



Surface and Underground Water Resource Management in Reference to Udaipurwati Block in Rajasthan

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ABSTRACT:- Water is a natural resource, fundamental to life, livelihood, food security and sustainable development. Rajasthan, the largest state in India, faces one of the greatest scarcity of water resources in India. Rajasthan have more than 10.4% of the India's geographical area. It's more than 60% area classified as arid & semi-arid region, this area is a part of the Great Thar Desert. The area west of Aravallies receives low and erratic rainfall. The climate varies from arid to extreme arid in the western half of the State. Rajasthan have 13.99 % cultivable area, 5.67% population, 18% live-stock of India but it have only about 1.20% of the total surface & ground water of India. Population explosion combined with increasing in per capita consumption of water has created tremendous pressure on water resources. There is a huge gap (around 34%) in demand & availability of water. Over exploitation of ground water is the main reason of its rapid depletion. Quality of water (Fluoride, Nitrate, Arsenic and Salinity) is also a big problem in some region. At present more than 219 blocks have been categorized in "Critical and Over Exploited category". The Dark Zone areas are spreading year by year. The ground water levels in major part of the state are depleting at alarming rate.

It is time to revive historical water management practices (khadin, stepwell, kundis, jhalras, johads , talabs etc.) along with new techniques as Rooftop water harvesting, rejuvenation of water bodies through MNREGA, making small dams and anicuts, adopting water saving technologies in irrigation, minimizing wastage, and increasing water use efficiency. Integrated water management approach will be a right approach to manage sustainability of ground water. Local people awareness and participation in water resource management plays a big role along with government policies, programme. Present research paper emphasized on the current situation of ground water availability, various technique of water management and there possible Impact in Udaipurwati Block.

KEY WORDS:-- sustainable development, Over exploitation, water harvesting , dark zone, per capita consumption etc.

Introduction:

Water is a natural resource. It is an essential source for the existence of life on the planet earth. It is used for various purpose such as drinking, animal husbandry, irrigation, industrial and domestic uses. It is indeed most essential for our environment and wildlife. It would not be an exaggeration to say that no life on the earth is possible without water.

Water scarcity is a major issue that is rising very rapidly in Rajasthan. This problem has become so severe in last two or three decades. The groundwater has almost dried up and people have to depend on water supply from other sources. The ground water level has been depleting at alarming rate due to rapid growth in population, increasing per-capita consumption, green revolution and excessive exploitation of ground water. In the past, people understand the value of water and plan their lives around it.

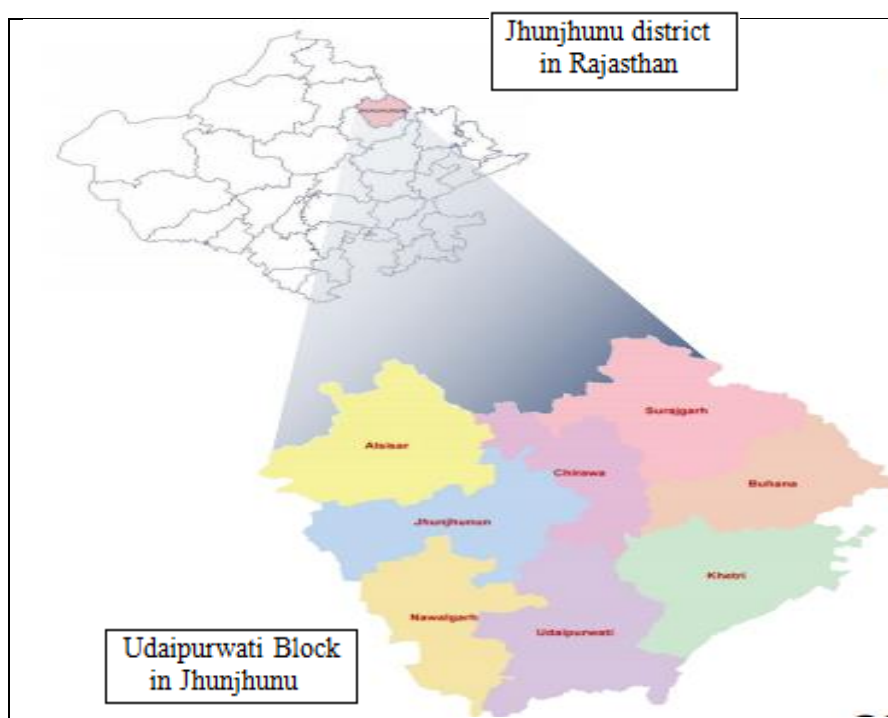


Water scarcity in the state is a consequence of arid climate, low precipitation, low recharge to aquifers and high evapotranspiration. The entire state is principally dependent on groundwater. 91% of the domestic water requirements are being catered from Groundwater Sources (well, tube-well etc.) and remaining 9% is being met from surface water(dam, anikut, ponds, cannel, river etc.). Demand for this limited resource continuously increasing as population grow so its proper management is absolutely necessary to save human life and sustainable development. Continuously monitoring of ground water level plays a big role in its effective estimation and proper management.

Objectives:

1. to highlight present status of ground water in Udaipurwati Block.
2. to know impact of depleting ground water level
3. how we can control or minimize the rate of depleting ground water level.

Study Area:-



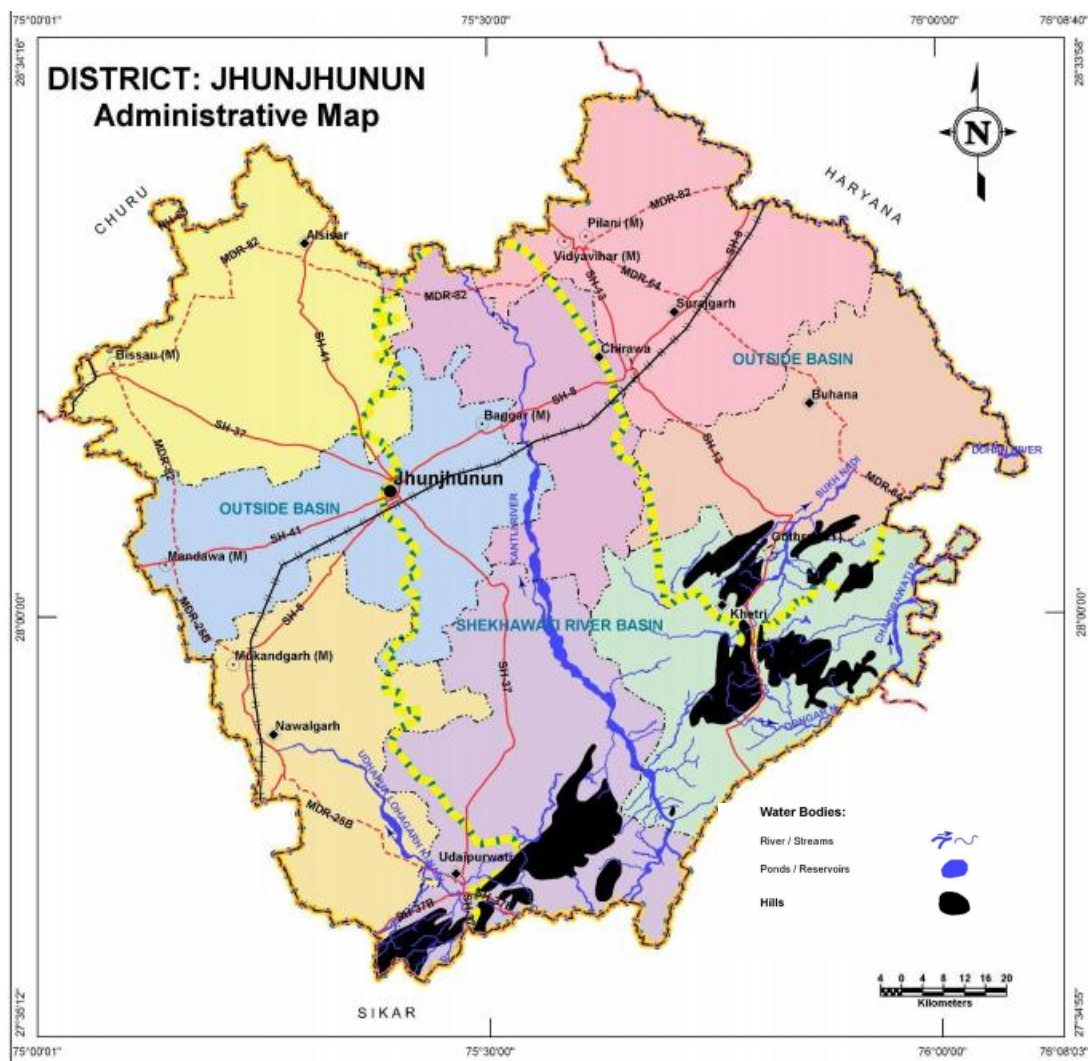
In this research paper the scholar's study area is Udaipurwati block. This block is located in the southern part of Jhunjhunu. The availability of ground water resources is depends on the characteristics of rainfall, soils, climate, physiography, and geo-hydrology of the region. This area is a part of Thar Desert which receives the lowest annual rainfall of the entire country. Jhunjhunu district is administratively divided into eight blocks. Udaipurwati with 881.5 sq. km, the largest block in Jhunjhunu, covers its 15% surface area.

The river Kantli flows in middle of the district from south to north. This is a seasonal and temporary river. Major part of the district does not have a systematic drainage system. This area is a part of internal drainage system of Rajasthan.



The climate of the block is arid type. It have very hot summers and very cold winters with generally poor and erratic rainfall during southwest monsoon period. The potential evapotranspiration rates are high in proportion to precipitation. The annual average rainfall of the block is about 772.3 mm. Rainfall is the major source of ground water recharge in the block. The block receives 90 % rainfall from southwest monsoon from June to September same as state.

The sandy soil found in mostly parts of the block, have the highest infiltration rate to recharge ground water but it also have the lowest water holding capacity among all other soils. Due to this nature of sandy soil, farmers have to water their crops frequently. It creates big challenges to water management .

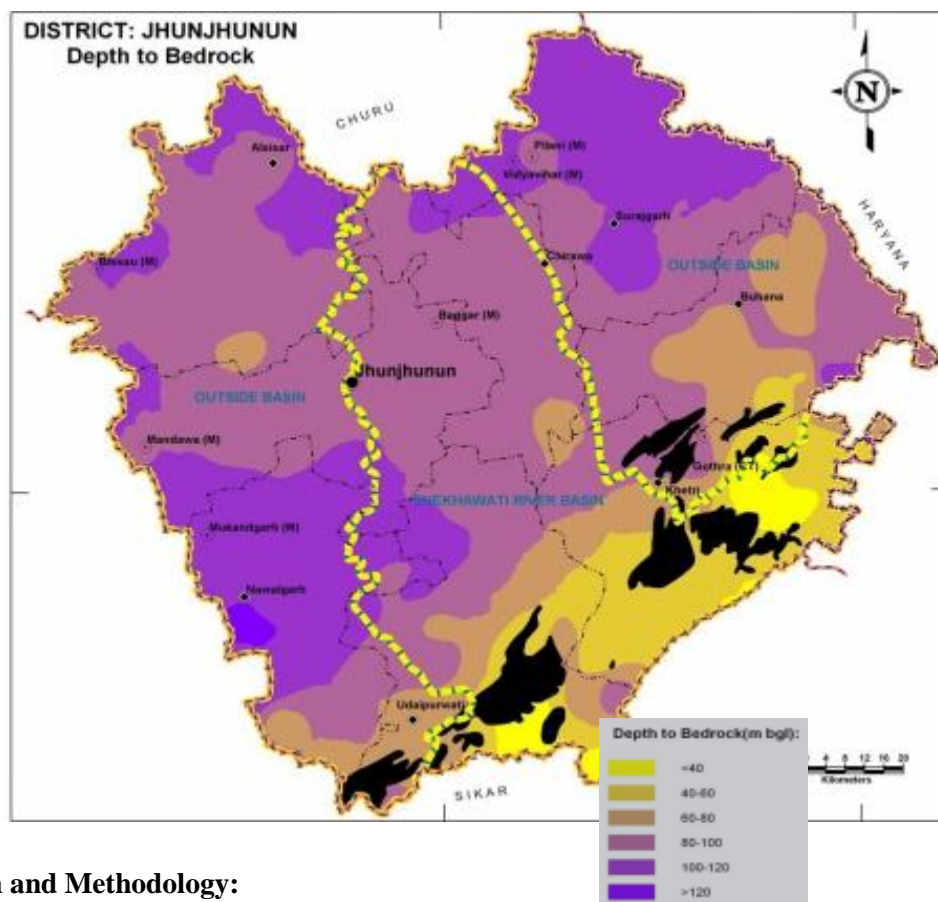


The topography of this block displays hilly area in the southern and south-eastern part which belong to Aravalli range, running in NE-SW direction. Rest of the block has broad undulating plains with sand dunes.



The general slope of the terrain in the block is from southeast to northwest. The area is drained mainly Kantli river and by its streams. Rainfall is always high in the areas closer to hilly areas in the south eastern part of the district.

Ground water level and its sustainable availability also depends on the bedrocks depth. 90% aquifers are found above the bedrocks. The Depth of bedrock is varing 40m bgl in southern to 120m bgl in the western and northern part of the district. Bedrocks in shallow depth are mostly found in southern and eastern part of the district in Khetri and Udaipurwati block. Deepest occurrence of bedrock (indicating high alluvial thickness) is found in eastern part of Nawalgarh block i.e., more than 120m bgl .



Approach and Methodology:

In order to meet the objective of the research paper secondary data sources has been used. The data has been collected from different sources governmental agencies like RSWRD, RSGWD, CGWB, NGOs, State Govt. Reports, GROUND WATER YEAR BOOK 2020-21 RAJASTHAN and Internet sources. Some maps wrap from Hydrological Atlas of Rajasthan and Ground Water Atlas of Rajasthan.

Primary data is collected through visiting at different locations in the block to understand the soil & crop pattern, groundwater use patterns, and to know what practices and technologies are used in agricultural sector for water management. Relevant data has been analyzed to evaluate and find out the current status of water resources of the region and predict some consequences of various anthropogenic activities.

GROUND WATER STATUS :-



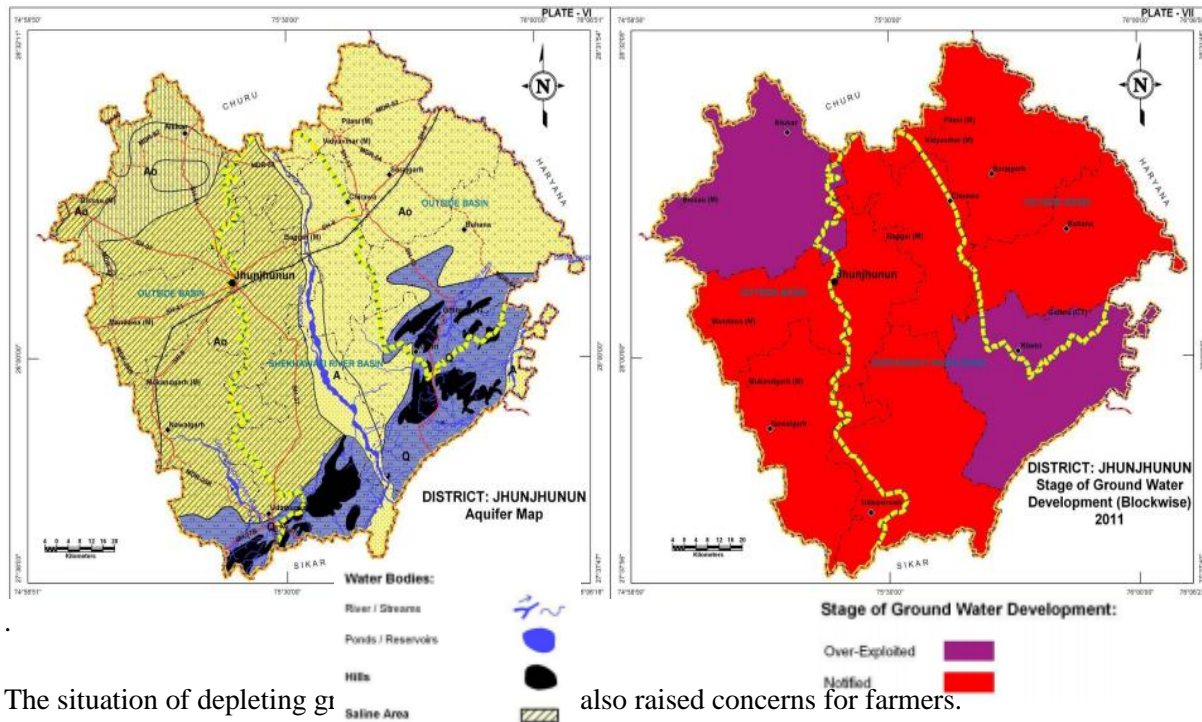
The renewable freshwater resources available from the river basins are extremely limited in Shekhawati region. It is due to getting lowest annual rainfall, having shortest rainy season and highest evapotranspiration in India. In lieu of the limited surface water resources, the dependency has been extremely high on groundwater in the block.

Heavily subsidized electricity on agri- sector, rapidly increasing in demand of irrigation due to green revolution, nature of sandy soil, growing demand in urban areas, population explosion, changing in standard of living, rapid increase in per capita consumption of fresh water are creating tremendous pressure on ground water resources. The latest assessment report of GoR, reveals that in the state the annual extractable groundwater resource is 10.96 billion cubic metre (BCM), while the gross ground water extraction was 16.55 BCM (14.18 BCM for irrigation and 2.37 BCM for domestic and industrial uses). It shows that extraction is more than recharge ,it is about 151% of extractable ground water.

The latest report (March 2022) of GoR. on ground water resource assessment reveals that more than 219 (72% of the total water blocks) blocks in the state have come under the “over-exploited” category. In 14 of the 33 districts, all the blocks are over exploited, which means the water extraction is more than 100% (extraction is more than recharge). The number of over exploited blocks in the state has increased and the number of safe zones has reduced as compared to the previous years.

There are two blocks in Jhunjhunu district have fallen within ‘Over Exploited’ category. This implies that the status of development is already around 100%. The remaining six block of the district are even more stressed as they are in ‘Notified’ category where no further development of ground water is permitted. Thousands of well has completely dried-up in the block. The level of groundwater is constantly depleting in the entire block.

Categorization on the basis of stage of development of ground water	Block Name
Over Exploited	Alsisar, Khetri
Notified	Nawalgarh, Udaipurwati, Jhunjhunun, Chirawa, Surajgarh, Buhana



The situation of depleting gr

also raised concerns for farmers.

Causes and Effects of depleting ground water level:

1. Limited availability of surface water resources that creates tremendous pressure on groundwater resources.
2. Farmers have the tendency to abstract more water from the aquifers to generate more yields .
3. to grow water incentive crops in the era of green revolution
4. lake of awareness
5. due to population exploitation
6. Changes in living standards, increase per capita water consumption.
7. To provide subsidized electricity to agriculture sector, encourage over-pumping and inefficient and often wasteful use of groundwater in irrigation.

Impacts/consequences:-

- The irrigated area under rabi crops is continuously shrinking.
- Farmers dependency is increasing on kharib crops in the block.
- Negative impact on biodiversity
- This area is becoming more drought prone.

From the present study following conclusions have been drawn:

- □ Naturally, the problem of water scarcity in this block and near by areas, is the result of low precipitation, low recharge to aquifers and high evapotranspiration.
 - Humanly, the problem of rapid depletion in groundwater levels, is the result of more extraction than recharge of it.



➤ □ In spite of the little availability, the groundwater resources are the only most dependable source of water for sustenance of life in block and near bye area.

➤ □ The demand of water increasing at a faster rate due to increase in population, green revolution, Industrial growth, urbanization and changing in living standards.

➤ □ Ground water level declines are being witnessed both in hard rock and alluvial areas.

➤ □ Some government restrictions must be laid down on groundwater extraction in over-exploited areas like ban at new agricultural electricity connection, boring new tube-well etc.

➤ □ It is high time to develop Water Saving Technologies (WSTs) specially in irrigation practices because more than 85% (14.18 BCM) of the total extraction (16.55 BCM) of ground water extracted for irrigation purpose only.

➤ □ Awareness and involvement of people in water management practices including conservation, protection, development, and augmentation is the prime requirement for its sustainable availability.

➤ □ The feasible schemes on rainwater harvesting and artificial recharge structures in Over Exploited areas should be mandatory as early as possible.

Suggestions:-

➤ □ Water saving technologies like drip and sprinkler irrigation systems should be promoted in water stressed areas.

➤ □ The excess water in rivers is being wasted, it can be utilized more meaningfully for irrigation projects like IGNP.

➤ □ Roof top rain water harvesting should be mandatory specially in urban areas.

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