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MANAGEMENT OF WATER RESOURCES: A SUSTAINABLE APPROACH TO DELINEATE POTENTIAL GROUNDWATER RECHARGING SITES IN POONCH DISTRICT OF JAMMU AND KASHMIR, INDIA 185211

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ABSTRACT

The demand and requirement for fresh water in Poonch District, J&K India has swiftly increased as the area experiences constant water stress conditions due to drifting rainfall pattern and shortage of surface water resources. Therefore, management of accessible groundwater resources has become critical to fulfil potable water requirements in the area. The present study was conducted to focus on the potential and possible options available for the harvesting of groundwater which in turn would help in revitalizing of dried out water bodies in this far-flung part of the country and enhance the water desires of the people. Therefore in this study, a GPS approach was used to delineate potential artificial recharge sites in Poonch District, J&K India.

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INTRODUCTION

Groundwater has now emerged as a prime water resource due to its near widespread availability, steadiness and low capital cost. it is the most chosen source of water to meet the requirements of various user sectors in India and account for about 30% of the total freshwater. Demand for fresh water resources in the world is perceptibly increasing as a result of rapid industrialization and population growth. Hence, groundwater withdrawal has become an essential part in many of the water management approaches, especially for rural areas. The dearth and inaccessibility to the surface water resources cause inhabitants to exploit groundwater for their domestic, agricultural and industrial uses. Groundwater table depletes when water extraction rates are higher than the rate of replenishment. Hence, an area with excessive groundwater extraction rates experiences a noteworthy volume decline in the groundwater reservoirs. This can cause depletion of water levels in wells, spring, streams and lakes, deterioration of water quality, land subsidence and higher pumping costs. Artificial recharge is a type of controlled recharge where surface water is put on or in the ground for permeation and succeeding movement to the aquifer to enhance the groundwater resources. Artificial recharge is the practice of increasing the amount of water entering to the subsurface reservoirs by artificial means.

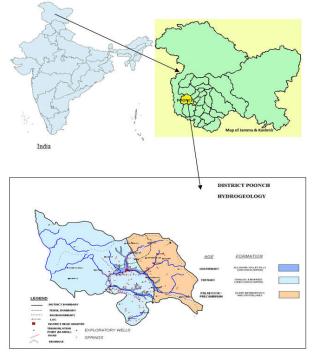
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However, locating the probable sites for artificial recharge is very complicated and depends on many mutually dependent factors including rainfall, drainage density, lineament density, slope, soil permeability, land use/land cover, geology and geomorphology. The influence of different factors on the artificial recharge process is diverse. All these factors play an important role in recharging ground water resources.

Based on the accessibility of surface water resources, Poonch District is one of the region experiencing water stress conditions erratically due to rocky and mountainous nature of the landscapes. Poonch is the border district of Jammu and Kashmir state with a geographical area of 1674 Km² and an average elevation of 981 m above sea level. Temperature of the district ranges from 2.5°C to 31°C as the area experiences hot summers and moderately cold winters. Geographically district consists of various hills and small valleys of meandering and twisting rivulets. Water bodies located in higher reaches of district are mostly seasonal and completely depend on rainfall. The springs and the streams are the only sources of handy fresh water for the masses of the region. As the district has a population of 4.76 lakhs out of which majority inhabits rural and hilly areas. Therefore, the challenge remains to execute the water requirements of people through these springs and the streams. The springs serving the masses inhabiting upper reaches are getting dry. With the lack of regular community water supply in the higher reaches, individuals have left with no alternate but to walk longer distances right through the uneven and coarse landscapes to meet their domestic water requirements. Because of insufficiency of water the farming activities in Poonch area also suffers a lot. Consequently there is a paramount need to follow sustainable approach for the recharging of the springs and harvesting of the water. Therefore there is a need to switch on to the technologies such as rain water harvesting and recharging of dried springs which will help the rural masses to conquer problems associated with the scarcity of water. The paper will focus on the probable and potential options available for the harvesting of groundwater which in turn will help in vitalizing of the dried out water bodies in this isolated and distinct part of the country.

Study Area

Poonch is one of the remote and rural districts of J&K state and is situated at the foothills of Pir Panjal range in the Western Himalayas. It is located between 33°.77' 0" N Latitude and 74.1 '0" E Longitude. The district is divided into 08 tehsils with 178 villages. Topographically, the area is steep, hilly and undulating with a few plain valleys, which is drained by small rivers and nallah like Pulast/Punch river, Surran river, Mendhar river, Mandi river and Bathar river. Poonch district consists of several mountainous peaks such as Tatta kuttian, Dana, Pir ki gali, Sawgiyan, Gali maidan, Bimbar gali, Toota gali, Krishna ghati, Shastar, Balakote etc and small valleys of innumerous meandering rivulet. District Poonch is surrounded by the actual line of control from three sides. The average annual rainfall in the study area was recorded to be 929.2mm. The entire district is traversed by the Siwalik hill range and the Pir Panjal range. The Pir Panjal Range separates Poonch district from the Kashmir valley. District is bordered by Kashmir valley in the north east, District Rajouri in the south and Pakistan occupied Kashmir in the west. The climate of the area is sub-tropical to temperate having three notable season's winter, summer and rainy. The vegetation of the study area is primarily subjected to monsoon rainfall and varies from humid zone to temperate zone. Agriculture system in the area mainly depends on rainfall. There are many springs, small streams and nullahs. Forest land, river, stream, grassland, grazing land, built up land, agriculture land, snow covered area and glacier are the major land use categories identified in the area.



MATERIALS AND METHODS

The entire area of Poonch District was surveyed and investigated with the help of GPS to record the total number of existing water bodies, streams, springs, and nallahs and also the sources on which people depend to accomplish their daily need of water.

Observations

After visiting different parts of the district it has been observed that due to mountainous and rocky landscape of the region water scarcity is evident as majority of population of the area depends upon springs and streams to fulfil their requirement. Whatsoever water bodies that exist in this region are chiefly seasonal thus relving totally on precipitation. Hydrogeologically, the district is divided into two distinct & well defined units i.e. the porous formations constituted by unconsolidated sediments and the hard rock formation constituted mainly by semi-consolidated to consolidated sediments.

In most parts of the area, springs are the foremost ground water structures and have low to moderate yields. Ground water in these mountainous parts of the area come at the surface in the form of springs and is exploited for domestic and other purposes. The majority of the springs of the district and even the bore pumps at most of the places have got dried up due to the lowering of water table. The worse effect this is on the rural women who have to walk to longer distances to meet their daily water needs. In higher reaches up of district the situation is too worse as people have to stand and wait for hours on the roads to fetch water from water tankers supplied by the Indian army and other local bodies. Keeping in view the scarcity of potable water there is a need to follow a sustainable effort by either harvesting rain water or recharging of the dried up springs by adopting diverse measures. Based on the local climatic conditions, topography and hydrogeology of the area, appropriate structures for rain water harvesting can be premeditated. Rain water harvesting techniques need to be adopted in mountainous areas along with the proper scientific involvement for the development, protection and revival of the springs. Now a day groundwater recharging by means of Environmental isotopes technique is also used world over and this option also seems to be good in case of district Poonch due to its diverse topography. Such techniques have been effectively adopted in numerous parts of the world to recharge ground water and are of utmost significance.

In this study an integrated approach using GPS technique was intended for identifying the sites for artificial recharge of ground water in Poonch District of J&K. This study is significant for sustainable use of the groundwater resource thus groundwater recharge by appropriate administration. Application of GPS techniques also facilitate groundwater exploration in lessening down the target areas for conducting in depth hydro geological surveys on the ground. Topographically, being hilly and mountainous runoff is the most common phenomenon observed in the area during the rainy season thereby effecting the recharging of the groundwater. Due to hard and rocky landscape of the area the aquifer are discontinuous and are of diverse geological and hydro geological origin due to which, the ground water situation differs in various parts of the district. Therefore the survey indicated that the most effectual groundwater recharge potential sites are located in Mankote, Surankote and Mandi tehsils of the study area due to the presence of large scale Oak forests along with other vegetation as these forest areas are capable of absorbing rainwater swiftly thereby helping in recharge of ground water resources. Therefore it is suggested to develop possible and diverse measures such as rain water harvesting techniques as a mean of recharging springs and ground water to overcome the water crisis in this rural part of the country.

Recommendations

- In plain areas, in addition to conventional ground water structures like dug wells & springs, shallow to medium depth bore wells can be constructed for developing the ground water resource.
- Conventional water resources like springs need to be revitalized, developed and protected on scientific lines for diverse use
- 3. Small ponds and tanks can be developed for enhancing water resources. The existing structures can be rejuvenated and renovated for harvesting water for use locally for the domestic requirements.
- 4. Rainwater harvesting practices may be adopted in hilly areas since the district receives plenty of rainfall. Because of hilly terrain, maximum runoff takes place, and a very minute quantity adds towards ground water recharge
- Mining of the riverbeds should be prohibited as it leads to fall in the water levels and it also damages the natural river system.
- 6. General masses should be made aware for the proper utilization, conservation and protection of available water resources.

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References

- Basavaraj, H., Nijagunappa, R., (2011), Identification of groundwater potential zone using geoinformatics in Ghataprabha basin, North Karnataka, India. *International Journal of Geomatics and Geosciences* 2:91-109.
- Bhattacharya, A.K., (2010), Artificial ground water recharge with a special reference to India. *International Journal of Research and Reviews in Applied Sciences* 4 (2): 214-221
- Bhat, M., (2016), Ground Water Recharging: A sustainable Approach for water resources Management in Rural areas. *Journal of Basic and applied Engineering Research* 3(2):180-181.
- Bouwer, H., (2002), Artificial recharge of groundwater: hydro-geology and engineering. *Hydrogeology Journal* 10 (1): 121-142.
- Central Ground Water Board (2002), Master Plan for Artificial Recharge to Groundwater in India. New Delhi
- Central Ground Water Board-India, (2007), Manual on Artificial Recharge of Groundwater. Ministry of Water Resource Board, Government of India.
- Gupta M, Srivastava PK. (2010), Integrating GIS and remote sensing for identification of groundwater potential zones in the hilly terrain of Pavagarh, Gujarat, India. Water Int 35:233-45.

Jkenvis.nic.in/bhuvan/lulc/poonch.pdf

- Machiwal D, Jha MK, Mal BC.(2011), Assessment of groundwater potential in a semiarid region of India using remote sensing, GIS and MCDM techniques. Water Resour Manag; 25:1359e86.
- Manual on artificial recharge of ground water (1994), Technical series-M, No.3, Central ground water Board, Faridabad March 1994:215
- Ofterdinger, U.S. Balderer, W., Loew, S. and Renard, P. (2004), Environmental isotopes as indicators for ground water recharge to fractured granite. Groundwater. Nov. Dec. 42(6 7): 868- 79.

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