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Assessment of Ground Water Potential in Krishnagiri District, Tamil Nadu

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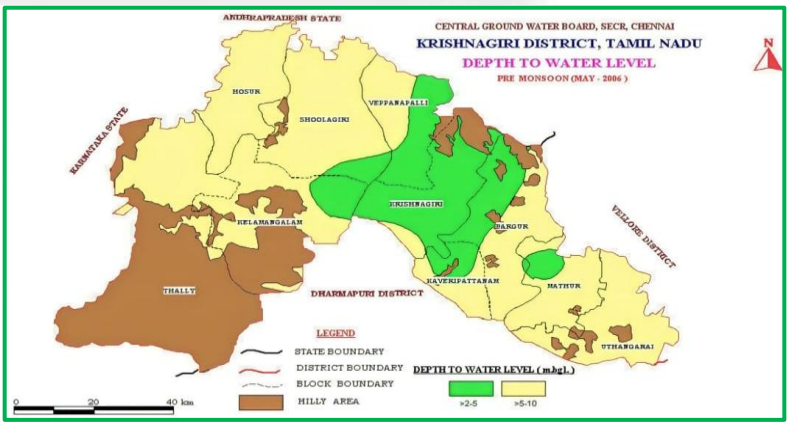
Abstract
The study reveals that the magnitude of annual rainfall and groundwater potential has a decreasing trend. The discharge rate is more than the recharge rate, leading to depletion of the groundwater level. The critical drawdown and Safe yield have also been determined. Groundwater exploration through drilling was first taken up by Central Ground Water Board in Krishnagiri District between 1988 and 1990 A number of borewells have been drilled in the district various state Government agencies. As the development of groundwater has already reached a high stage in four blocks of the district, further development of groundwater for creation of additional irrigation potential has to be carried out with extreme condition.

Key Words: Groundwater, quality, water conservation, issues.

Introduction
Groundwater is increasing day by day for various purposes. Availability of surface water is more when compared to the surface water. With increase in population leading to the increase in water requirements. The irrigation sources in the district are dug wells tanks, canals and bore wells. Dug well irrigation is highest in uthangarai block followed by kaveripattam.

Groundwater Resources
1. **Hydrogeology:** Krishnagiri district is under Archean crystalline formation with recent alluvial deposits of limited area extent and thickness along the courses of major rivers. The movement of Ground water is controlled by various factors such as Physiography, Climate, Geology and Structural features. The yield of successful exploratory wells drilled in the district ranged from 0.78lps to 26lps. The specific capacity of the wells ranged from 1.2 to 118.0 lpm/m/dd. The piezometric head of fracture zones varied between 0.50 and 18.45 m bgl.
2. **Soils:** Soils have been classified into Black soil, Mixed soil, Red loamy soil, Gravelly and sandy soils . Loamy and black soils occur in Krishnagiri



district. The district receives the rain under the influence of both southwest and northeast monsoons. The normal annual rainfall over the district varies from about 750 to about 900 mm. It is the minimum Hosur and Rayakottai in the northern and central parts of the district. It gradually increases towards west and east. The areas which have coarse granule, coarse sandy loam , and loamy sand are high potential of groundwater infiltration.

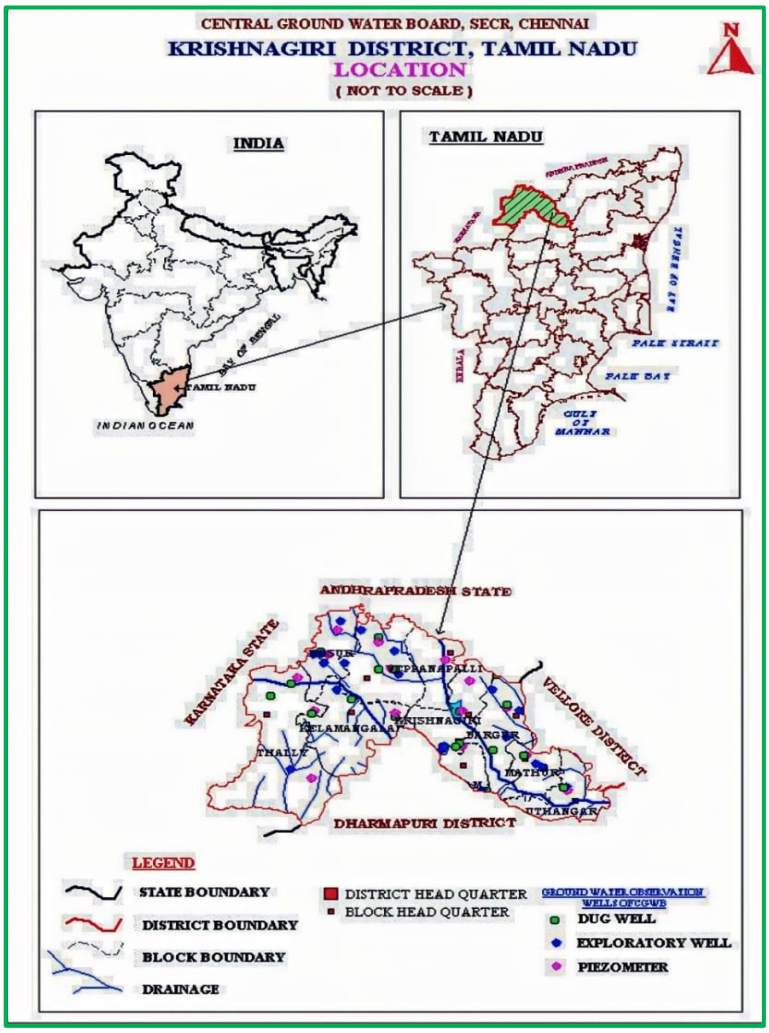
Irrigation Practices

The block wise and source wise net irrigated are (ha) is given below :

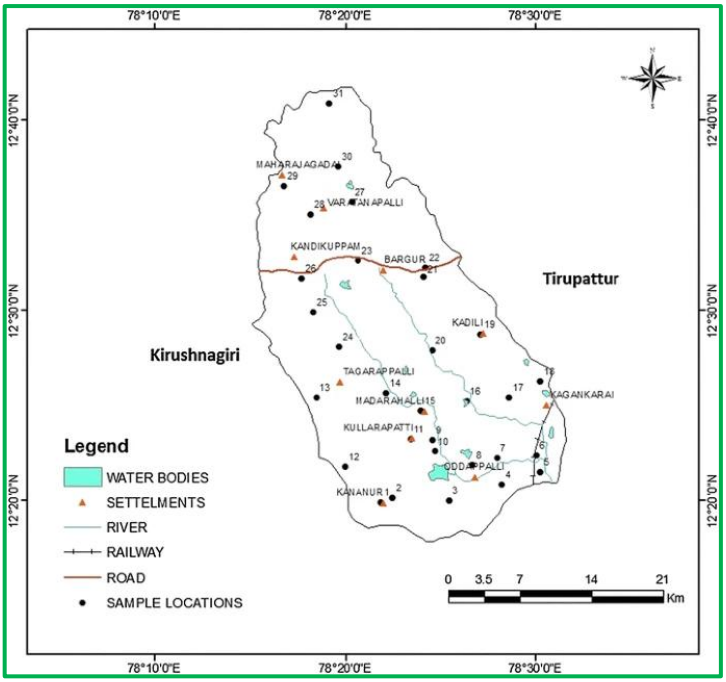
S.NO	BLOCK	CANALS	TANKS	BORE WELLS	DUG WELLS	OTHERS
1.	Bargur	56	892	-	7945	-
2.	Hosur	55	749	-	3087	35
3.	Kaveripattanam	2575	911	-	6403	13
4.	Krishnagiri	1269	1793	23	2051	-
5.	Shoolagiri	106	1118	-	3402	180
6.	Uthangarai	231	612	-	7928	-
7.	Veppanapalli	144	637	-	3127	83

Ground Water Quality

- Ground water in phreatic aquifers in Krishnagiri district, in general, is colorless, odorless and predominantly alkaline in nature. The specific electrical conductance (EC) of groundwater in the phreatic zone (Micro Siemens at 25°C) during May 2006 was in the range of 830 to 3030 in the district. In about 67% of the samples analyzed the ground water is of average quality with EC less than 2250.
- It is observed that the ground water is suitable for drinking and domestic uses in respect of all the constituents except total hardness, fluoride and nitrate in about 67.85 and 50% of the samples. Total hardness as CaCO3 is observed to be in excess of permissible limits in 33% of the samples analyzed, whereas nitrate is found in excess of 45 mg/l in about 50% of samples. Excess fluoride more than the permissible limit of 1.5 mg/l is observed.



Water Conservation



CCWB had prepared a master plan to groundwater potential by saturating the shallow aquifer taking into consideration the available unsaturated space during post monsoon and surplus runoff. Computations have been made for Drought Prone Area Program (DPAP) for over exploited and critical blocks in the districts warranting immediate attentions. State government agencies have constructed artificial recharge structures with their own fund or fund from central government, dovetailing various government programs. There is considerable scope for implementation of roof – top rainfall harvesting in the district. Recharge pits / Shafts / trenches of suitable of suitable design are ideal structures for rainwater in such areas. Central Groundwater board is also providing free technical guidance for implementation of root top rainwater harvesting schemes.

Post Monsoon Water Quality Index

During post monsoon the water quality will range from poor to excellent. It is found that wells located in the west and south east study area fall under poor quality. Water quality index of the study varied from 6.2 to 177.91.

S.NO	WATER QUALITY INDEX	STATUS
1.	0-25	Unfit for drinking
2.	26-50	Very Poor (Moderately Polluted)
3.	51-75	Poor
4.	76-100	Good
5.	>100	Excellent

Pre-Monsoon Water Quality Index

The basin wise spatial distribution of decadal water quality index showed that the wells located in the central part of study area of poor quality. Pre monsoon water quality index of the study varied from 10.72 to 271.15.

Groundwater Related Issues

Board has provided a number of villages in the district with fluoride free drinking water supply. The industrial development in KRISHNAGIRI have made vulnerable to pollution and necessary preventive measures are to be taken to ensure that industrial effluents are properly treated before discharge. The source of Fluoride in groundwater is the fluoride bearing minerals present in the granitic gneissic and granites.

Conclusion

Gound water is essential for all the purposes. In the study that there was a gradual increase in water level with increase in rainfall from the year 1992 – 2003. However, there was a

decrease in water level from the year 2004 – 2006. This clearly indicates that there was groundwater depletion due to over – exploitation.

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