

A STUDY ON GROUND WATER MANAGEMENT IN URBAN AREA OF JAIPUR

Dr. Poonam Chaudhary, Asstt. Professor, Dept. of Geography,
Digambar P.G. College, Dibai, Bulandshahr, U.P. India.

Dr. R. K. Gurjar, Associate Professor, Dept. of Geography,
University of Rajasthan, Jaipur, Rajasthan India.

Abstract

Water is the most vital resource for sustenance of life and many developmental activities. But in the past two decades, the modern development and mismanagement of the water resources have resulted in huge water shortages. The Rajasthan state suffers from two problems of water scarcity, one of less rainfall and other high potential of evapotranspiration. The resultant effect is less of natural recharge to ground water. The ground water level in general is showing depleting trend due to over withdraw from the aquifers. There is a long lag between changes in recharge and responses in ground water levels. The increasing demographic pressure on urban agglomerates has developed water scarcity as well as deterioration of surface and ground water. The presented study identified difficulties in this regard and suggested means to augment recharge to ground water resources by artificial means particularly in Jaipur urban area.

Key Words: Water resources, water scarcity, evapotranspiration, ground water, aquifers, Jaipur urban area.

Introduction

Water is the key of life in rural and urban areas. Water supply in urban area is one of the core issues to the civic authorities of the state. In order to cater to the growing demand of water supply for drinking and domestic purpose in the areas where the sources of surface water are less or the ground water based supply is the only dependable alternative. Most of the urban area faces scarcity of water. During last three decades the population of Jaipur urban area has increased many folds. Due to growth of urbanization, economic activities and social needs; the management of water supply has become a challenging task. Increasing population and industries leads to various types of pollution, in which water and solid waste

Pollution is the main cause of scarcity of healthy water.

About the Study Area

The present study focuses on the Jaipur urban area and its dimensions are between the north latitudes $26^{\circ} 47' - 27^{\circ} 02'$ and east longitude $75^{\circ} 36' - 75^{\circ} 55'$ located almost in

the center of the city and covers the area of about 470 sq. Km. The Jaipur agglomerate has parts of

Sanganer (45.5%), Jhotwara (42.5%) and Amer (12%).

Geomorphology of Study Area

Physiographically, the city area is characterized by wide variety of features like sandy planes, hills and intermontane valleys, pediments etc. Major parts of the city covered by the alluvial sandy plains which are dissected at places. In northern and eastern parts the Aravali hill ranges trending north-east, south-west alternating with intermontane valleys constitute significant nature of physiography. There is no major river drainage system in the Jaipur urban area.

Status of Ground Water Availability

Water supply in urban area of Jaipur basically depends on ground water resources. Annual dynamic recharge to ground water is to the tune of 54.5 million cubic meters (mcm) while total annual draft has been estimated as 115.7 mcm thereby over exploitation of about 61.20 mcm of ground water every year. Ground water in the city is mainly found with in quaternary formations. Depth of water level varies from less than 10m to 50m. Due to dryness of surface water resources, the surface water availability is almost negligible. In the urban area of Jaipur 2200 handpumps and 2500 private and 1527 government bore wells are

present. According to report of Ground Water Board, Jaipur, the under ground water level is 400-500 feet which is decreasing 2.5-5 meter every year.

Problems related to Ground Water Recharge

Less rainfall, high potential evaporation and evapotranspiration rate and semi-arid climate of the area affect the ground water recharge and dryness of surface water resources. Increasing demand of drinking water due to population growth, urbanization and industrialization also affect the natural ground water recharge. Water pollution also affects the quality hazards of drinking water in the city, which increases the stress on drinking water supply. Therefore, it is becoming most important to adopt artificial ground water recharging techniques.

Ground Water Management

The role of government in water management practice is very limited; government bodies can act as a facilitator. They can provide technical information, guidance and training for mass awareness. All the citizens should create awareness amongst consumers for economic and judicious use of water for which coordinated efforts are needed.

Keeping in view, the ground water management strategy will have to address element of augmentation of ground water artificially, conservation of precise water assets and natural recharge of ground water in Jaipur agglomerate area. There are some practices and regulations which promote the ground water management effectively:

a. Roof Top Rain Water Harvesting

To overcome the problem of water scarcity, the government of Rajasthan has made a mandatory regulation to construct roof top rain water harvesting structures for new constructed building over 500 m² plot area for houses, government offices, school, college etc. in urban areas. All the authorities of government and private sector have taken up this common recharge structures. These authorities also responsible to restrict to construct roof top rain water harvesting structures in newly constricted colonies. Central ground water Authority, Jaipur is organizing training for artificial recharge techniques and inviting trainees from various sectors.

b. Resource Conservation

To recharge under ground water, conservation of resources is the most significant method by re-uses and recycled the used water. The water from industries and domestic waste water must re-use for other works and activities. Proper checking of water pipelines must be done in housing and official complexes. Promote water conservation techniques for domestic and commercial water usage. Dual water supply; supply of clean drinking water for short duration in a day and supply of recycled water for other activities may be a good practice. Treatment of waste water of urban areas by establishing water treatment plant on some locations like Amanishah Nalla is also a good scheme to conserve the water resources.

c. Resource Protection

We have to protect the fresh water from industrial effluents and from various types of urban solid wastes to conserve the ground water. Governmental and social bodies have to make proper disposal of urban solid waste and establishment of water treatment plant on industrial drainage. To prevent the contamination from solid waste bio-gas production and its implementation is also a good method to protect ground water.

d. Notification of the Urban Areas

As per the directives of the honorable Supreme Court, Government of India has constituted "Central Ground Water Authority" under environment protection act, 1986 to regulate and protect the ground water resources in the country. The entire urban areas needs to be declared "Notified Areas" by the Central ground water Authority for implementation of regulatory measures to protect ground water resources.

e. Registration of Ground Water Abstraction Bodies

Registration of ground water abstraction bodies needs to be made mandatory for entire urban area. After declaration of Notified Area of Jaipur city, Central ground water Authority enforcing regulatory measures in Jhotwara block and Sanganer block is under consideration for water abstraction.

Conclusion & Reccommandation

1. In order to overcome the problem of water there is need to improve rain water

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- management system by storm/roof top rain water harvesting structures.
 2. Reuse of domestic waste water, disposed off from kitchen, may be used in gardening.
 3. Use low capacity flushing systems in toilets.
 4. Check the wastage of water from leakage in pipelines and taps.
 5. All ground water based industries must reuse the water in other operations.
 6. The mass awareness and education to protect and conserve the water resources.

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