Artificial Recharge

Artificial recharge is the process of increasing groundwater levels at a faster rate through human effort than the natural rate of water percolation into the ground.

Objectives

Conserve Runoff: To stop rainwater from flowing away and being wasted.

Improve Quality: To improve the quality of existing groundwater.

Reduce Saltwater Intrusion: To prevent seawater from entering freshwater aquifers.

Advantages

Cost-effective: It is more affordable than building large surface reservoirs or dams.

No Evaporation Loss: Since the water is stored underground, there is negligible loss compared to surface ponds or lakes.

Better Yield: It increases the water level in wells and borewells.

Natural Purification: The soil acts as a natural filter, often improving water quality.

No Displacement: People do not have to move away from their homes, which is a common issue with large dam projects.

Methods of Artificial Recharge

1. Surface Methods

a) Flooding Method: Spreading water over flat land so it can soak in slowly. This works best in sandy soils.

b) Ditch and Furrow Method: This involves digging a network of shallow, closely spaced ditches to spread water over the terrain.

c) Check Dams: These are small structures built across a stream to slow down water flow, giving it more time to percolate (sink) into the ground.

d) Percolation Tanks: Very common in India, these are large basins or tanks that collect rainwater during the monsoon to replenish the groundwater table, especially in hard rock areas.

2. Subsurface Methods

a) Recharge of Dug Wells: Using old or dry open wells to recharge groundwater by diverting rooftop rainwater or storm water into them.

b) Recharge Shafts: When there is a hard, non-porous layer (like clay) near the surface, a deep pit or shaft is dug through this layer to reach the sandy, porous soil below so water can sink in.

c) Vertical Recharge Shaft: A simple vertical hole (up to 15 meters deep) filled with filtering material to guide water directly into deep soil layers. An "injection well" (a smaller pipe) can be used to reach even deeper water tables.

3. Indirect Techniques

a) Watershed Management: Using land techniques like Contour Bunding and Trenching to slow down the flow of water and help it sink into the soil.

Summary

All these methods are used to store rainwater underground without wasting it, helping to raise the groundwater table for future needs.