

WATER RESOURCES

Water

- Water is a renewable resource.
- Three - fourth of the earth's surface is covered with water but only a small proportion of it accounts for fresh water fit for use.

Some facts and figures

- 96.5 percent of the total volume of world's water is estimated to exist as oceans and only 2.5 percent as fresh water.
- India receives nearly 4 percent of the global precipitation and ranks 133 in the world in terms of water availability per person per annum.
- By 2025, it is predicted that large parts of India will join countries or regions having absolute water scarcity.

Water scarcity and need for water conservation and management

- The lack sufficient water as compared to this demand in a region is known as water scarcity
- Causes of water scarcity are
 - Over exploitation
 - Excessive use and unequal access to water among different social groups
 - Large population

Dams

- A dam is a barrier across flowing water that obstructs, directs or retards the flow often creating a reservoir, lake or impoundment

Multi-purpose river projects

- Multipurpose river projects large dams that serve several purposes in addition to impounding the water of a river and used later to irrigate agriculture fields. e.g. the Sutlej, Beas river basin, Bhakra Nangal projects etc.

Advantage of multipurpose river projects are

- ❖ Electricity generation
- ❖ Irrigation
- ❖ Water supply for domestic and irrigation uses
- ❖ Flood control
- ❖ Recreation
- ❖ Inland navigation
- ❖ Fish breeding

Disadvantage of multipurpose river projects are

- It affects natural flow of river causing poor sediment flow and excessive sedimentation at the bottom of the reservoir
- It destroys the habitat for the rivers 'aquatic life '
- It submerges the existing vegetation and soil if created on the flood plains
- It displaces the local people of the place where it is created.
- These are unsuccessful in controlling floods at the time of excessive rainfall.
- These projects induced earthquakes, caused water –borne diseases and pests and pollution resulting from excessive use of water.
- The Multipurpose projects provide about 22 % of the total electricity in India.

Movements against multi-purpose river projects

These projects cause of many new social movements like the 'Narmada Bachao Andolan and the Tehri Dam Andolan 'etc.

This is due to the large –scale displacement of local communities.

Inter-state water disputes are also becoming common with regard to sharing the costs and benefits of the multi-purpose project.

Rain water harvesting

Rainwater harvesting refers to the practice of storing and using of rainwater from the surface on which it falls.

In hill and mountainous regions people built diversion channels like the 'guls' or 'kuls' of the western Himalayas for agriculture.

In Rajasthan, 'rooftop rain water harvesting' was commonly practised to store drinking water.

In arid and semi- arid regions agricultural fields were converted into rain fed storage structures that allowed the water to stand and moisten the soil.

In the semi-arid and arid regions of Rajasthan, almost all the houses traditionally had underground tanks or tankas for storing drinking water.

DID YOU KNOW!

- The rooftop rainwater harvesting is very popular in Shillong (Meghalaya). In This region, Cherapunjee and Mawsynram (about 55 km away from Shillong) receive the highest rainfall in the world. But Shillong faces acute scarcity of water. Every house in the city has rooftop rainwater system.

How tankas works ?

Tankas were connected to the sloping roofs of the houses through a pipe.

Rain falling on the rooftops would travel down the pipe and was stored in these underground 'tankas.'

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Q.1. Multiple Choice Questions

i. Ans.

Not suffering from water scarcity:

- a. Region with high annual rainfall.
- b. Region having low rainfall and low population.

Suffering from water scarcity:

- c. Region with high annual rainfall and large population.
- d. Region having high annual rainfall but water is highly polluted.

ii. Ans. (c) Multipurpose projects lead to large scale displacements and loss of livelihood.

iii. Ans.

- (a) Multiplying urban centres with large and dense populations and urban lifestyles have not helped in proper utilization of water resources.
- (b) Regulating and damming of rivers affects the river's natural flow and its sediment flow.
- (c) In Gujarat, the Sabarmati basin farmers were agitated when higher priority was given to water supply in urban areas, particularly during droughts.
- (d) Today in Rajasthan, the practice of roof top rain water harvesting has gained popularity because most of the areas of Rajasthan are suffering from water scarcity despite the construction of Rajasthan Canal.

Q.2. Answer the following questions in about 30 words:

(i) Explain how water becomes a renewable resource.

Ans. It becomes renewable resource through hydrological process or cycle comprising evaporation, condensation and precipitation. During the process of evaporation, the impurities are left over lithosphere are water is distilled.

(ii) What is water scarcity and what are its main causes?

Ans. Water scarcity is water shortage. Water scarcity is caused due to over-use, misuse, use of pesticides, emissions of pollutants from industries, lack of proper management, lack of water treatment plants, mass ignorance and careless attitude, location setting, land forms and change in climate.

(iii) Compare the advantages and disadvantages of multipurpose river projects.

Ans. Advantages of Multipurpose River Projects:

- (i)** Such projects help in checking floods.
- (ii)** Ample water is available for irrigation.
- (iii)** These projects help in electricity generation.
- (iv)** Water of these projects is used for domestic supply and industrial uses.
- (v)** Generally, surrounding areas of these projects are developed into tourist and picnic spots.
- (vi)** These are used for inland navigation and fish-breeding.

Disadvantages of multipurpose river projects:

- (i)** In the process of construction of a dam, people living in a large area are evicted and displaced.
- (ii)** Land nearby a dam suffers from seepage, water-clogging and immersion condition.
- (iii)** As slight cleft or rift in the wall of a dam may result in inundation of vast area around and loss of human lives and property.
- (iv)** A dam submerges the existing vegetation in the vast region around it. Soil erosion, landslides and a rupture is formed in the parental rock.

Q.3. Answer the following questions in about 120 Words:

- (i) Discuss how rainwater harvesting in semi-arid regions of Rajasthan is carried out.**

Ans. In the semi-arid and arid regions of Rajasthan, particularly in Bikaner, Phalodi and Barmer, almost all houses traditionally have underground tanks or tankas for storing drinking water. The tanks are as large as a big room; one household in Phalodi has a tank measuring 6.1 metres deep, 4.27 metres long and 2.44 metres wide. The tankas are parts of the well-developed rooftop rainwater harvesting system and are built inside the main house or the courtyard. Slopping roofs of the homes are connected through pipe. The rain water falling on the rooftops would travel down the pipe and thus, stored in these underground 'tankas'. The first spill of rain is usually not collected as this would clean the roofs and the pipes but the rainwater from the subsequent showers is collected by people there.

(ii) Describe how modern adaptations of traditional rainwater harvesting methods are being carried out to conserve and store water.

Ans. Roof-top rainwater harvesting is done through construction of underground tankas in main house or in the courtyard. Tanks are generally, 6.1 metres deep, 4.27 metres long and 2.44 metres wide. Rain water from the roof is connected to a pipe that carries it to the underground tankas. It is being practiced in shilling, Meghalaya, rajasthan (Bikaner, Phalodi and Barmer districts).

In Gendathur of Mysore district in Karnataka, about 200 households have installed this roof-top rainwater harvesting system. Each house, thus, obtains 50,000 litres of water annually. Similarly, Tamil Nadu is the first and the only state where roof-top rainwater harvesting system has been made compulsory for all the houses across the state. There are legal provisions to punish the defaulters.