Rainwater harvesting

Definition: Rainwater harvesting is the simple process or technology used to conserve Rainwater by collecting, storing, conveying and purifying of Rainwater that runs off from rooftops, parks, roads, open grounds, etc. for later use.

Components of Rainwater Harvesting:

Rainwater harvesting systems consists of the following components:

1. Catchment- Used to collect and store the captured Rainwater.
2. Conveyance system – It is used to transport the harvested water from the catchment to the recharge zone.
3. Flush- It is used to flush out the first spell of rain.
4. Filter – Used for filtering the collected Rainwater and remove pollutants.
5. Tanks and the recharge structures: Used to store the filtered water which is ready to use.

- The process of rainwater harvesting involves the collection and the storage of rainwater with the help of artificially designed systems that run off naturally or man-made catchment areas like- the rooftop, compounds, rock surface, hill slopes, artificially repaired impervious or semi-pervious land surface.
- Quite obviously, several factors play a vital role in the amount of water harvested. Some of these factors are:
- The quantum of runoff
- Features of the catchments
- Impact on the environment
- Availability of the technology
- The capacity of the storage tanks
- Types of the roof, its slope and its materials
- The frequency, quantity and the quality of the rainfall
- The speed and ease with which the Rainwater penetrates through the subsoil to recharge the groundwater.

Advantages of Rainwater Harvesting:

1. Less of cost.
2. Helps in reducing the water bill.
3. Decreases the demand for water.
4. Reduces the need for imported water.
5. Promotes both water and energy conservation.
6. Improves the quality and quantity of groundwater.
7. Does not require a filtration system for landscape irrigation.
8. This technology is relatively simple, easy to install and operate.
9. It reduces soil erosion, storm water runoff, flooding, and pollution of surface water with fertilizers, pesticides, metals and other sediments.
10. It is an excellent source of water for landscape irrigation with no chemicals and dissolved salts and fee from all minerals.

Disadvantages of Rainwater Harvesting:

In addition to the great advantages, the rainwater harvesting system has few disadvantages like unpredictable rainfall, unavailability of the proper storage system, etc.

1. Regular Maintenance is required.
2. Requires some technical skills to install.
3. Limited and no rainfall can limit the supply of Rainwater.
4. If not installed correctly, it may attract mosquitoes and other waterborne diseases.
5. One of the significant drawbacks of the rainwater harvesting system is storage limits.

Methods of Rainwater Harvesting:

The different methods of rainwater harvesting include:

- **Rooftop rainwater harvesting**: Rooftop Rain Water Harvesting is the technique through which rain water is captured from the roof catchments and stored in reservoirs. Harvested rain water can be stored in sub-surface ground water reservoir by adopting artificial recharge techniques to meet the household needs through storage in tanks.
- **Surface runoff harvesting:** Surface runoff water harvesting is the collection, accumulation, treatment or purification, and storing of storm water for its eventual reuse. It can also include other catchment areas from manmade surfaces, such as roads, or other urban environments such as parks, gardens and playing fields.
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- **First, flush:** First flush is the initial surface runoff of a rainstorm. During this phase, water pollution entering storm drains in areas with high proportions of impervious surfaces is typically more concentrated compared to the remainder of the storm.
- **Transportation:** Transport generally marks the passage from one stage of the post-harvest system to the next. Transport, whether traditional or mechanized, is needed to move the agricultural commodities.
- **Catchment:** The catchment of a water harvesting system is the surface which directly receives the rainfall and provides water to the system. It can be a paved area like a terrace or courtyard of a building, or an unpaved area like a lawn or open ground.
- **Filter:** The filter is used to remove suspended pollutants from rainwater collected over roof. A filter unit is a chamber filled with filtering media such as fibre, coarse sand and gravel layers to remove debris and dirt from water before it enters the storage tank or recharges structure.