl.

### OBJECTIVES

1. To analyze climatic condition of the study area
2. To identify the level of ground water in the district
3. To examine the seasonal and regional ground water level
4. To evaluate the increase level of ground water through the artificial recharge methods and water conservation

### METHODOLOGY

1. The data has been collected from the

primary and secondary sources.

2. The study is based on secondary data from district statistical office and Zilla Panchayat.

3. The data is also collected from the hand book of Central Ground Water Board and the department of mines and geology.

4. This research paper has been analyzed through tables, maps diagrams.

### STUDY AREA

The district is located in the southern tip of Karnataka state. It lies between 11° 40' 58" and 12° 6' 32" North latitude & 76° 24' 14" and 77° 46' 55" East longitude. Total geographical area of district is 5,101 Sq. kms. It constitute about 2,96% of the states area. The district is bounded by Salem & Coimbatore in the East, parts of Mysore district in the West, Nilgiris district in the south, Mandya and Bangalore district in the North. The entire district is in one

administrative division. There are four taluks in the district viz., Kollegal, Yalandur, Chamarajanagar & Gundlupet. The district With 509 villages and 120 village Panchayats. Total population of the district is 1020962 according to 2011 census. It accounts about 1.67 % of the district.



Fig.1. Location map of the study area

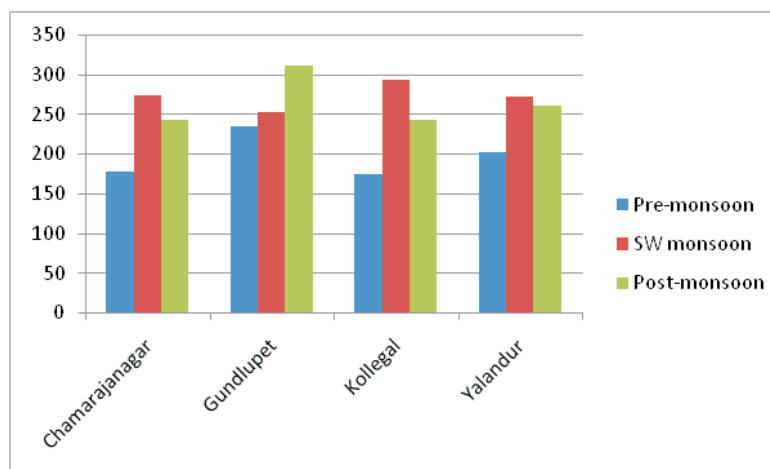
**CLIMATE**

The district experiences tropical monsoon climate with fairly hot summer and cold winter. The range of temperature is 16.4°C to 34°C. The relative humidity ranges from 69% to 85% in the morning and 21% to 70% in the evening. The average rainfall in the district is 751mm. The regional distribution of rainfall reveals Gundlupet taluk 832mm. Yalandur 792mm. Chamarajanagar taluk 679mm. Kollegal taluk 587mm. during 2011 The seasonal distribution of rainfall varies i.e., 36% during pre-monsoon, 37% during SW monsoon and 27% during pre-monsoon period. The average annual rainy days are 54.

**Table -1 Shows actual annual, regional and seasonal distribution of rainfall**

Rain fall in mm						**Av. Annual rainy days
Sl.No	Station	Pre-monsoon	SW-monsoon	Post-monsoon	Total	
1	Chamarajanagar	178	275	243	656	59
2	Gundlupet	236	253	313	802	55
3	Kollegala	175	294	243	712	46
4	Yalandur	202	273	262	737	54
	Av.	198	274	265	737	54

.Source: District Statistical glance



### GROUND WATER RESOURCES AND STATUS OF GROUND WATER DEVELOPMENT

The Net annual ground water availability is 34187 ham and The Gross Ground water draft for all uses is 24558ham. The Ground water availability for future irrigation Development is 12740 ham. The average stage of G.W.D of the district is 72%. The taluk wise ground water availability and the stage of ground water development are shown in the table. The stage of ground water is highest in Gundlupet taluk i.e., 134%. Of which 50% is safe, 25% is semi-critical and 25% is over exploited. Chamarajanagar and Yalandur taluks have 61% 69% ground water development respectively. The stage of ground water falls under safe category i.e., 100% in Yalandur taluk where as 97% in safe category and 3% is semi critical in Chamarajanagar district. The stage of ground water is lowest in Kollegal taluk i.e., 46%. Out of which 65% falls under safe category 35% is under over exploited.

**Table 2 Taluk wise Ground water Resource of Chamarajnanagar District (March 2009)**

Taluk	Net annual ground water availability	Existing gross ground water draft for irrigation	Existing gross ground water draft for domestic and	Existing gross ground water draft for all uses	Allocation for domestic and industrial use for next 25 years	Net ground water availability for future irrigation	Stage of GW development	Stage of ground water development(%)			
								Safe (%)	Semi-critical (%)	Critical (%)	OE (%)
								HAM	HAM	HAM	HAM
Ch.Nagar	10831	6062	589	6651	505	3863	61	67	03	-	-
Gundlupete	7553	9235	857	10092	929	1018	134	50	25	-	25
Kollegal	13412	5617	557	6174	764	7286	46	65	-	-	35
Yalanduru	2391	1490	151	1641	328	573	69	100	-	-	-
Total	34187	22404	2154	24558	2926	12740	-	-	-	-	-

#### STATUS OF GROUND WATER DEVELOPMENT

##### CHAMARAJANAGAR TALUK

The stage of G.W.D is 61% of which 97% is under safe and 3% is under Semi-critical category. The taluk has 9720 bore wells and 175 dug wells for irrigation. The potential fractured aquifers are encountered between 18m-165m depth which yields of less than 1lps-6.12lps

##### GUNDLUPET TALUK

The stage of G.W.D is high i.e., 134% of which 50% is under safe, 25% is under Semi-critical category and 25% is under over-exploited category. The taluk has 7275 bore wells and 75 dug wells for irrigation. The potential fractured aquifers are encountered between 36m-151m depth which yields of less than 1 lps – 10lps

##### YALANDUR TALUK

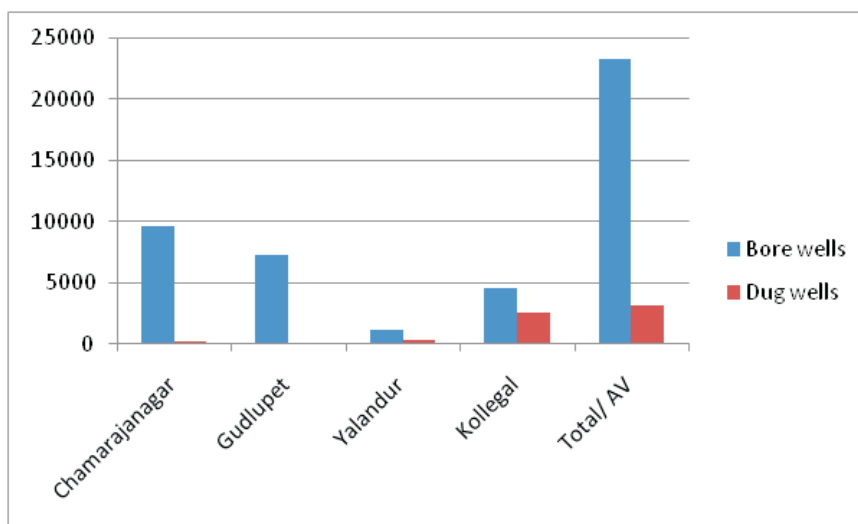
The stage of G.W.D is 61% of which 97% is under safe and 3% is under Semi-critical category. The taluk has 1221 bore wells and 338 dug wells for irrigation.

##### KOLLEGAL TALUK

The stage of G.W.D is 61% of which 97% is under safe and 3% is under Semi-critical category. The taluk has 4632 bore wells and 2570 dug wells for irrigation. The potential fractured aquifers are encountered between 18m-165m depth which yields of less than 1lps-6.12lps.

**Table: Talukwise Bore wells, Average Depth and Yield of Ground water in Chamarajanagar District**

Taluk	Bore wells	Dug wells	Average Depth (m)	Yield (lps)
Chamarajanagar	9720	175	18-165	1-6.12
Gudlupet	7275	75	36-151	1-10.00
Yalandur	1221	332	16-120	1-12.00
Kollegal	4632	2570	18-165	1-6.12
Total/ AV	23349	3158	22-150	1-8.56



### PROBLEMS OF GROUND WATER:

The water table has been depleted considerably in the last decade. Several pockets of the district have facing the problem of excessive fluoride and nitrate. Over exploitation, erratic rainfall, high surface run-off, poor percolation are the severe causes in the depletion of ground water. Drinking water scarcity exists in the entire district. Ground water source depletion, quality deterioration and soil salinity are the major issues in the district. Ground water scarcity is on higher level in over exploited areas of Gundlupet and Kollegal taluks and non-command areas of Yalandur & Chamarajanagar taluks. High nitrate due to anthropogenic activities and use of nitrogenous fertilizers in canal command areas are found in several areas of the district.

### RECOMMENDATIONS

1. Adopting watershed treatment is good option in augmenting the natural recharge.
2. Development of ground water is to be under taken cautiously in semi-critical areas.
3. Ground water augmentation measures artificial recharge concentration of percolation tanks and watershed treatments should be implemented in ground water resource depleted areas.
4. Abandoned bore wells and dug wells can be utilized for recharging water with surplus run-off during rainy days under dug well recharge schemes.
5. The proper cropping pattern, crop- water management and adopting water economy irrigation practices should be implement in ground water management.
6. In canal command areas rise in ground water level should be checked to avoid water logging salinity problems.

### CONCLUSION

The study has been analyzed the status of ground water effectively. It denotes the sources level quality and exploitation of ground water in the district. Further the paper is pointed out the inter -relationship of physiographic climate, source of ground water and agriculture. This study recommended the improvement of

ground water through the artificial recharge methods and thus it helps the growth of agriculture and supply of drinking water in the district.

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