Restoration of Water Energy

(A case study at Army Institute of Management, Kolkata)

Dr.Sweta Rani,
Asst. Professor,Army Institute of Management, Kolkata.

Dr. Purnima Kumari,
Asst. Prof.,M.J.M. Mahila College, Katihar, Bihar.

INTRODUCTION

Groundwater recharge is a hydrological where water moves downward from surface water to groundwater. Recharge is the primary method through which water enters an aquifer. This process usually occurs in the vadose zone below plant roots and, is often expressed as a flux to the water table surface. Groundwater recharge also encompasses water moving away from the water table farther into the saturated zone. Recharge occurs both naturally and through anthropogenic process where rainwater and or reclaimed water is routed to the subsurface. Groundwater is recharged naturally by rain and snow melt and to a smaller extent by surface water . Recharge may be impeded somewhat by human activities including paving, development, or logging. These activities can result in loss of topsoil resulting in reduced water infiltration, enhanced surface runoff and reduction in recharge. Use of ground waters, especially for irrigation may also lower the water tables. Groundwater recharge is an important process for sustainable groundwater management, since the volume-rate abstracted from an aquifer in the long term should be less than or equal to the volume-rate that is recharged.

RESEARCH GAP IDENTIFIED

The AIMK like every other University has over the years undergone some serious and effective changes which have led to the welfare and benefit of the students as well as the faculties. The university had a certain set of challenges and demands to meet and over the years it has done well to overcome those challenges.The inefficiency of the groundwater management led to floods and other problems that needed fixing. Over time, these challenges have been met and thought of.

OBJECTIVE OF THE STUDY

A vision to shape the innovative solutions and to address the challenges of sustainable development in terms of water energy concept among the students and local residents. The objective is to penetrate knowledge pertains to water energy and its future implications on social, economic and environment aspects of business, society and public policy.

RESEARCH FRAMEWORK

Ever since the college was established, it has always aimed towards improvement for betterment. It adopts all sorts of innovative technologies and ideas towards sustainable development. The main aim of AIMK has always been ‘ INVESTING’ rather than ‘ SPENDING. The university has also been a witness to the change in the management of the groundwater system. The problem of water clogging did cause a major headache at one point of time. Now, with efficient technologies the problem of water clogging has found its way out of the university. Earlier, almost everything, from keeping records and data to carrying out certain jobs, was manual. Now, with time and with the advent of technology, the problem of time management has been subsequently reduced. Simple solutions for simple problems have proved to be very effective. A living lab organized and conducted awareness sessions about the implications and importance of ground water recharge concepts followed by practical demonstration of their idea along with their expected budget.

Rationale: & Synergy for curriculum development:
Local markets are transforming to Sustainable Consumption & Production.
Tambon-level Operations & Suppy Chain is transforming to Disaster resilient Infrastructure & Resource Block-chain. Bottom-up Finance is transforming to Carbon Proof Financing. Furthermore, Human Resources is transforming to Re-skilling & Capacity Building for enhanced implement ability of Sustainable Development Goals.

1.Need for paradigm shift: Capacity building and Curriculum Development:
The "Living Lab" format dwells on (i) Responsible Management,
(ii) Research Methodology with Geo-spatial Statistics tool,
(iii) Corporate Social Trusteeship
(iv) Ethics.

2. Relevance:
Curriculum development embeds the following tranformations:
a) Operations & Suppy Chain is transforming to Disaster resilient Infrastructure & Resource Block-chain
b) Human Resources is transforming to Re-skilling & Capacity Building for enhanced implement ability of Sustainable Development Goals.

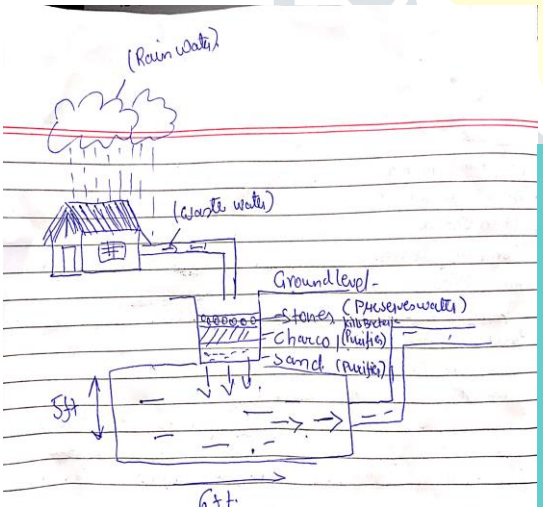
3. Teaching format: "The Living Lab"
Multi-habitat experience enhances my learning on Water - Waste - Energy

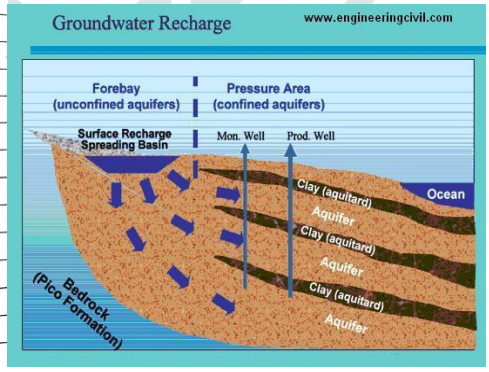
RESULTS

- **Groundwater recharge** or **deep drainage** or **deep percolation** is a hydrologic process**,** where water moves downward from surface water to ground water.
- Recharge is the primary method through which water enters an aquifer. Groundwater recharge also encompasses water moving away from the water table farther into the saturated zone.

- Recharge occurs both naturally (through the water cycle) and through anthropogenic processes (i.e., "artificial groundwater recharge"), where rainwater and or reclaimed water is routed to the subsurface.
- It is the process by which the ground water is improved at a rate much higher than those under natural condition of percolation.
- The main importance of this system in controlling effects of climate change and maintaining declining ground water levels.

Identification of area for ground water recharge





Rain water harvesting is the collection of rainwater into the man made resources or any natural resource like pond, lake, etc at the same place where it falls from rooftops or ground. Two main techniques of rainwater harvesting are storage for future use and recharge into the ground. It can be used for crop harvesting, gardening, toilets, etc. Following are the benefits of rainwater harvesting at individual or city-wide level. It helps in reducing the water supply bills especially to the institutions. Rainwater recharged to the ground positively affects groundwater quality by diluting fluorides, nitrates and its salinity. It contains almost neutral pH and zero hardness which makes it more able to be used in homes, industries, institutions and other commercial establishments. It may reduce the stress of public water supply sources. Recharge of rainwater to the ground prevents sea-water immersion into the fresh water bodies in the coastal areas.

It helps in controlling urban flooding if people do rainwater harvesting from rooftops. It reduces water demands of people from the municipality thus lessens energy consumption too in distributing water all through the city.

RECOMMENDATION & CONCLUSION

Rain water harvesting is a technique used for collecting and storing rainwater by using various means in different resources for the future use purpose (like cultivation, etc). Rain water can be collected into the natural reservoirs or artificial tanks. Another method of collection is infiltration of surface water into the subsurface aquifers before getting lost by surface overflow. Rooftop harvesting is also a method to collect rainwater. It is of big importance to the people living in the less rainfall areas. They can continue seasonal crop harvesting using collected rain water even in the lack of regular water supply. Whenever it rains, rain water gets collected into the man made ponds or tanks.

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