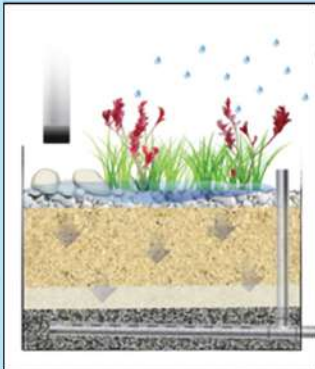


Rain Garden

The constructed wetlands such as rain garden are also practiced for the groundwater recharging.

A rain garden is a garden of native shrubs, perennials, and flowers planted in a small depression, which is generally formed on a natural slope. It is designed to temporarily hold and soak in rainwater runoff that flows from roofs, driveways, patios or lawns.. A rain garden is dry most of the time. It typically holds water only during and following a rainfall event



CIUD's Previous Works / Projects

Centre for Integrated Urban Development (CIUD) has been promoting rainwater harvesting and groundwater recharging both in the community and institutional levels under the different banners like **Recharge Kathmandu** and **Invaluable Drops** since 2004. CIUD has partnered with ADB, UNDP, UN-HABITAT, WaterAid Nepal and Lalitpur Metropolitan City (LMC) to promote easy and low cost groundwater technologies like recharge wells, filter chambers, desilting basin in various communities of LMC and Kathmandu Metropolitan City (KMC) and has also been lobbying and campaigning for the same.

Recently CIUD, in collaboration with WaterAid Nepal (WAN), had initiated rainwater harvesting and groundwater recharging in a forest patch of Ranibari in KMC and institutional area in Sanothimil Bhaktapur and has initiated the same in Lagankhel area in LMC where CIUD and WAN plan to construct 53 recharge wells, 53 filter chambers and five desilting basins for the extensive groundwater recharge in this naturally viable groundwater recharge zone.



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Recharging Kathmandu Valley

Rainwater Harvesting and Groundwater Recharging in the Kathmandu Valley: Addressing Increased Urban Water Demand



Background

Kathmandu valley, with an estimation of nearly six million inhabitants, is the most densely settled urban area in Nepal. The ever increasing population has been imposing serious threats to the natural water resources including shallow and deep groundwater of the valley. Before the introduction of the municipal water supply system, the groundwater and spring sources were the major sources of the drinking water for valley. Even today, many residents of the valley rely on these sources. The stone spouts, wells and kuwas (spring water points) are the major water outlets which can be seen everywhere in the valley.

However, the excess groundwater extraction and haphazard building constructions, roads and paved surfaces and the subsequent sealing of the natural recharge areas have led to the significance depletion of the groundwater table, thus creating acute water shortage during the dry periods .



The Kathmandu valley still has a lot of public and private areas from where the shallow groundwater recharge can be initiated. Moreover, rainwater can be harvested from any public and private building which has a good catchment area and excess rainwater can be utilized for the groundwater recharging.

Why Rainwater Harvesting and Groundwater Recharging in the Kathmandu Valley?

Kathmandu valley, with a catchment area of 656 Sq. Km, receives an average of 1500 mm (DHM) of rainfall annually and about the 80% of the houses of the valley can harvest rain mainly through the rooftops. Rainwater harvesting is a cheap, easy and reliable source of water. The water can be used for many purposes such as cleaning, washing, flushing toilets and even for drinking and cooking if it is properly filtered and stored. It is also done to divert the excess rainwater runoff to the ponds, wetlands and recharge wells for the groundwater recharge purposes as all the harvested water can be not stored.

Groundwater recharge is done mainly to store surface runoff during the monsoon. This water is then extracted through community wells, dug wells, boring and through stone spouts and spring outlets. Thus groundwater recharge helps in maintaining groundwater table and revive community wells, stone spouts and spring sources.

Groundwater recharging also helps to protect public open spaces and community ponds as these areas are considered ideal for the groundwater recharging. Moreover, the groundwater recharging also helps minimize monsoon floods and possibly minimizes the risk of collapsing of the lands of the valley due to the excess groundwater extraction.



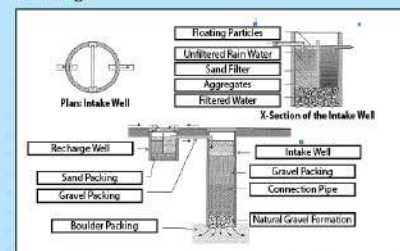
What is Rainwater Harvesting?

It is the collection of rainwater through surfaces on which the rain falls, and subsequently storing the water in a tank for later use. This involves simple materials like gutter, downpipes, first flush device, filter tank and the collection tank. The surface through which rainwater is collected is called catchment area.



What is Shallow Groundwater Recharging?

It is simply the diversion of the surface rainwater runoff into underground after the filtration. It takes place naturally when water is allowed percolate through the soil or is collected in the ponds. The groundwater can be recharged artificially when surface runoff is allowed to move into the ground through the simple techniques like construction of recharge wells with filter chambers. This may need some improvements in the surface drainage system including surface levelling.



Cross-section of a recharge well system