

Rainwater Harvesting Program

at

University of Sumer

1/10/2022

By Hussein Kh. Chlaib

The director of the global ranking unit/ Assist. dean for scientific affairs

All living things including plants, animals and human beings need water to live and to carry out different cellular activities.

Have you ever imagined a day without water?

No, we have not and it is hard to imagine. We all use water for different kinds of day to day activities, such as cleaning, washing, bathing, cooking, drinking and other domestic and industrial uses.

Water is a precious, essential and an biotic component of the ecosystem. Today we all are heading toward the scarcity of water, and this is mainly because of the lack of water conservation and pollution of water bodies. So, let us not waste a drop of water and start conserving water for further use.

There are different methods used for conserving water; this article explains the rainwater harvesting system with a simple diagram.

Rainwater Harvesting Diagram

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.

Here, let us have a look at the diagram of rainwater harvesting system.

RAIN WATER HARVESTING



How to Harvest the Rainwater?

Rainwater harvesting systems consists of the following components:

- Catchment- Used to collect and store the captured rainwater.
- Conveyance system – It is used to transport the harvested water from the catchment to the recharge zone.
- Flush- It is used to flush out the first spell of rain.
- Filter – Used for filtering the collected rainwater and removing pollutants.
- 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.

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.

Why do we Harvest Rainwater?

The rainwater harvesting system is one of the best methods practiced and followed to support the conservation of water. Today, scarcity of good quality water has become a significant cause of concern. However, rainwater, which is pure and of good quality, can be used for irrigation, washing, cleaning, bathing, cooking and also for other livestock requirements.

Advantages of Rainwater Harvesting

The benefits of the rainwater harvesting system are listed below.

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

Disadvantages of Rainwater Harvesting

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

Listed below are a few more disadvantages of the rainwater harvesting process.

- Regular maintenance is required.
- Requires some technical skills for installation.
- Limited and no rainfall can limit the supply of rainwater.
- If not installed correctly, it may attract mosquitoes and other waterborne diseases.
- One of the significant drawbacks of the rainwater harvesting system is storage limits.

What do you understand by rainwater harvesting?

Rainwater harvesting is the process of accumulation and storage of rainwater for reuse rather than allowing it to runoff.

What are the different methods of rainwater harvesting?

The different methods of rainwater harvesting include:

- **Rooftop rainwater harvesting** – The rooftop becomes the catchments, and the rainwater from the building and houses are collected. The components of the rooftop rainwater harvesting are:
 1. First, flush.
 2. Transportation.
 3. Catchment.
 4. Filter.
- **Surface runoff harvesting** – It is the system that collects rainwater, which flows away as surface runoff. The runoff rainwater is caught and used to recharge aquifers by adopting appropriate techniques.

What is the importance of rainwater harvesting?

Rainwater harvesting is a sustainable process that helps in preserving water for future needs. Water scarcity is a major concern in today's scenario. The process of rainwater harvesting is a good way to conserve water.

How Can We Conserve Water?

Water is one of the basic necessities for every living being and we cannot imagine a life without water. It is the natural resource and the main constituent of our planet earth. Water is the universal solvent and plays a key role in the existence of various forms of life on the planet earth. It is widely used for various purposes such as washing, bathing, cleaning, cooking, drinking, and other industrial and domestic uses.

Water is a colourless and odourless substance that is essential for the survival of living beings. There are various sources of water such as wells, rivers, ponds, lakes, oceans, big dams, and streams. As we all know, nearly 70 to 80 percent of the Earth's surface is covered by water, among which only 1-2 per cent water is pure and suitable for human use.

What is Conservation of Water?

Conservation of water mainly refers to protect, preserve, and control the usage of water and its resources. It is the system introduced to manage freshwater, reduce the wastage and protect the water and its resources in order to reduce and to avoid the scarcity. Therefore, we all should come forward to create awareness about conservation of water among our own friends, family, neighbours, society, etc. Conservation of water is very much essential as it saves life on earth.

Why do we need to Conserve Water?

Conserving water helps us by supplying more amount of water for longer usage. It has become necessary in all areas because these natural resources are reducing along with the increasing population and their usages.

There are several ways to conserve water. Here are some important and easy ways for the conservation of water

- Keeping the tap closed when not in use.
- Check for the openings or leaks in water distribution pipes.
- Make sure to use collected rainwater for gardening or washing purpose.
- Always have a measure of how many buckets of water is wasted in a day and try to reduce.
- Do not run more water than necessary while washing and cleaning clothes, utensils, etc.
- Do not prolong your bathing. Go for a quick shower rather than wasting buckets of water
- Rainwater harvesting is one of the best method used for conserving water. There are different methods used to preserve rainwater instead of getting it wasted.

Farmers can also contribute to this system of conservation of water by using Drip irrigation system in their fields. This is a type of irrigation system which can be practiced by all framers to save water. In this system, water is directly supplied to the plant roots and prevents water from being wasted by evaporation.

These were a few information on how can we Conserve Water, and some preventive measures are taken to Conserve Water.

Stay tuned with BYJU'S to learn more in detail about the best and different ways to conserve water.

University of Sumer location characterization

The faculties of UOS located in Thi-Qar governorate, the climate of this location is arid and received very little amount of rain (about 250 mm/year), it is about 100mm/year. the total area of the university is about 28428m².

UOS harvesting program

UOS tried to apply rainwater harvesting because it knows that water is the generator of the life, so it does its best in this project. All buildings' roofs are non-porous surfaces made of non-permeable materials like cement. All surfaces are inclined towards pipes connected to the surface of the earth, and these pipes collect water from the surfaces and direct it towards secondary surface streams.

For the purpose of collecting this water for all Sumer University buildings, we need additional infrastructure such as subsurface concrete tanks, iron tanks, or durable plastic tanks. The sizes of these tanks must be appropriate with the quantities of water expected to be harvested.

This water can be used directly after it is collected for the purpose of washing the floors of buildings, watering plants, or using it in toilets and other uses. We can also dig groundwater wells and direct the harvested surface water to them to avoid mixing clean and pure rainwater with sewage or polluted water, and thus we have enhanced the groundwater that can be used for various purposes. This project is very simple and we can do it.

According to the annual average rainfall for Thi-Qar which is about 250mm we can harvest about **22800 m³** of rain water annually.

