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REVIEW ARTICLE

ANALYSIS OF WATER RESOURCES IN MAHENDERGARH DISTRICT

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Analysis of Water Resources in Mahendergarh District

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INTRODUCTION

Water has emerged as a resource of strategic importance because of its increasing demand in agriculture, domestic and industrial uses. Its adequate and continuous supply is essential to provide stability in food production and self-sufficiency to societies (GWC 2013). Increased demand for water has stimulated development of groundwater supply. Groundwater has emerged as one of the principal source of water for irrigation in areas where surface (canal) irrigation is either insufficient or prohibitively expensive. Groundwater is a replenish able finite source. It is common pool resource and termed as a heritage for all to manage (Aggarwal et. al 2009 a & b).

Intensive withdrawals of groundwater in excess of natural recharge over the years have affected the environment causing a continuous fluctuation in water table levels. More than half of the world's population is dependent on the groundwater for its survival (omvir and sharma 2010). Water storage is a serious problem in many parts of India including semi-arid region of Southern Haryana. The usable groundwater resource is essentially a dynamic resource which is recharged annually and periodically from rainfall, irrigation returns flow, canal seepage, influent seepage etc. (Chatterjee et. al. 2009).

Southern Haryana, being a semi-arid region with predominant agricultural economy facing a serious problem of water availability these days. In this region (including Mahendergarh district) rainfall is scanty and availability of surface water due to limited canal network is restricted. Water conservation practices are negligible under these situations. Annual net recharge of groundwater in this area has been much smaller than its discharge. Therefore, this region has been facing a challenge to maintain a delicate balance between replenishment and utilization.

STUDY AREA

Mahendergarh district situated in southern part of Haryana. It has a total geographical area of 1899 sq km. and lies between Latitudes 27°47'N to 28°26'N and Longitudes75°56'E to 76°51' E. Mahendragarh district territory touch to Bhiwani, Charkhi Dadri and Rewari districts in its north, Alwar and Jhunjhunu (Rajasthan) districts in its south and west respectively. Administratively, the district is divided into three sub divisions, namely Mahendragarh, Narnaul and kanina. There are eight development blocks in the area namely Ateli, Kanina, Mahendragarh, Nangal Choudhary and Narnaul, Sihma, Nizampur and Satnali. The district is comprised of 370 villages and 5 towns with the population of 9,21,680 souls as per 2011 census.

WATER RESOURCE IN MAHENDERGARH DISTRICT

The major forms of water resources used in the district are Tube wells and canal, including lift irrigation projects. The reverse slope of the region makes the conditions unfavorable here for the development of canal systems. Canal are mostly laid down according to slope so as no additional force is required to easily flow of water. But the slope in entire south and south west Haryana including district Mahendergarh is towards north and north east. Apart from general slope the local surface feature are also proved as barriers in the district. Mostly land is undulating and having sand dunes so poses problem for canal development. These topographic conditions of the region forced to depend on ground water resources and particularly deep tube wells for irrigation and other purposes. This sole dependency on tube wells lead to over exploitation and depletion of ground water. The main water sources of the district are as-

RAINFALL

The Mahendergarh district is situated in region of semi-arid climatic conditions. The district received rainfall mainly through south-west monsoon winds, highly varied with space and time. The location of the district is continental; the monsoon winds which reaches for doing rainfall have not much moisture that they can do immense rainfall. The annual rainfall of district is generally about 300- 500 mm. This

rainfall occurs during short spell of about 25 to 43 days. Because of short duration of rain undulating soil surface, most of the rain water tends to flow away rapidly from the fields and leaves a very little scope of recharge of ground water. Though district received the rainfall by western disturbance in winter, the amount is so meager that the soil moisture be hardly retain moisture. There is seen decline in the total annual rainfall received during last three decades, after 1995 the rainfall received gradual decline since 2008. Except year 1976 and 2008, nearly 800.00 mm rainfall, the district received comparatively low amount of rainfall.

RIVER

The river Dohan has its origin in Rajasthan and after flowing after about 29 km in Rajasthan it enters in Haryana. It gradually shrinks as it flow in the district and disappear after flowing some distance. It is not Perennial River but has only sufficient water during the monsoon time periods while during the rest of time it remains almost dry. The increased volume of water in the river during monsoon season has also impact on the surrounding water table and the water level in the surrounding areas of the river also fluctuates with the river. Several first and third order streams which originates as like Dohan from the Aravali ranges and disappear in the sand and foot hill zone of the hills also have significant impact on the water quality and quantity.

CANAL SYSTEM

Narnaul branch and Mahendergarh distributaries of the Jawaharlal Nehru canal Command system makes the chief canal network in the region. The natural slope of surface is from south to north in the canal command area but the direction of flow of water in canal is from north to south by lifting systems. The problem faced by the lift irrigation system in the region is scarcity of source water for canal and it is under capacity and also unscheduled. Though there is scarcity of water in the canal but this project makes a revival of crops in the region and proves very beneficial for the local people.

GROUND WATER RESOURCES:

The district come in the zone of over exploited water resources and due to low rate of ground water recharge than extraction, there is seen serious change in water quality and water table (Jeet, 2010)**.** Ground water quality is measured by the method of electrical conductivity. As the salt is more conducive of electricity and if there is more amount of salt in a fixed volume of water the electrical conductivity of the water will be more in comparison to less saline water. Based on this method ground water is categorized in to four major categories as fresh, sub marginal, marginal and saline.

The block wise ground water resource potential in the district has been assessed as per GEC 97. The stage of ground water development in the district ranges between 49% (block –Narnaul) to178% (block –Kanina). The total repleneshable ground water resource in the district is 21435Ham. The net ground water draft is 22778 Ha.m., thus over exploiting 1343 Ha.m of ground water. The stage of ground water development in the district is 104%.

GROUND WATER RELATED ISSUES

Ground water level decline is the major problem in the district. Though the ground water quality is not a major problem in the area, the declining water level is imposing a major problem in the district. In absence of any major canal network in the district almost complete dependence on ground water for all types of water needs is a major concern. Out of five blocks in the district two blocks namely Nangal Chaudhary and Narnaul have been notified by Central Ground Water Authority for ground water regulation up to the depth of 100 m bgl. Mahendragarh bock of the district has been notified for registration of ground water abstraction structures.

SUGGESTIONS

In conclusion, the district has scarcity of both surface and ground water resources. The principal cause of this scarcity of water resources is the low amount of rainfall. The high transpiration rate and rocky surface which interrupts the process of water recharge are also some other prominent cause responsible for this problem. The rainfall is not in the hand of man but by taking some useful appropriate steps such type of problem can be reduced and sustainability of resource can be keep up. Some useful suggestions are giving below to solve this problem:-

- In order to arrest the declining trend of water levels in the district, the roof top rain water harvesting techniques should be adopted and recharge structure may also be constructed in area of depression where water gets accumulated during rainy season.
- The crops consuming less quantity of water may be grown in the district.
- The abandoned dug wells may be cleared and should be used for recharging ground water utilizing monsoon runoff.
- The canal network in the district should be strengthened.
- Afforestation should be taken up in the district in order to increase the rain fall in the area and subsequently more recharge to Ground water.

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Statistical Abstract of Haryana

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