

## Unit 2 : Water Conservation

### Chapter 2: Concept of Water Conservation

#### Distribution of rain water

In nature, there is the season cycle of summer, monsoon and winter. The water required for life is available to us during the monsoon season. Not all parts of Maharashtra receive uniform rainfall. The water that falls during the rainy season naturally seeps into the soil. Some is stored as surface water. In addition, some of this water evaporates, some is used directly by some plants, and the rest is carried away in the form of runoff. A runoff is a stream of water flowing over the surface.

The water sources found in the hills, river basins and wells in the form of springs start depleting within a few days after the end of monsoon. At such times water is needed. Some areas are constantly facing drought conditions. In such cases, it is necessary to stop this wasted runoff and collect the maximum amount of rain water, store it in a suitable place or bury it in the ground.

#### What is Water Conservation?

"Water Conservation" is the use of man-made measures to block, store and intake the rainwater in an area by constructing various structures and allowing it to be used for drinking, consumption, industry and agriculture until the next monsoon.



**2.2.1 Mountain slopes, streams, deforestation and water and soil carried away due to them.**

#### Increasing Need of Water Conservation:

Recently the rainfall period and simultaneous rainfall have become erratic. Four months of low but continuous rains have now become erratic due to climate change. There are frequent instances where the maximum rainfall falls in a short period of time and the dry period of two rains lasts a long time. Eventually, the amount of infiltration of running rain water is declining.

Trees control the speed of rainwater. The roots of the trees carry the water from the surface to the ground. Water is being carried away from the land rapidly due to the disparity in large scale deforestation and tree planting.



**2.2.2 Problems arisen due to lack of water conservation.**

After building a house in town or village, a thick layer of cement and sand is spread in the space around the house. As a result, the area and the rate of infiltration of water into the soil is greatly reduced.

Water is still available as much as it used to be available in the past, but water consumption is also increasing due to huge population growth. The amount of water available from water conservation and the amount of water used is declining drastically. Considering all these factors, there is a need for water management and water conservation.

#### **Usefulness of water conservation:**

With a view to economic development of rural areas of the state based on public participation as well as natural resources, the following can be achieved through water conservation:

**Sustainability :** If the abstraction/lifting of water from the catchment area is less than the recharge rate and also the reduction in per capita water consumption, water retention will occur unknowingly and a sustainable water supply can be ensured.

**Energy conservation:** Electricity is used for water management. 15% electricity is used for this. Reducing water consumption will also save energy and conserve energy.

**Habitat Conservation:** Reducing the use of freshwater will keep freshwater reservoirs intact and protect the organisms from drying out.

#### **Rainwater harvesting:**

Rainwater harvesting is the process of diverting, infiltrating, and making rainwater available in the same area, in the right place, in the right way, for later use. There are two types of this,

**A. Temporary use:** When it is raining, store rainwater (enough for about 4-5 days ) and use it.

**B. Use after the end of the rainy season:** Store rainwater in tanks, wells, borewells, or other places and use it after the end of the rainy season.

Rainwater harvesting can be done perfectly in both cities and villages, and its benefits are well documented.

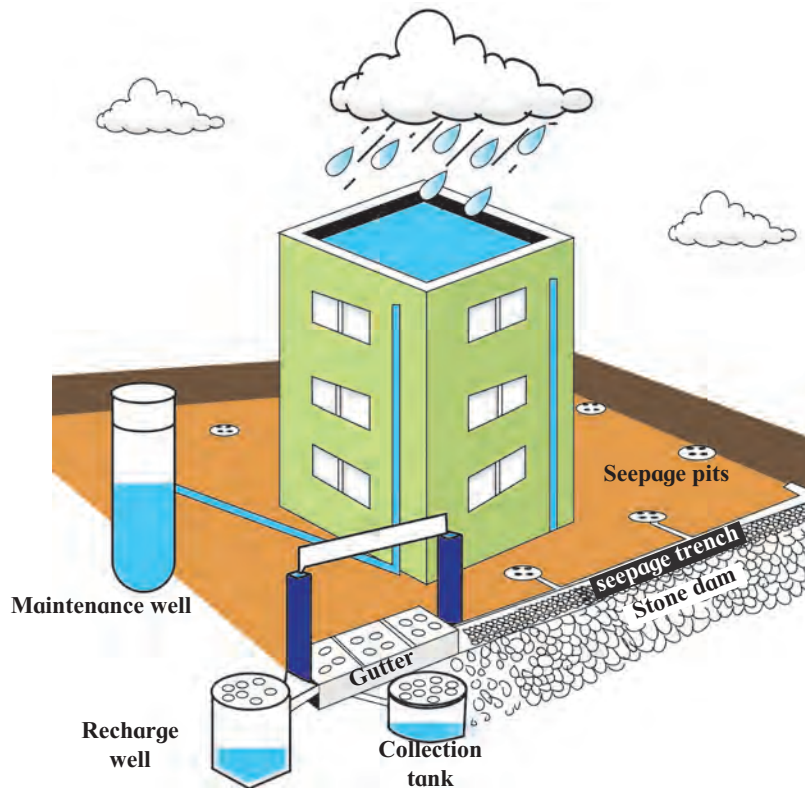
#### **Urban Water Conservation:**

When it rains in the city, water falls from the roof of the building. It is carried down through the pipes in most places to the municipal drain. From there it converges and flows into nearby streams, runnels, rivers, creeks, or seas.

Depending on the surface of the land, the amount of water that will be absorbed and carried is determined. The surface also determines, if the water will be absorbed or carried away. If there is open ground or soil, 50% of the falling water settles in the soil. But if it is concrete, hardly 10% won't be absorbed, most of the water is carried away.

In the past, there was soil in the premises of the buildings. There are lot of grounds and open spaces are available. So the water would first seep into the ground and then come out of the yard. So the water came slowly and it took time to fill the runnels. Now, due to depletion or disappearance of soil, the water immediately and completely enters the runnels and creates flood-like conditions in the area. This is currently happening all over the cities and there is also negligence in constructing unauthorized buildings, roads and sidewalks (where they are), road dividers. This is compounded by irregularities in non-sanitation or alleged irregularities in waste disposal, etc., and this creates the current dire situation.

Due to concreting of most parts of the city, it cannot be used for water infiltration. In addition, it is seen how the rainwater will go towards the sea as soon as possible. As a result, the water content of the soil has decreased. This leads to flooding in the rainy season and water scarcity in the summer. This picture can definitely change if rainwater harvesting is done in every building. If the wells, borewells, etc. in the area are recharged, the life of those sources will be extended but the picture is not



### 2.2.3 Water Conservation

visible as floods in monsoons and scarcity in summers. And, most importantly, the area is self-sufficient in water, not completely dependent on the government for water. Only, it requires public participation.

#### Water Conservation in Rural Area:

The water requirement of the village can be met by diverting, infiltrating and storing water in the same area. It needs to be considered not only for drinking but also for domestic use, for cattle, for other uses, and for the second and third season crops.

If water conservation is planned and implemented the village location, the population, the water requirement of the village, the water sources, their capacity, water requirement for agriculture, number of cattle in the village, land type, soil type, number of layers, depth of the rock, the slopes etc., are the factors considered, it is sure to be successful. If water conservation is to be successfully implemented for a long time, it requires the participation of local people.



### 2.2.4 Water storage method

#### Try this:

1. Create a table of water conservation practices in urban and rural areas
2. Visit different forts and record observations for water conservation structure.
3. Carry out water conservation activities with the help of teachers to retain rainwater in the school premises.



### Benefits of Rainwater Harvesting:

1. Existing water sources are strengthened.
2. Improves water quality.
3. Prolongs the life of a well or borewell.
4. Waterlogging, flooding, etc. can be avoided.
5. The salts in the water of the borewell can be reduced and the water can be made drinkable.
6. The journey towards water self-sufficiency continues.
7. No need to rely entirely on the government for water .

### The Department of Water Conservation :

It was established by the Government of Maharashtra on June 5, 1992 . The department has been entrusted with the responsibility of monitoring important Central and State sponsored schemes like Water conservation, Soil Conservation, Integrated Watershed Development, Minor Irrigation, Wasteland Development. As on 31<sup>st</sup> May 2017, the Department of Water Conservation has been restructured by the government and a separate Department of Soil and Water Conservation has been set up. Its functions are, with minimum land acquisition process, implementation of small and medium scale irrigation projects at low cost in 1 to 2 years, raising of ground water level, siltation for large and medium projects, prevention of soil erosion, creation of decentralized water reservoirs.

To carry out rapid development and regulation of watershed and water conservation works including minor irrigation projects and to make special provision for related matters, the Maharashtra Water Conservation Corporation was established on 22<sup>nd</sup> August, 2000 and is headquartered at Aurangabad. The department has a 21% share in the total generated irrigation capacity of the State.

### Historical water conservation structure

Whether it is on an ocean island, near the shore, whether it is a urban fort or a mountain fort, it is easy to see that rain water was being conserved and the required water was being made available. On-site structures were constructed and maintained with proper care to ensure adequate water supply to the people in the area through wells, tanks, lakes, ponds, pushkaranis etc.

### Measures taken on sea forts:

If you observe Colaba, Janjira, Sindhurg or any other sea fort, you will notice that despite the salt water all around, all these forts have fresh water reserves, in the form of lakes or wells! How was this possible? This is an excellent example of on-site water conservation. While constructing the ramparts of the fort, care was taken that rain water falling in the vicinity of the fort would not be carried out. A water reservoir was built on the fort and then that water was used throughout the year as needed. Many measures were taken in construction and design to reduce the evaporation of that limited water reserve. Care was taken to ensure that direct sunlight did not reach the water, and that the water remained clean. All of this is still working properly today.



### 2.2.5 Pond/ lake at Murud Janjira fort

### Water conservation on hill and urban forts:

There are many examples of water conservation on such forts in almost all

parts of the country. Water conservation and management measures are also used in places like Naldurg or Onsa on land, most of the hill forts in Maharashtra as well as sea forts. Here too, while constructing the ramparts of the fort, care was taken that the rain water falling in the vicinity of the fort would not be carried out. This water was infiltrated into the area, then used for wells and stored in ponds or tanks. Even today we see this system working properly. Using this principle, fresh water was provided by water conservation and management even on marine forts.



**2.2.6 Lake at Raigad fort**

### Exercise

1. What is water conservation?
2. Explain the division of rainwater.
3. Why do you think water conservation is needed?
4. In which type of soil, water conservation is done? what care needs to be taken?
5. Explain the usefulness of water conservation.
6. What are the functions of Maharashtra Water Conservation Department?
7. Why are there limitations in rainwater harvesting in urban areas? How can water conservation be done through public participation?