International Advance Journal of Engineering, Science and Management (IAJESM)
ISSN -2393-8048, January-June 2014, Submitted in June 2014, iajesm2014@gmail.com

Role of Ground Water Recharge in Sustaining Water Resources with Reclaimed Waste Water of Canal

Dr. Dharminder pal singh, Department of Botany, Ch. Balluram Godara College, Sri Ganganagar (Rajasthan).

ABSTRACT

Groundwater recharge is the process by which water from the surface of the Earth, such as from rain or snow, infiltrates the soil and replenishes groundwater aquifers. Groundwater is an important source of drinking water, irrigation water, and industrial water for many parts of the world. Groundwater is a vital source of water for drinking, irrigation, and industrial use. It is estimated that groundwater provides about 40% of the world's drinking water and 20% of its irrigation water. In some countries, groundwater provides even more of the water supply. For example, in India, groundwater provides about 80% of the water for irrigation and 50% of the water for drinking.

Groundwater is replenished through a process called recharge. Recharge occurs when water from the surface, such as rain or snowmelt, infiltrates the soil and enters the groundwater system. The rate of recharge depends on a number of factors, including the amount of precipitation, the type of soil, and the slope of the land. Groundwater recharge is important for sustaining water resources because it helps to offset the amount of water that is withdrawn from the system. When the rate of withdrawal exceeds the rate of recharge, groundwater levels can decline. This can lead to water shortages, water quality problems, and the need for more expensive water supply options.

KEYWORDS: Sustainable, Water, Resources, Management, Artificial.

INTRODUCTION

Groundwater recharge is an important process that can help to maintain the quantity and quality of groundwater resources. By understanding the factors that affect groundwater recharge and the challenges associated with groundwater recharge, we can develop strategies to protect and conserve this valuable resource.

Sustainable water resource management advances the entire development deals with any consequences as to whether the water needs of more people can be met consistently and adequately in the future. Artificial recharge of groundwater wells is indeed becoming fundamental to maintain the reliability of water supply where conjunctive use of surface water and groundwater resources is considered. Between the few wells of open water for groundwater recharge – which integrate direct rainfall, flood or other inundation water, imported water and reused water – treated unimaginatively as source water for groundwater, Increasing consideration has been given to the use of reclaimed specific wastewater recharge.

Water reuse unites the evaluation of water supply and general prosperity, requiring planning and sorting of sites, wastewater treatment plant siting, and more to reduce the quality of the treatment process. Likewise financial and monetary assessment and water utility management are fundamental, including some reasonable compromise of water resources and reused water. However successful the drivers behind water reuse may be isolated to each circumstance, the overall goal is to close the hydrological cycle on a fundamentally more legal, neighborhood-scale scale. Along these lines, respectable wastewater, after guaranteed treatment, turns into a basic water resource "at the door of the sector" according to a realistic perspective, which is difficult to make.

A fundamental forward movement in the advancement of rationality for water resources was achieved when water reuse was accepted as a decision that satisfied water interests. Water recovery and reuse is relatively the most difficult decision to make, both physically and economically, taking into account the fact that water sources (i.e., general wastewater) are routinely of the worst quality. Thus, apparent level treatment is typically used, a substantial portion of the net requirements starting with previous water use, to work through any enrichment concerns and decisions to reuse the water.

There are a number of things that can be done to increase groundwater recharge. These include:

- Reducing impervious surfaces. Impervious surfaces, such as roads and parking lots, prevent water from infiltrating the soil. By reducing the amount of impervious surfaces, we can increase the amount of water that is available for recharge.
- Incorporating water conservation measures. Water conservation measures, such as fixing leaky faucets and watering lawns less often, can help to reduce the amount of water that is withdrawn from the system. This can help to prevent groundwater levels from declining.
- Recharging groundwater artificially. In some cases, it may be necessary to recharge groundwater artificially. This can be done by using a variety of methods, such as spreading water on the ground, injecting water into the ground, or creating artificial wetlands.

Groundwater recharge is an important part of water resource management. By taking steps to increase groundwater recharge, we can help to ensure that there is enough water available to meet the needs of our communities.

ROLE OF GROUND WATER RECHARGE IN SUSTAINING WATER RESOURCES WITH RECLAIMED WASTE WATER OF CANAL

The requirements for reused water (eg, large-scale treatment and another conveyance structure) make water reuse wasteful, thereby restricting its more obvious use. Through the sorting of water resources, in any case, the use of reused water to meet the transient requirements of the water supply relationship, as well as the large length water supply stable quality without the progress of dams and storage places.

Whether water reuse is justified depends on careful considerations of cash flow, the actual purposes of the reused water, the imperative of waste transport, and public attitudes, where there is an urge to conserve rather than strengthen available water resources. Financial, can enrich and deprive. Similarly, the changed interests of various partners should be considered while remembering the eye saviors for the environment.

Water recovery and reuse screen freshwater supplies. This promotes the water supply available to the firm, and exceptional water supplies, for example for drinking water, can be checked by subtracting reused water, where legal.

This is normally enabled. It can save the strength of waterways, wetlands, greenery, and reduce the level of overfishing and various toxic substances entering the waterways and the sensitive marine conditions by reducing the aimless activities.

This can save resources. Reused water starting from the treated effluent contains supplements. If this water is used to flood ordinary land, less manure is averaged for crop progress. By reducing currents that increase (and bring about pollution) waterways, development business and fishing ventures are also helped.

Artificial recharge to groundwater using proposed wastewater is on the rise, especially in arid and semi-arid countries. Artificial recharge as a process to manage the traditional supply of groundwater aquifers is ending up in groundwater management on a fairly large scale.

Artificial recharge structures are a method of restoring groundwater by surface and sub-surface processes. It is terrible in a general sense that groundwater must be recharged regularly or artificially in relation to the amount of depletion. As artificial recharge has been permanently tackled, managers have begun exploring additional wells for recharged water. In this particular situation, recharging groundwater using the treated area aimlessly is a possible solution that reduces the interest for freshwater and improves wastewater reuse. The different formations that have been used, starting with one side of the planet then the next side can be quickly organized under two classes as surface method and sub-surface processes.

In a subsurface process, surface runoff water is siphoned directly from the subsurface through shafts or wells by specific current or by using mechanical pumps. Stream surveys depend on the subsurface structure for recharge shaft technology as it for all intents and purposes consumes less space and there is basically no occurrence of water in the form of soil submersion and diffusion, which can reliably then Occurs when source water needs to cross the vadose zone. The recharge speed is also fundamental as it is clearly visible on the vulnerable layers. Recharge shafts can be made in two undeniable ways. vertical and level. The vertical recharge shaft can be designed to pay a little respect to the bottom of the shaft to mix properly.

The over-extraction of groundwater results in a rapid extraction of seawater, which is predicted to be at risk of groundwater seepage. Rainwater harvesting has been mandated by the Tamil Nadu State Leading Group to re-establish sub-surface spring, which has given reasonable results on groundwater recharge6. Therefore, there is a need to judiciously evaluate the work of rainwater harvesting and groundwater recharge to deal with groundwater scarcity. This development is equally rain dependent which is suspect in nature apart from being open for a brief period. Sustainable water supply demands groundwater spring recharge in all conditions and gives little notice to the seasons.

In fact, major changes have been observed in the nature and portrayal of metropolitan reform in India. Our metropolitan conglomerates are in the midst of an evolving space, n both in terms of usage and planning that achieve the demand for high-rise structures and the thickness of people expanded in restricted space. As interest in water increased, so did the need for imported water from outlying countries. There are water-related impact issues and conflicts between metropolitan and peri-metropolitan areas. Clearly persuading management needs to sustain itself with resource-expanding measures.

The slow recovery of ground water reserves cannot keep up with the past insanity continuing through mis-utilisation of ground water resources in various parts of the country. To replace the standard aquifer of groundwater, artificial recharge to groundwater has emerged as an imperative and forward-looking management approach. As a result, groundwater is recharged using various accelerated and traffic cycle recharge inducers. The social phenomenon of this improvement depends on the hydrology, geology and differ rent parts of an area. Thereafter, artificial recharge of the spring is probably the most ideal decision to rectify the groundwater crisis, which is ultimately sustainable.

In addition to the above, here are some other benefits of groundwater recharge:

- Improves water quality. Groundwater is often cleaner than surface water, because it is protected from pollution by the soil. Recharging groundwater can help to improve the quality of surface water by reducing the amount of pollution that reaches it.
- Reduces flooding. Groundwater can help to reduce flooding by storing water during periods of heavy rain or snowmelt. When groundwater levels are high, this water can be released slowly into streams and rivers, helping to prevent flooding.
- Supports ecosystems. Groundwater is essential for the survival of many ecosystems, including wetlands, forests, and grasslands. Recharging groundwater can help to support these ecosystems and the wildlife that depends on them.

Overall, groundwater recharge is an important tool for water resource management. By taking steps to increase groundwater recharge, we can help to ensure that there is enough water available to meet the needs of our communities, improve water quality, reduce flooding, and support ecosystems.

There are a number of factors that can affect groundwater recharge rates, including:

- Climate: Rainfall and snowmelt are the primary sources of water for groundwater recharge. In areas with high rainfall or snowfall, groundwater recharge rates are typically high.
- Soil type: The type of soil can also affect groundwater recharge rates. Soils with high infiltration rates, such as sandy soils, allow water to quickly infiltrate the soil and reach the groundwater table. Soils with low infiltration rates, such as clay soils, can slow down the infiltration of water and reduce groundwater recharge rates.

- Vegetation: Vegetation can also affect groundwater recharge rates. Plants help to intercept rainfall and snowmelt, which can slow down the water's journey to the surface and allow more time for it to infiltrate the soil.
- Land use: Land use can also affect groundwater recharge rates. Urban areas with impervious surfaces, such as roads and parking lots, can reduce groundwater recharge rates by preventing water from infiltrating the soil.

Groundwater recharge is important for maintaining the quantity and quality of groundwater resources. By understanding the factors that affect groundwater recharge, we can develop strategies to protect and conserve this valuable resource.

Methods of Groundwater Recharge

There are a number of methods that can be used to increase groundwater recharge rates. Some of the most common methods include:

- Rainwater harvesting: Rainwater harvesting is the collection of rainwater for later use. Rainwater can be collected from roofs, gutters, and other surfaces and stored in tanks or cisterns. Rainwater harvesting can be a cost-effective way to increase groundwater recharge rates, especially in areas with high rainfall or snowfall.
- Conservation tillage: Conservation tillage is a type of farming practice that reduces soil disturbance. Conservation tillage practices, such as no-till and reduced-till, can help to increase infiltration rates and improve groundwater recharge rates.
- Reforestation: Reforestation is the planting of trees in areas that have been deforested. Trees help to intercept rainfall and snowmelt, which can slow down the water's journey to the surface and allow more time for it to infiltrate the soil. Reforestation can be an effective way to increase groundwater recharge rates in areas that have been deforested.
- Artificial recharge: Artificial recharge is the process of artificially injecting water into the ground to replenish groundwater aquifers. Artificial recharge can be done through a variety of methods, including:
  - Injection wells: Injection wells are drilled into the ground and water is pumped into the well.
  - Spreading basins: Spreading basins are large, shallow basins that are used to spread water over the ground.
  - Drip irrigation: Drip irrigation is a method of irrigation that delivers water directly to the roots of plants. Drip irrigation can be used to apply water slowly and evenly, which can help to reduce runoff and increase infiltration rates.

Benefits of Groundwater Recharge

Groundwater recharge has a number of benefits, including:

- Increased water supply: Groundwater recharge can help to increase the amount of water available for drinking, irrigation, and industrial use.
- Improved water quality: Groundwater recharge can help to improve the quality of groundwater by filtering out pollutants and contaminants.
- Reduced flooding: Groundwater recharge can help to reduce flooding by storing water in the ground and preventing it from running off the surface.
- Increased biodiversity: Groundwater recharge can help to increase biodiversity by providing water for plants and animals.

Challenges of Groundwater Recharge

There are a number of challenges associated with groundwater recharge, including:

- Cost: Groundwater recharge can be a costly endeavor, especially if it requires the construction of new infrastructure, such as injection wells or spreading basins.
- Water quality: Groundwater recharge can be negatively impacted by the presence of pollutants and contaminants in the water.
- Public acceptance: Groundwater recharge can be controversial, as some people are concerned about the potential environmental impacts of injecting water into the ground.

ISSN -2393-8048, January-June 2014, Submitted in June 2014, iajesm2014@gmail.com

CONCLUSION

The recharge bed with the mix of the recharge lake and the recharge shaft up to the confined spring were viewed as solid areas as the review location. This development is best closed considering the area and hydrographic properties. In such super area projects, thickness in people/unit land area is high and the interest drawn for fresh water is correspondingly high. In any case the presented shrewdness and assessment, the strategy of using only artificial recharge from rainfall is considered to be fundamentally unsuitable.

It is imperative to use reuse strategies for treated enriched water to properly recharge the spring and thereby reduce freshwater interest in water scarce areas especially for non-flowing countries. Furthermore, the presented study can continue to consider rising water with sending as a combination management for further degree of study. Using innovative decisions to implement new groundwater recharge projects requires an approach and curriculum, and will help form the narrative on which to settle and coordinate future and current groundwater efforts.

REFERENCES

- Allam, A.R.(2011). Artificial ground water recharge in Egypt ,Ph.d. thesis irrigation and hydraulic department ,faculty of engineering, Cairo University Egypt.
- Asano, T. (2013). Artificial recharge of ground water boston: Butterworth publishers.
- Birks, R. And Hills S.(2012), characterization of indicator organism and pathogensin domestic gre water for recycling, environmental monitoring and assessment,129(1-3),61-69.
- Bouwer H. And R.C. Rice (2011). Effect of water depth in ground water recharge basin on infiltration rate. Journal of irrigation and drainage engineering 115:556-568
- Oaksford, E.T.(2013). Artificial recharges method, hydraulic and monitoring,in artificial recharge of ground water, T. Asamo, editor. Butterworth publishers, Boston,pp.69-127.
- Piet, G.J. and B.C.J. Zoeteman (2013),organic water quality change during sand bank and dune filtration of surface water in the nether lands. Journal AWWA, 72(7) 400-414.
- Pyne, R.D.G.(2012). Ground water recharge and well. A guide to aquifer storage recovery. Lewis publishers, Boca Raton ,Florida, p.376
- Toze S.(2010).pathogen survial in ground water.a review of the literature. In water quality improvement during aquifer storage and recovery.volume 1:water quality improvement process, P.Dillon and S.Toze (eds),AWWA research foundation report 91056F,PP.123140.