

14. Rain water harvesting and shallow aquifer Development

Artificial recharge is the process by which the groundwater reservoir is augmented at a rate exceeding that under natural conditions of replenishment. Any man-made scheme or facility with the objective to add water to an aquifer may be considered as an artificial recharge system.

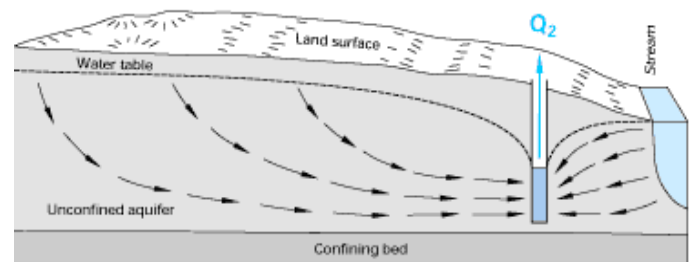
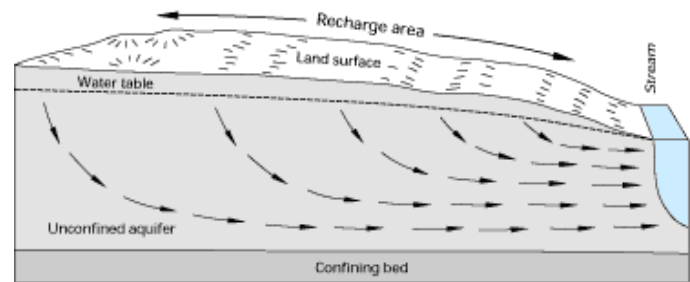
The following considerations become important before undertaking artificial recharge through surface spreading techniques.

- The aquifer to be recharged should be unconfined permeable and sufficiently thick to provide storage space
- Surface soil should be sufficiently permeable to maintain high infiltration rate
- Vadose zone should be permeable and free from clay lenses, which may cause perched water conditions
- Groundwater levels in the phreatic aquifer should be deep enough to accommodate the water table rise to avoid possible water logging condition
- The aquifer material should have moderate hydraulic conductivity so that the recharged water is retained for sufficiently long period in the aquifer and can be used at the time of need. Very high permeability results in the loss of recharged water due to subsurface outflow whereas very low permeability may come in the way of desired recharge rate.

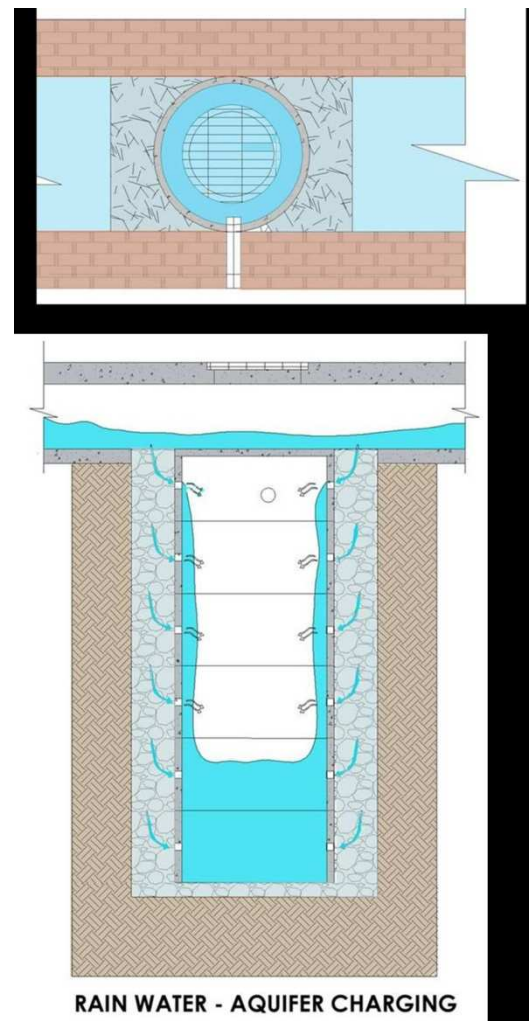
Topography plays an important role in controlling the recharge rate. Areas with gently sloping land without gullies or ridges are most suited for surface water spreading techniques.

Recharge pits

- Recharge pits are constructed for recharging the shallow aquifer
- The size varies from 1 to 2 m in width and 2 to 3 m in depth
- After excavation, the pits are refilled with pebbles and boulders
- Water to be recharged should be silt free
- Cleaning of the pit should be done periodically
- Suitable for small buildings having the rooftop area up to 100 sq.m
- Recharge pit may be of any shape i.e. circular, square or rectangular
- If the pit is of trapezoidal shape, the side slopes should be steep enough to avoid silt deposition



14.1



14.2

