



# SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35.



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Chennai.

## DEPARTMENT OF AGRICULTURAL ENGINEERING

**23AGT101 – INTRODUCTION TO AGRICULTURAL ENGINEERING  
I YEAR- II SEMESTER**

# Water harvesting



# Define-Water harvesting



- Water harvesting is the practice of collecting and storing rainwater or runoff from various surfaces for future use.
- It's an ancient technique that has been used for thousands of years to capture and utilize rainwater in regions with limited water resources.
- Water harvesting systems can range from simple, traditional methods to more sophisticated, modern approaches



# Types of Water Harvesting

- a. **Rooftop Rainwater Harvesting:** Collecting rainwater that falls on rooftops and directing it into storage tanks or cisterns for use in household, agricultural, or industrial applications.
- b. **Surface Runoff Harvesting:** Capturing rainwater runoff from land surfaces, roads, or paved areas and channeling it into storage ponds, reservoirs, or infiltration basins.
- c. **Land-based Rainwater Harvesting:** Implementing soil and water conservation techniques such as contour bunds, check dams, and contour trenches to capture and retain rainwater in agricultural landscapes.
- d. **Floodwater Harvesting:** Harvesting excess floodwater from rivers, streams, or floodplains during heavy rainfall events and diverting it into storage reservoirs or infiltration structures.



# Components of Water Harvesting Systems:



1. **Catchment Area:** The surface or structure from which rainwater is collected, such as rooftops, paved surfaces, or land areas.
2. **Conveyance System:** Gutters, downspouts, pipes, or channels used to transport rainwater from the catchment area to storage tanks or infiltration structures.
3. **Storage Tanks or Cisterns:** Containers or reservoirs for storing collected rainwater for later use in irrigation, domestic water supply, or other purposes
4. **Filtration and Treatment:** Filters, screens, or treatment devices used to remove debris, sediment, or contaminants from harvested rainwater before it is stored or used.
5. **Distribution System:** Pipes, pumps, or gravity-fed networks used to distribute harvested rainwater to various points of use, such as household taps, irrigation systems, or industrial processes.



# Benefits of Water Harvesting:



- a. **Water Security:** Water harvesting provides a decentralized and reliable water supply source, especially in regions with unreliable or limited access to conventional water sources.
- b. **Drought Resilience:** Stored rainwater can supplement conventional water sources during droughts or dry periods, reducing dependence on groundwater or surface water supplies.
- c. **Soil Moisture Management:** In agricultural settings, rainwater harvesting helps replenish soil moisture, improve crop yields, and reduce irrigation demand.
- d. **Erosion Control:** Harvesting rainwater runoff helps reduce soil erosion and sedimentation in rivers, streams, and water bodies, preserving water quality and ecosystem health.
- e. **Energy and Cost Savings:** By capturing and utilizing rainwater on-site, water harvesting systems can reduce energy consumption, lower water bills, and mitigate the need for costly water infrastructure projects.



# Farm ponds and Percolation ponds

- **Farm ponds and percolation ponds** are two types of water management structures commonly used in agriculture and water resource

## Farm Ponds:

- **Purpose:** Farm ponds are small reservoirs or storage basins constructed on agricultural land to capture and store rainwater runoff for various agricultural purposes.
- **Construction:** These ponds are typically built by excavating depressions in the ground and lining them with impermeable materials such as clay, geomembranes, or concrete to prevent water seepage into the soil.
- management.



# Functions:



- 1. Water Storage:** Farm ponds capture and store rainwater runoff from surrounding areas, providing a reliable water source for irrigation during dry periods or seasonal water shortages.
- 2. Groundwater Recharge:** Excess water stored in farm ponds can percolate into the soil and recharge groundwater aquifers, helping replenish local groundwater resources.
- 3. Livestock Watering:** Farm ponds provide a convenient water source for livestock grazing in agricultural areas, reducing the need for transporting water or reliance on distant water sources.
- 4. Erosion Control:** By capturing and slowing down runoff, farm ponds help reduce soil erosion, allowing sediment to settle out before water is discharged downstream.



# Percolation Ponds:



- **Purpose:** Percolation ponds, also known as recharge basins or infiltration basins, are shallow depressions or excavated areas designed to capture stormwater runoff and allow it to infiltrate into the soil to recharge groundwater aquifers.
- **Construction:** These ponds are typically designed to capture and temporarily store stormwater runoff, allowing it to percolate into the soil gradually.

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# Functions:



- **Groundwater Recharge:** Percolation ponds facilitate the infiltration of stormwater runoff into the soil, replenishing groundwater supplies and helping maintain aquifer levels.
- **Flood Control:** By capturing and temporarily storing stormwater runoff, percolation ponds help reduce peak flows in rivers and streams, mitigating the risk of downstream flooding during heavy rainfall events.
- **Water Quality Improvement:** As stormwater infiltrates through the soil in percolation ponds, natural filtration processes remove pollutants and contaminants, improving water quality before it reaches groundwater aquifers or surface water bodies.
- **Habitat Creation:** Percolation ponds can provide habitat for wildlife and aquatic species, enhancing biodiversity and ecosystem services in urban and rural landscapes.

A green marker is shown writing the words "THANK YOU" on a white card. The word "THANK" is written in green, and "YOU" is written in red. The card is placed on a background of lush green foliage, with a small white flower visible on the right side.

THANK  
YOU