

9. Water Resources Development

- 1 Discuss various types of surface and sub-surface water sources.

⇒ Surface Water Sources

- 1 The most of the surface water collect from precipitation in the form of rainfall.

Surface water is located on top of the earth's surface.

There are four various type of surface water sources:

- 1 Sea Water:

Sea Water is the biggest sources of surface water on earth.

The sea contain 97% of the water on the earth.

But sea water, human can not use directly because, this water contain highly concentration of salt.

This water is only use after the desalting.

Due to the high concentration of salt this water is not economical.

2 Ponds and Lakes:

A small area of the water filled by water called ponds.

Ponds are smaller than the lakes.

The quality of a water in a lake is generally good.

The quantity of water available from lakes is generally small.

3 Streams and Rivers:

Streams is the continuous movement of a water on earth's surface.

River is a large and natural flow of water that goes across land of earth's surface.

Streams are smaller than the rivers.

Rivers are the most important sources of water for public water supply schemes.

Rivers are generally feed by rains during seasons.

4 Impounding Reservoirs:

This artificial lake formed on the upstream side of the dam is known as reservoirs.

The water stored in this reservoirs can be used for multiple purposes.

=> Sub-surface water sources.

There are mainly two types of sub-surface water sources.

1 Unconfined Aquifer:

Unconfined aquifer is upper water surface is at atmospheric pressure.

Unconfined aquifers are usually recharged by rain or streamwater.

Unconfined Aquifer are generally found located near the land surface.

2 Confined Aquifer:

A confined aquifer is an aquifer below the land surface that is saturated with water.

Confined aquifer occur from near surface to deeper than 9000 metres.

2 Discuss water requirement for different uses.

There are four type of water requirement for different uses.

1 Water requirement for Municipal and Industrial supplies:

Water is the first requirement for municipal and industrial activities.

Water is require for the different uses like, domestic use, industrial use, commercial use, water losses.

The quantities of water required for domestic use is 135 litres per day per person.

The quantities of water required for Industrial use is 50 litres per day per person.

The quantities of water required for commercial use is 20 litres per day per person.

This are the basic water requirements for Municipal Supplies.

2. Water requirement for Irrigation:

Water is the basic requirement for any irrigation.

For proper growth and maturity of the crops required some quantities of water.

Every crop require a certain quantities of water to the irrigation.

The quantities of water required for Sugarcane, wheat, Rice is very high compare the another crop.

3 Water Requirements For Hydropower Generation:

Water is the basic requirement for Hydropower generation.

Production of electric power by using the flowing water.

Hydroelectric ~~wa~~ power is generated by running the flow of water on the turbine blades.

Water is vital for the hydropower generation.

4 Water Requirements For Navigation and Recreation:

Inland navigation generally refers to the transport with ships of inland water way.

This are the basic requirement of water in different use.

3 What is a hydraulic structure?

A hydraulic structure is a structure that can be submerged in any body of water.

Hydraulic structure can be used to divert, disrupt or completely stop the flow of water.

A Hydraulic structure can be built in rivers, a sea or any body of water.

Hydraulic structure is a need for a change in the natural flow of water.

Hydraulic structure may also be used to measure the flow of water.

Examples: Dams, Spillways, Flumes etc.

⇒ Classify the dams and discuss any one with neat sketch.

A Dams are hydraulic structure which can stop the flow of water in river.

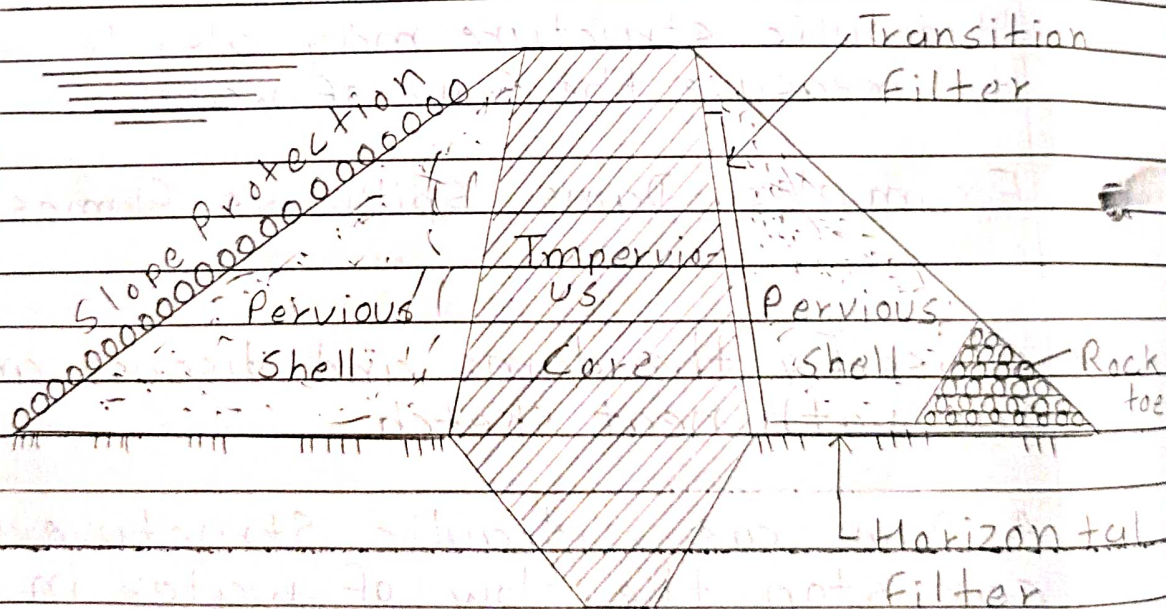
There are different types of dams structure is build.

- 1 Gravity dam
- 2 Earth dam
- 3 Rock Fill dam
- 4 Arch dam
- 5 Buttress dam etc.

⇒ Earth dam:

Earth dam are made of locally available materials like soils and gravels.

Earth dam is most economical dam.



Earth dam is a large artificial dam.

These dams usually provides most satisfactory solution for site.

This dam construction requiring a minimum of processing.

Earth dams are now becoming more common, even for higher heights.

Ex. Ukai dam in Gujarat.

4 List out various methods of conservation of water. Discuss any one method in brief.

Water conservation is the practice of using water efficiently, to reduce unnecessary water usage.

There are three methods of conservation of water.

1 Domestic Conservation

2 Industrial Conservation

3 Agricultural Conservation.

=> Agricultural Conservation:

In Agricultural Conservation we can use following method.

- 1 Use improved irrigation method.
- 2 Use lined canals which reduce evaporation.
- 3 Farmers are drought tolerant crops which use less water.
- 4 Collect and store rainwater for the farming.
- 5 Laser land leveling reduces the ratio of runoff.
- 6 Use drip irrigation in crops.
- 7 Use Black Plastic which is keep soil warmer in cool climates.
- 8 Use Gated Pipe irrigation which is spread water in soil.

5 What is rain water harvesting?
Write its benefits.

Rain water harvesting is one method of Agricultural water conservation.

In Rain water harvesting is method of collect rainwater in tanks.

Rain water harvesting can be practiced in homes, offices, parks etc.

=> Benefits:

1 Rain water harvesting is reduce water consumption.

2 Rainwater collection is easy to install.

3 Rainwater is use different purposes in different ways.

4 Rainwater harvesting helps utilities reduce peak demands during summer.

5 Rainwater can be perfect primary water source.

6 Rainwater harvesting reduce stormwater runoff.

7 Rainwater harvesting is an excellent source of water for irrigation.

8 Rainwater harvesting reduces the amount of the water that a municipality has to treat

9 Rainwater harvesting can provide an independent water source in irrigation.

6 What are the objectives of conservation of water?

This are the main objectives of conservation of water.

1 To reduce run off loss of Rainwater.

2 To reduce ground water contamination.

3 Recharging the ground water.

4 To reduce soil and water losses.

5 Improvement knowledge of the main network.

6 To improve Public awareness.

7 To improved pressure and water quality.

8 To increase water penetration and conserve soil moisture.

9 Reducing human water consumption.

10 To raise the water table by recharging ground water.