Comprehensive Study of Groundwater Contamination and Its Depletion - A Case Study

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Abstract- *Groundwater has been decreasing because there is lack of awareness against recharge, reuse and recycle. Raising ground water level by artificial recharge method. There are total 94tube wells inside Daskroi taluka which have helped to eliminate irrigation and drinking problems. Apart from this the main source for recharging is Fatehwadi canal and Narmada River. The aim of the research project was analysed the groundwater data to visualize how much water is the actual scenario for the groundwater and surface water against domestic, industrial and irrigation use. Considering the employment of water within the returning years, water recharge ought to be planned from currently on. Improve and enlarge the standard of the geological formation.*

Keywords- Artificial Recharge, Groundwater, Recharge Well, Statometer

I. INTRODUCTION

The ground water is augmented at higher rate than those under the natural condition of percolation which is the process of artificial recharge. Artificial recharge is comparatively betterand effective than natural recharge.By modifying the natural movement of surface water utilizing suitable civil construction techniques an increment of ground water reservoir which is the aim of artificial recharge to ground water. For get better the quality of groundwater artificial recharge method should be used.

People are depending on surface water but due to insufficient rainfall we depend on ground water for various uses. So ground water level can be increased with the help of artificial recharge. The use of artificial recharge is usually when ground water quality is poor. Artificial recharge is employed to revive the water of the wells, lake, etc. since it's dried for anextended time. Ahmedabad have Sabarmati river so, alluvial aquifers in Gujarat. But unwariness of exploration for irrigation and industrial development as a result of unwanted outcomes.

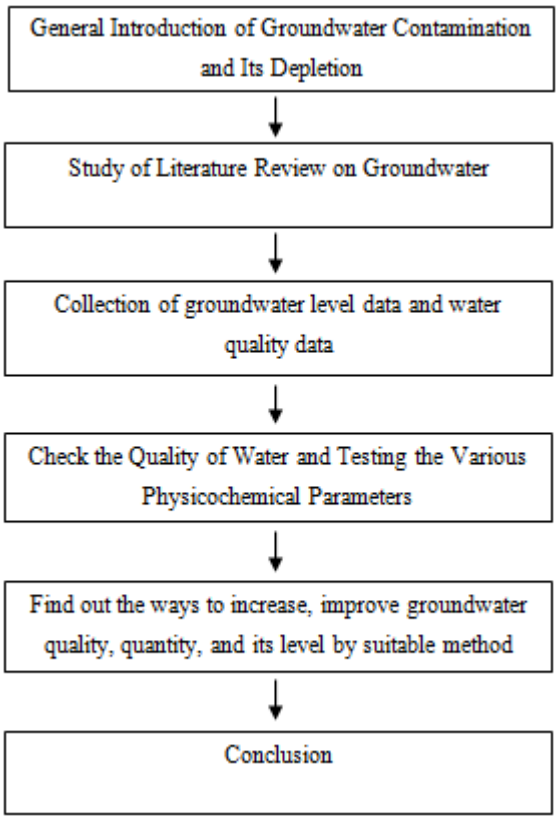
In Ahmedabad district have average700-800 mm rainfall per year and level of groundwater decrease day by day due to uneven rainfall pattern in Ahmedabad. In municipal get one- time water rather than two time a day in different areas.Also in rural areas, water levels have to be piped downward into bore wells or tube wells. So it necessary to groundwater recharge artificially or naturally.

II. OBJECTIVES OF THE STUDY

The aim of the research project is to understand what causes groundwater to diminish and become polluted.

To the increasing level of groundwater by the help of recharge well method.

III. METHODOLOGY



IV. LITRATURE REVIEW

In the year 2016, Debu Mukherjeehave studied on, 'A Review on Artificial Groundwater Recharge in India.'For the increasing the level of groundwater they have used proper planning schemes for artificial recharge. They also used specific methods for artificial recharge. Direct and Indirect method. In addition they have discovered different advantages and disadvantages of the recharge techniques. They suggest for future to discovered different artificial recharge techniques for various condition, which is economic and easy for study.

In the year 2017, Matevz Vremec, Miha Kracunhave studied on, 'A Groundwater Artificial Recharge Management Tool: Case Study of the Drava River in Maribor.' This study on thefree and open source software tools for Water resource management through case study of the river has been completed. For achieving their objectivesthey use the QGIS/FREEWAT tool for building a groundwater model and to present the efficiency of the existing artificial groundwater recharge.

In the year 2017, DR. Ibtisam R Karim, Ali Mahdi Abd Alihave studied on, 'Case Study of Artificial Recharge of Groundwater by Injection Wells.' In this study there are replenish the groundwater with the help of Injection well method.Groundwater modelling system through simulating the flow system of a confined aquifer have applied for study in a particular area. They have considered two method. In the first part the data have collected from General administration of groundwater which includes climatic data. In the second part groundwater study have completed through software.

V. STUDY AREA PROFILE

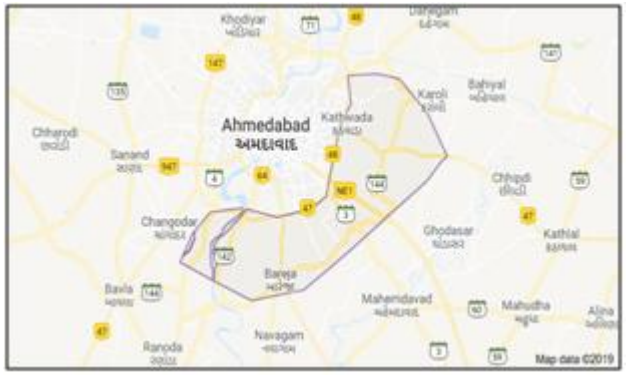


Figure: 1 Location of Daskroi

The study area was located at Daskroi, Ahmadabad which is 23.033, and 72.460 latitude and longitudinal. Total area of Daskroi is 501.23 sq.km. There are total 54 villages in Daskroi Taluka.

There are 58.4% urban area and 41.965% rural area present. Farmers are used the Fatewadi canal water for irrigation, cultivating of different crops. Using bore well through drinking facility has been completed.

VI. RECHARGE WELL TECHNIQUE

Flooding, Basins, or percolation tank, stream Augmentation, Ditch & Furrow System, Recharge Well, Recharge Pit/ Shaft, Dug Well, Induced Recharge, these are the various methods of the artificial recharge method.

A well that accept the water from the surface to freshwater geological formation which is called a recharge well. Recharge wells are also referred to as drain wells. They ought to be distinguished from injection wells, which recharge brines and toxic industries wastes to deep, saline water aquifers.

The purpose behind recharge wells is that the water used in farming, industry, and daily functioning. That water can be stored in required depth in the geological formation for the future by recharge well.Due to lack of awareness and resources of recharge in rural and urban areas, groundwater cannot be done recharge.

A recharge well's flow is that the reverse of pumping well but its construction may or might not be an equivalent. Recharging is practical where deep, confined aquifers must be recharged, or where the economy of space, like in urban areas, is a determining consideration.

Recharge water directly to the geological formation in recharge wells. It is almost like pimping wells. It is costlier than the methods of recharging techniques. Occasionally abandoned tube well are often used for recharging water into the geological formation. Also, for recharging single and multiple wells this method is more suitable.

Recharge water may carry large amounts of dissolved air, treading to reduce the permeability of the aquifer by air binding. Recharge water may also contain bacteria, which can from growths on the well screen and the surrounding formation, thereby reducing the effective flow area.

Chemical constitutes of the recharge water may differ sufficiently from the normal groundwater to cause undesired chemical reactions. Favourable recharge rates have been maintained by chlorination and periodical pumping of wells.

VII. REMEDATION PROCESS

Groundwater is contaminated in two ways: One naturally and the other artificially. Naturally the water that gets polluted. Due to this, TDS is more frequent. Due to industrial development and pesticides used in agriculture, water is polluted. As a result, more than one type of impurities is dissolved in the water. Many types of diseases arise due to this type of water consumption.

The remediation process is done to check and remove impurities from water. In this process, it is taken a sample of ground water from specific area. Subsequently, a treatment plant is made to remove any impurities that may be found in excess. The impurities are removed by it and then water is released into the ground.

This process is expansive and slow, but it is known by how much levels of impurity in the ground water. The water level can be maintained by purifying it. So for future use that water can be saved.

VIII. STATOMETER

Monitoring of groundwater consumption and recharge is very necessary. It is also necessary to know what is the level of the groundwater aquifer used before and after the monsoon. For this a machine called statometer can be placed on the bore well.

The device is fitted with a solar panel. Using this device shows four readings of the groundwater level in a day which is displayed on the dashboard. Thus the actual situation of the groundwater after pre monsoon, and post monsoon can be ascertained. Thus, this device is very important for groundwater monitoring.

The Statometer is a Digital Water Level Recorder which can be used in tube well for measurement of water level data. Non-contact devices in water level measurement are the in the groundwater sector. Statometer uses sound waves for accurate measurements.

IX. CONCLUSION

As the groundwater goes down, the water quality deteriorates. Thus, if the ground water is recharged, the quantity and quality of water will be maintained. Also, it will be kept for future use and its quality will improve.

Selecting a specific area, the amount of water used in agriculture, the daily consumption and the industrial area, should be recharged well considering the number of the available water sources in that area.

Considering the irregular pattern of rainfall and unforeseen changes in the atmosphere, day by day rainfall is reduced. Therefore a recharge well should be made in a village. As a result, water impurities can be reduced. And the amount of water can be increased in aquifers.

Other than recharge well, such as percolation tank, Recharge Pit/ Shaft, Dug Well, Induced Recharge method can also be used to increase the level of recharge and groundwater.

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