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Hydro Geological Scenario of Dharamshala City District Kangra, Himachal Pradesh

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***Abstract*: This paper presents an overview of Hydro geological scenario of dharamshala city district kangra, himachal Pradesh.**

***Keywords*: Hydrogeology, Bowries, Dharamshala, Kangra, Himachal Pradesh.**

1. Introduction

Dharamshala is a city and a municipal corporation in Kangra district is surrounded by cedar forests on the edge of Himalayas, this hillside city is home to the Dalai Lama and Tibetan Government in exile. It was formerly known as Bhagsu. It has an area of 27.6 km2 and the population of 30,764 persons as per the Census 2011. It is located on 32.21900N and 76.32340E. The water supply in the city is under the control of Irrigation and Public Health Deptt. and the mostly dependent on the surface water by constructing infiltration galleries at the source. The shallow borewells fitted with handpumps and tubewells also exists at few places to fulfil the need. The I&PH Deptt has tapped number of good yielding springs which are perennial and water supply schemes are based on these springs. Generally, these springs are tapped at the source so that the water can be supplied under gravity. The major demand of water is in the summer season when the tourist flows are more. There is no any industrialization exists in Dharamshala till date, except few small tea factories. The ground water resources of the city have not been computed because the entire area is hilly and having slope more than 20%. The main objective of this paper is to give the ground water development strategy to fulfil the water demand in the smart city, Dharamshala, Himachal Pradesh.

2. Methodology

The main ground water structures in Dharamshala areas are spring water, shallow bore wells fitted with hand pumps and 2-3 tube wells. The area is devoid of any dug wells piezometers, therefore the water level could not be monitored by CGWB or any other agency. However two water samples have been collected and the results observed are as given below:

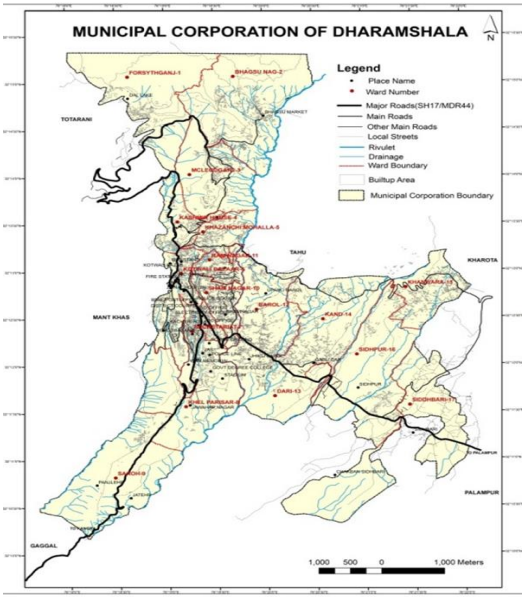

Fig. 1. Municipal Corporation of Dharamshala

3. Hydrogeological Frame Work

The There are three geological units namely Pre-tertiary, Tertiary and Post-tertiary Formations. The Pre-tertiary Formations are exposed to the north of Dharamshala. The MBT separates the Pre-tertiary with the Tertiary to the south. The Tertiaries comprise of Shali, Sundernagar and Chail Formations comprising of limestone, quartzite and Schist respectively. The limestone bands are sandwiched between the Tertiary in the south and Dharamshala and Chandpur Formation in the north. The age of this limestone is said to be Late Permian-Triassic (Gupta and Thakur, 1974). The Tertiary Formation covers a large area of the Kangra valley and lie in a comparatively lower topography. The Subathu Formation lies to the north of Dharamshala and consists of shale and limestone. This is

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Table 1
Dharamshala areas

Village / Location	PH	EC (us/cm)	TA	TDS	TH	Ca	Mg	Na	K	CO3	HCO3	CL	SO4	NO3	F
			(mg/l)												
Garoh 1	7.49	240	85	127	100	30	6	6.4	0.6	0	104	18	2	2	0.09
Garoh 2	7.71	1550	40	822	55	16	3.6	10	1.4	0	49	14	13	6.15	0.06

From the above results it is observed that ground water is potable and within the permissible limit of BIS drinking water standards (IS 10500: 2012).

Table 2
Hydrogeological frame work

S.no	Location/ Co-Ordinates	Depth Drilled (m bgl)/ Year of completion	Depth (m)/ Dia of Assembly (mm)	Aquifers Tapped (m bgl)	SWL (m bgl)	Discharge (lpm)/ Drawdown (m)	T (m^2/ day)	Quality of Water EC/Cl (µmhos/ cm at 25^0/ mg/l)	Formation	Basin/ Sub-Basin
1.	Sidhwari 32^0 11' 12" 76^0 22' 13"	62.4 2001	62.0 203/152	36-40 45-51 55-61	1.88	757 23.39	47.56	EC:100 Cl:14	Morainic Deposit	Indus/ Beas
2.	Dari 32^0 12' 00" 76^0 20' 15"	71.0 2002	71.0 203/152	50-52 55-70	5.86	1329 8.27	270.00	-	Morainic Deposit	Indus/ Beas
3.	Churan-I $32^0$08'12" $76^0$20'05"	86.17 2004	86.00 204/152	37-40 50-62 65-71 77-83	17.59	- 13.5		EC: 238 CL: 22	Glacial Morains	Indus/ Beas
4.	Churan-II $32^0$07'42" $76^0$24'15"	122.27 2004	204/152	57-66 69-75 80-83 92-98	23.23	7.2 26.82	7.277	-:	Glacial Morains	Indus/ Beas

believed to be of Eocene age. The Lower, Middle and Upper Siwaliks lie conformably with each other. Granite is the principle component of the Dhauladhar range. The mornanic deposit overlies above these formations and are the water bearing formations.

There are no dug wells in the area because of hilly nature of the terrain as such no water level record is available. Irrigation and Public Health (I&PH) department, Govt. of Himachal Pradesh have drilled shallow bore wells (hand pumps) to provide water for domestic use. These hand pumps have been drilled between the depth ranges of 50-90 m. The static watr level (SWL) of hand pump constructed in the city varies between 10 to 30 m bgl and discharge varies from 0.14 lps to 1.37 lps. To know the aquifer system of the hard rock, Central in Dharamshala Municipal Corporation area. The details of these wells are given below: The tube well was constructed upto the depth of 122 m and yielded low discharge at Charan Khad and a maximum discharge of 1339 LPM at Dari ground with a transmissivity of 270 m^2 /day.

Ground Water Board, NHR, Dharamshala has drilled tube wells.Dissolved solids from sewage, landfills or improper dumps, including organic compounds thrown into trash can affect groundwater. Thus, there is a need of scientific management of the dumping site to prevent ground water contamination and the regular monitoring of the ground water in and adjoining areas of landfill dumping site is also required. Rainwater harvesting is an important aspect of water conservation and management as it provides a cost effective means of collection and storage of water for use during the water deficit period. Bestowed with high rainfall, Dharamshala area face water scarcity during the lean period. It is not always feasible to construct ponds/lakes/reservoirs in the city due to the cost of land and urban development pressures. One pilot project studies under Central Sector Scheme during X Plan for Artificial recharge to ground water through check dam at Piyungal nala, near Skoh, has been constructed and impact assessment has been initiated.

4. Conclusion and Recommendation

In the city area, emergence of ground water through the traditional sources viz. Springs (chasmas), Bowries occurs. The banks of perennial streams are the only possible development of ground water resources at favourable locations. Proper development of springs is essential as it is observed that most of the spring does not have collection chamber or tanks from where water can be distributed under gravity. Similarly, seepage springs along hill sides also need to develop for harnessing ground water in such areas. In the last decade number of shallow bore wells fitted with hand pumps has been constructed in these areas serving as the source of water supply for domestic uses in the city. Due to hilly terrain only shallow bore wells at favorable locations are feasible. However, looking to the fragile eco-system drilling activity should be minimum. Perennial khads are the major source for domestic water supply in city areas. In most parts the availability of water during summer is limited particularly in drought/ low precipitation. There is thus immediate need to conserve and augment water resource. Based upon the climatic conditions, topography, hydro-geology of the area, suitable structure for rain water harvesting and artificial recharge to ground water body need to

be planned and implemented. Roof top rainwater harvesting area need to be adopted and proper scientific intervention for spring development and revival of traditional water storage is required in water scarce hilly upland areas. The area receives fair amount of rainfall & ample scope exist for implementing roof top rain water harvesting by constructing appropriate harvesting structures. Such structures should be replicated to conserve and augment water resources. Installation of rain water harvesting system should be made mandatory for all buildings to be constructed in the area and no building plan without rain water harvesting system can be approved. There is a need of scientific management of the dumping site to prevent ground water contamination and the regular monitoring of the ground water in and adjoining areas of landfill dumping site is also required.

References

[1] www.mcdharamshala.in
[2] Dharamshala Population Census, 2011.
[3] Ground Water Information Booklet, Kangra district-2013.
[4] Ground Water exploration report, 2012-13, CGWB, Dharamshala.