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FACULTY OF AGRICULTURAL SCIENCES & ALLIED INDUSTRIES

Rainfed Agriculture and Watershed Management

Lecture -13

Water Harvesting:

- The process of runoff collection during periods of peak rainfall in storage tanks, ponds etc., is known **as water harvesting**. It is a process of collection of runoff water from treated or untreated land surfaces/ catchments or roof tops and storing it in an open farm pond or closed water tanks/reservoirs or in the soil itself (in situ moisture storage) for irrigation or drinking purposes.
- Runoff farming and rainwater harvesting agriculture are synonymous terms, which imply that farming is done in dry areas by means of runoff from a catchment. Runoff farming is basically a water harvesting system specially designed to provide supplemental or lifesaving irrigation to crops, especially during periods of soil moisture stress.
- Collecting and storing water for subsequent use is known as **water harvesting**. It is a method to induce, collect, store and conserve local surface runoff for agriculture in arid and semiarid regions.
- All water harvesting systems have **three components** viz., the catchment area, the storage facility and the command area. The catchment area is the part of the land that contributes the rain water. The storage facility is a place where the runoff water is stored from the time it is collected until it is used. The command area is where water is used.

Methods of Water Harvesting

- The different methods of water harvesting that are followed in arid and semiarid regions are discussed separately.

Arid Regions

Water Spreading: In arid areas, the limited rainfall is received as short intense storms. Water swiftly drains into gullies and then flows towards the sea. Water is lost to the region and floods caused by this sudden runoff can be devastating often to areas otherwise untouched by the storm.

Micro catchments: A plant can grow in a region with too little rainfall for its survival if a rain water catchment basin is built around it. At the lowest point within each micro catchment, a basin is dug about 40 cm deep and a tree is planted in it. The basin stores the runoff from micro catchment.

Traditional water harvesting systems: Tanka, nadi, khadin are the important traditional water harvesting systems of Rajasthan.

Tanka is an **underground tank** or cistern constructed for collection and storage of runoff water from natural catchment or artificially prepared catchment or from a roof top.

Nadi or village pond is constructed for storing water from natural catchments. The capacity of nadi's ranges from 1200 m^3 to 15000 m^3

Khadin is unique land use system where in runoff water from rocky catchments are collected in valley plains during rainy season. Crops are grown in the winter season after water is receded in shallow pond on the residual moisture.

Semiarid Regions

Dug Wells: Hand dug wells have been used to collect and store underground water and this water is lifted for irrigation. The quality of water is generally poor due to dissolved salts.

Tanks: Runoff water from hill sides and forests is collected on the plains in tanks. The traditional tank system has following components viz., catchment area, storage tank, tank bund, sluice, spill way and command area.

Percolation Tanks: Flowing rivulets or big gullies are obstructed and water is ponded. Water from the ponds percolates into the soil and raises the water table of the region.

Farm Ponds: These are small storage structures for collection and storage of runoff water. Depending upon their construction and suitability to different topographic conditions farm ponds are classified as

- Excavated farm ponds suitable for flat topography
- Embankment ponds for hilly terrains and
- Excavated cum Embankment ponds

There are three types of excavated farm ponds – square, rectangular and circular. Circular ponds have high water storage capacity. Farm ponds of size 100 to 300 m^3 may be dug to store 30 per cent of runoff.