GROUND WATER MANAGEMENT STRATEGY IN MAHENDERGARH DISTRICT (HARYANA)

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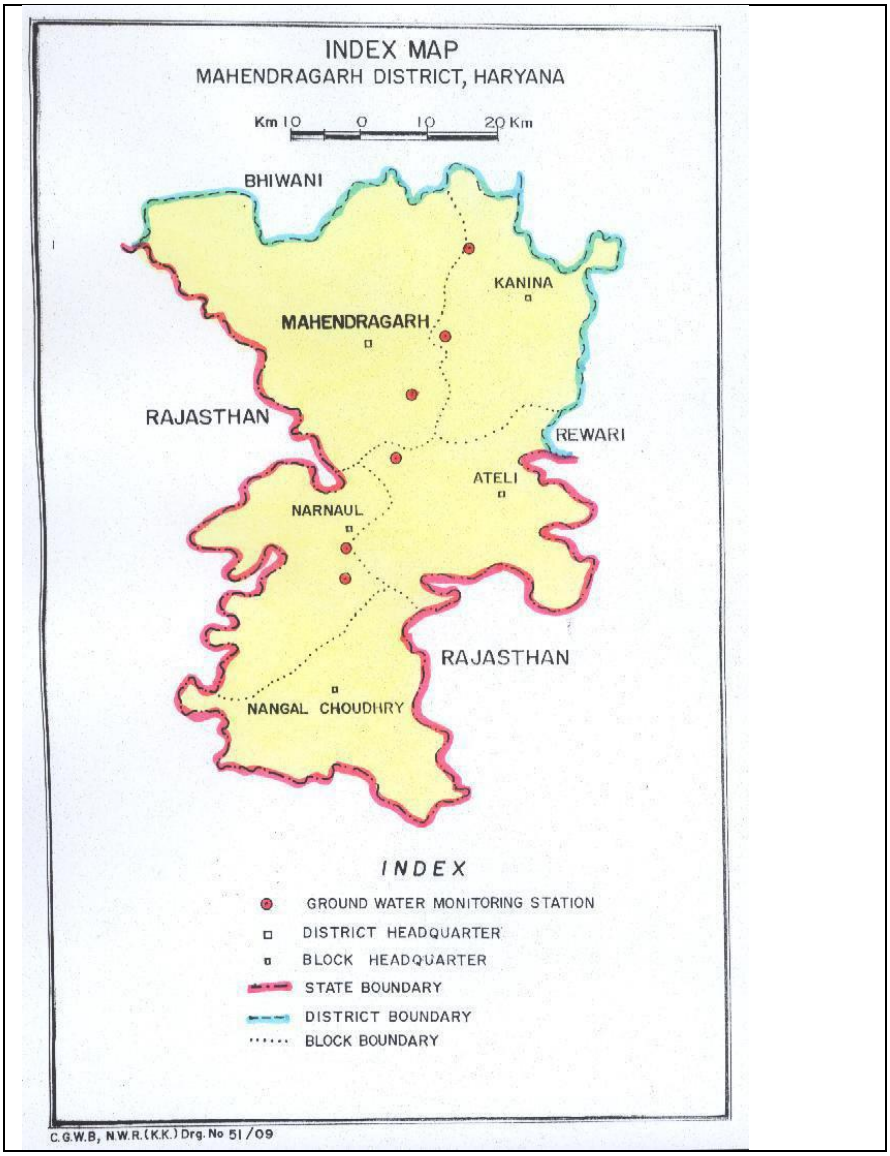
Abstract: *Water is the most vital natural resources for the survival of mankind. In order to have sustained development, water resources have to be managed effectively. For their efficient management, one has to look for suitable unit of management, so that water resources are managed effectively, collectively and simultaneously. Water is not only an essential element for survival of life but also it is an important vehicle for economic development of the nation. Though water is a renewable resource the volume of usable water is limited in the nature. So it is essential to maintain the sustainability of water by adopting proper management technique in its utilization. Haryana is among the most agriculturally developed states in India, where the maximum utilization of water is in irrigation purposes. In the present conditions of climate change there is already stress on food security and further degradation of water resources can become harbinger of starvation and drought in several parts of the nation. The continuously increasing population has put enormous pressure on existing resources.*

Key Words: *Natural Resources, Water Management, Population etc.*

1. INTRODUCTION:

Mahendragarh district occupies the southern extremity of the Haryana state jointly with Rewari and Gurgaon districts of Haryana. It has a total geographical area of 1776 sq km. and falls between Latitudes 27048'10" and 2808'30" and Longitudes 75054' 00" and 76051' 30". Mahendragarh district is bounded by Bhiwani and Rohtak districts in its north, Rewari in its east and Alwar and Jhunjhunu (Rajasthan) districts in its south and west respectively. Administratively, the district is divided into two sub divisions, namely Mahendragarh and Narnaul. 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. Haryana is located in semi arid climatic conditions and lies in the ambit of monsoon rainfall regime. Water availability by rain is limited, varied and untimely. Most of the rains received during only four rainy months of the year from July to September while during rest of the time people have to depend on ground water resources or stored structures. The average annual rainfall of the state is around 455 mm. The spatial patterns of rainfall clearly divide the state climatically in 3 broad regions. The rainfall decreases from north east and north to south and south west. Yamuna is the only perennial river in the state which provides prominent continuous water for the state. Several canal as western Yamuna canal, Gurgaon canal etc. provides water not only for irrigation but also for drinking purposes. Due to continental location the rate of transpiration exceeds the rate of rainfall resulted in to loss of moisture in the soil and loss of productivity.

Normal Annual Rainfall : 500 mm
Normal monsoon Rainfall : 420 mm
Temperature Mean Maximum : 41°C (May June) Mean Minimum : 5.6°C (January)
Normal Rainy days : 26



Further, there is acute shortage of water and ground water resources have been declining drastically in the district. According to Ground water cell of Government of Haryana, 2010, three blocks of the district namely Ateli, Mahendergarh and Narnaul are facing the severe problem of declining groundwater table. Studies have shown that this district has reported maximum annual decline in water table in Haryana which was 39 cm per year from 1974 to 2001. The groundwater table in the area had gone below the bottom level of most of the wells.

2. REVIER OF LITERATURE:

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 resource and development potential of Mahendragarh district is given as under

GROUND WATER RESOURCE AND DEVELOPMENT POTENTIAL (2010)

Assessme nt unit/ block	Net ground water available	Existing ground water draft for irrigation	Existing GW draft for domestic & industrial supply	Existing GW draft for all users	Allocatio n for domestic and industrial supply next 25 yrs	Net GW draft available for future irrigation develop ment	Stage of GW deve lop ment (%)
Ateli	3881	3422	70	3492	90	369	90

Narnaul	3726	1694	116	1715	108	1924	49
Kanina	4673	8266	44	8310	44	-3636	178
Mahendraga rh	5004	5140	82	5222	82	-219	104
Nangal Choudhary	4151	3931	108	4039	791	-571	97
TOTAL	**21435**	**22453**	**420**	**22778**	**1115**	**-2133**	**103.60 Say 104**

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. 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. Out of 194.16 thousand hectares of the cultivable area about 122.97 thousand hectares is under irrigation conditions. Out of the total irrigated area canal irrigated is only 1.27 per cent while about 98.73 per cent of the irrigated area is covered by tube well irrigation (CDAP, Mahendergarh, 2009). Ground water depletion is the major problem in the district. The figure 1.4 clearly shows that the problem of water depletion has been reached at alarming stage due to over exploitation of ground water. The average depth of water table was near to 15 meter from surface, it reach up to 45 meter from surface in 2008. Nearly 15 meter decline has been come into the water table in last three decades. The rapid speed of water level depletion causes threat to the sustainability of groundwater resource. The deficiency of rainfall, surface irrigation sources (canals), high dependency on groundwater for irrigation and a very low rate of recharge of water is responsible for scarcity of ground water. The blind extraction of ground water is much more responsible than other factors. After the green revolution, with the development of agriculture, the irrigation sources have been also increased. More than 90 percent of irrigation is doing by tube wells

3. MATERIAL AND METHOD:

The water supply of the district is mainly based on ground water through tube wells. The water supply of the villages is met out through installation of hand pumps and construction of and dug wells by the local villagers. Water for irrigation in the district is also based mainly on ground water. Out of total irrigated area of 1210 sq km an area of 1190 sq km is based on ground water irrigation. Only in 20 sq km irrigation is based on canals. Ground water is being extracted through large no of tube wells and dug wells in the district. The stage of ground water development in the district is 107% .This means that the ground water in the district is under stress and there is very limited scope for ground water development. Two numbers of artificial recharge schemes were implemented in the district in collaboration with the state agencies in order to create awareness in the district. If there is no water, there is no life. Hence water Management is essential. Future generation may be in difficulty due to scarcity of water. The participation of an individual, society and the Govt. is essential for water Management.

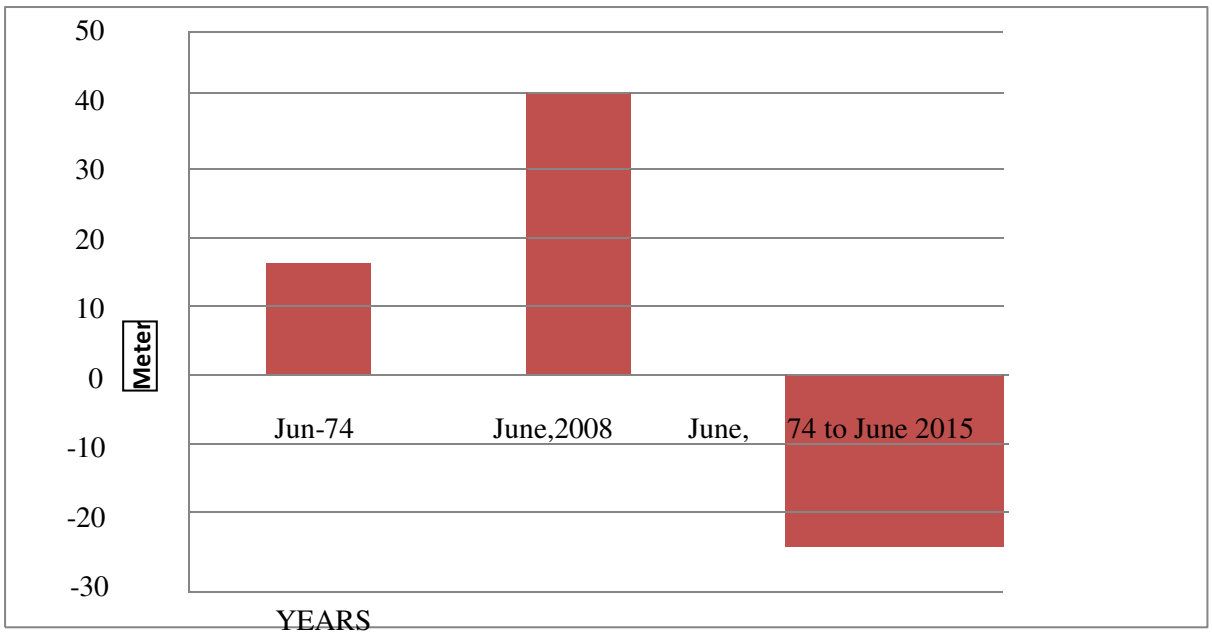


FIGURE1.3 CHANGES IN GROUND WATER LEVEL IN MAHENDERGARH (1974-2015)

4. ANALYSIS:

Rain water percolates into the earth's surface and becomes underground water. The process of percolation also take place from the surface water. Large amount of water gets collected under the Earth's surface. This is called underground water. According to Central Underground Water Boardrenewable underground water capacity in India (1994-95) was about 4310 billioncubic metre per year. Out of this about 3960 billion cubic metre water is available for use. The distribution of undergrounds water is not the same everywhere. Availability of underground water depends upon the amount of rainfall, nature of rainfall, nature of land and its slope. In the areas of high rainfall where the land is almost plain and has porous rocks, the water easily percolates there. Therefore underground water is available in plenty at shallow depths in these areas. In the areas like Nangal Choudhary where the land is plain and has porous sandy soil, the underground water is available in lesser amount at greater depths due to lack of rainfall. With the result underground water is available in less quantity at greater depths in these areas also.

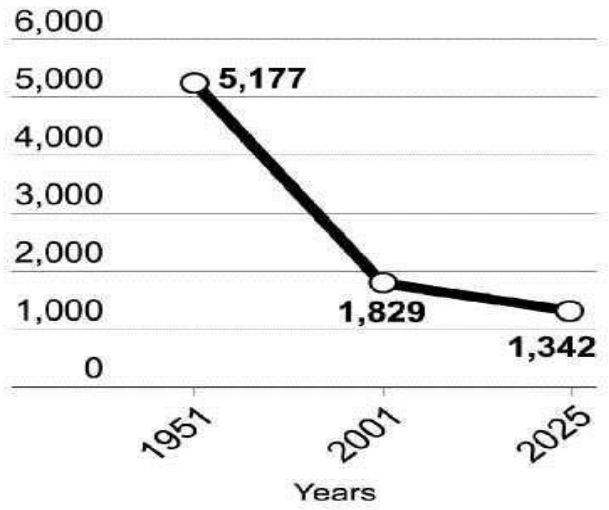


Fig 3 Decreasing availability of water annually

5. CONCULSION:

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:-

- Promote more and more plantation programme in district because plants reduced the soil erosion, uphold the soil moisture and help in raining.
- Government should direct the people for building the rain water harvesting houses
- The crops and vegetation that demand a low amount of water for growing should be in priority.
- There should be adopting those irrigation techniques in which the wastage of water is minimum and area of irrigation maximum such as drip irrigation, close pipeline irrigation etc.

REFERENCES:

1. Panjiar, U.N. (2010), "Efficient Water Management: Challenges and Initiatives" Yojana, Vol. No. 54, pp5-8.
2. Jeet, I. (2010) "Assessment of Ground Water Resources In Haryana-An Environmental Concern" Indian Journal of Environmental Protection, Vol. 30, No.6, pp 493-498.
3. CENTRAL GROUND WATER BOARD Ministry of Water Resources Government of India North Western Region CHANDIGARH.