

CHAPTER 3 WATER RESOURCES

ACTIVITY AND IN TEXT QUESTIONS

Q 1. From your everyday experiences, write a short proposal on how you can conserve water.

Ans 1.

- ❖ Create a group with friends and neighbors who are mindful of water conservation, encouraging others to join in this collective effort.
- ❖ Regularly check for and fix any leaks at home to prevent water wastage.
- ❖ Turn off the tap when brushing teeth or washing your face to save water.
- ❖ Avoid unnecessary flushing of the toilet to reduce water usage.
- ❖ When washing the car, opt for a bucket rather than a hose to use less water.
- ❖ Reuse water from rinsing vegetables, rice, or lentils—this can be repurposed for watering plants or cleaning floors.

Q 2. Find out more about any one traditional method of building dams and irrigation works.

Ans 2.

- 1) Located roughly 130 km from Pune in the Western Ghats, one of the oldest waters harvesting systems was developed to supply drinking water along an ancient trade route. Numerous tanks were carved into the rocks to store water, providing a vital resource for traders. Each fort within this region had its own unique system for harvesting and storing water, utilizing rock-cut cisterns, ponds, tanks, and wells.
- 2) In mountainous areas, local communities constructed diversion channels, such as the 'guls' and 'kuls' of the Western Himalayas, to support agricultural needs.

Q 3: Collect information about floods occurred in different parts of the country due to heavy rainfall in recent times.

Ans 3: Recent heavy rainfall events have led to severe flooding across several regions in India:

1. Vijayawada, Andhra Pradesh: Torrential rains caused breaches in the Budameru Bund and diverted channels, flooding residential areas and displacing thousands. Authorities have since focused on repairing and fortifying the bund to mitigate future floods
2. Gujarat: Heavy rains in August triggered flash floods, with around 49 fatalities and large-scale damage across multiple districts. Relief operations are ongoing as water levels gradually recede
3. Tripura: Severe flooding affected over 100,000 people, with casualties reaching 31. Relief camps were set up to aid those displaced by the disaster
4. Monsoon Intensity: The 2024 monsoon season recorded the highest number of heavy rainfall events in five years, largely attributed to climate change. Excess rainfall affected 158 districts, with more frequent short, intense rain spells driven by climate factors like El Niño and the Indian Ocean Dipole

These recent floods underscore the urgent need for better flood management and climate resilience across flood-prone areas.

Q 4. Make a list of inter-state water disputes.

Ans 4: Inter-state Water Disputes in India:

1. **The Krishna-Godavari Water Dispute:** This conflict arises over the allocation of water from the Krishna and Godavari rivers, primarily between the states of Maharashtra, Karnataka, Telangana, and Andhra Pradesh. The core issue is how the river water should be divided among these states, especially during times of drought, to meet agricultural and industrial demands.
2. **The Cauvery Water Dispute:** This long-standing issue involves Karnataka and Tamil Nadu, with Kerala and Puducherry also stakeholders. The dispute centers around the sharing of the Cauvery River's waters, with both Karnataka and Tamil Nadu seeking more control over the river's flow to support their agricultural needs.
3. **The Ravi-Beas Water Dispute:** This dispute involves Punjab, Haryana, and Rajasthan, centering on the allocation of water from the Ravi and Beas rivers. The conflict arises from each state's demand for a fair share of water to support its agricultural sector and local economy.

Activity

Q 5. Find out other rainwater harvesting systems existing in and around your locality.

Ans 5: Here are various methods for rainwater harvesting systems:

1. **Using Existing Wells:** Rooftop runoff can be directed into existing wells via pipes and a small sedimentation pit, which filters out pollutants. This not only conserves rainwater but also replenishes the groundwater levels locally.
2. **Percolation Pits:** Percolation pits are dug a short distance away from buildings and filled with materials like brick jelly or small stones, followed by a layer of river sand for enhanced percolation. The top sand layer needs to be cleaned or replaced every couple of years to remove accumulated silt, improving water infiltration.
3. **Decentralized Percolation Trenches:** Ideal for properties with larger open spaces, this method involves channeling rooftop runoff into soil or garden areas. A trench along the plot's perimeter, filled with pebbles and sand, can capture and store excess rainwater, gradually allowing it to percolate into the ground.

Additional Rainwater Utilization Techniques

- Runoff can be directed to structures near paved areas, parking lots, parks, and playgrounds for infiltration.
- Rainwater may also be stored in underground tanks for a few months, providing a supply for non-potable uses like washing, flushing, and various household needs.

Activity

Q. 6. Collect information on how industries are polluting our water resources.

Ans 6: Industries pollute water resources by releasing various harmful wastes, including:

1. **Industrial Sewage:** Wastewater containing pollutants from industrial processes, which can harm aquatic life and contaminate water supplies.
2. **Toxic Wastes from Leather Tanneries:** Leather tanning involves chemicals like chromium, which can be toxic if released untreated into water bodies.
3. **Chemicals, Solid Waste, and Polluted Water:** Industries discharge various hazardous chemicals, solid waste, and contaminated water, further degrading water quality and harming ecosystems.

Q. 7. Enact with your classmates a scene of water dispute in your locality.

Ans 7. Scene: Local Park During a Community Meeting

Characters:

- **Ayesha:** Concerned resident
- **Ravi:** Community leader
- **Mr. Singh:** Local farmer
- **Fatima:** Local shop owner

Ayesha: (raising her hand) We need to talk about the water shortages! The last few weeks, my family has barely had enough for cooking and cleaning.

Ravi: (nods) I understand, Ayesha. Mr. Singh, how are the water levels affecting your farm?

Mr. Singh: (frustrated) My crops are suffering! I can't afford to lose another season because of this.

Fatima: (chiming in) And what about us shop owners? Without water, we can't run our businesses. We all need a solution!

Ayesha: (looking around) We should work together! Maybe a schedule for water distribution could help everyone.

Ravi: (thoughtfully) That's a great idea, Ayesha. Let's form a committee to discuss a fair plan for everyone.

Mr. Singh: (relieved) Finally, a way to address this issue!

Fatima: (smiling) Together, we can solve this problem!

EXERCISES

1. Multiple choice questions

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(i) Based on the information given below, classify each of the situations as 'suffering from water scarcity' or 'not suffering from water scarcity'.

(a) Region with high annual rainfall.

Ans. Not suffering from water scarcity.

(b) Region having high annual rainfall and large population.

Ans. Suffering from water scarcity.

(c) Region having high annual rainfall but water is highly polluted.

Ans. Suffering from water scarcity.

(d) Region having low rainfall and low population.

Ans. Suffering from water scarcity.

(ii) Which one of the following statements is not an argument in favour of multipurpose river projects?

(a) Multipurpose projects bring water to those areas which suffer from water scarcity.

(b) Multipurpose projects by regulating water flow help to control floods.

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

(d) Multipurpose projects generate electricity for our industries and our homes.

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

(iii) Here are some false statements. Identify the mistakes and rewrite them correctly.

(a) Multiplying urban centres with large and dense populations and urban lifestyles have helped in proper utilization of water resources.

Ans (a): As urban centers continue to grow, they bring with them large, densely populated areas characterized by urban lifestyles. This expansion not only increases the demand for water and energy but also exacerbates existing challenges related to resource management.

(b) Regulating and damming of rivers do not affect the river's natural flow and its sediment flow.

Ans (b): The regulation and damming of rivers significantly impact their natural flow and sediment transport. By altering the river's course and flow rate, these interventions can disrupt the ecosystem and change sediment dynamics, affecting habitats and water quality downstream. Dams can trap sediment, leading to erosion upstream and sediment depletion downstream, which may harm aquatic life and alter the landscape.

(c) Today in Rajasthan, the practice of rooftop rainwater harvesting has gained popularity despite high water availability due to Indira Gandhi Canal.

Ans (c): Currently, the practice of rooftop rainwater harvesting in Rajasthan is declining, primarily because the Rajasthan Canal provides a continuous supply of water.

2. Answer the following questions in about 30 words.

(i) Explain how water becomes a renewable resource?

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Ans (i): Water is constantly renewed and replenished through the hydrological cycle, which describes the ongoing movement of water in its various states among the oceans, land, and atmosphere.

1. **Evaporation:** Water evaporates from the surface of oceans and other bodies of water due to the sun's heat, transforming into vapor.
2. **Condensation:** This vapor then condenses to form clouds.
3. **Precipitation:** Eventually, clouds release moisture as rain.

The rainwater that falls on land flows back into the oceans, completing the cycle and starting the process anew. Therefore, water is classified as a renewable resource.

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

Ans (ii): Water Scarcity:

Water scarcity occurs when there is not enough water available to meet the essential needs of individuals and communities, such as drinking and cooking.

Causes of Water Scarcity

1. **Over-exploitation of Water Resources:** Excessive withdrawal of water from sources, often exceeding the natural replenishment rate.
2. **Excessive Water Use:** Inefficient usage of water in agriculture, industry, and domestic settings can deplete available supplies.
3. **Inequitable Access:** Disparities in water distribution can lead to some populations having limited access to clean water.
4. **Growing Population:** An increasing population raises the demand for water, further straining existing resources.

(iii) Compare the advantages and disadvantages of multi-purpose river projects.

Ans (iii): Advantages and Disadvantages of Multipurpose River Projects:

Advantages

1. **Hydroelectric Power Generation:** Dams store water, creating a high-pressure flow that is used to generate hydroelectric power, a clean and renewable energy source.
2. **Flood Control:** By capturing excess rainfall in reservoirs, these projects can mitigate flooding and protect agricultural lands and infrastructure.
3. **Recreation and Tourism:** River valley projects often become popular tourist destinations, offering recreational activities such as boating, fishing, and hiking, which can boost local economies.

Disadvantages

1. **Impact on Aquatic Ecosystems:** Dams can disrupt natural river flow, making it challenging for fish and other aquatic species to migrate and reproduce.

2. **Displacement of Communities:** The construction of multipurpose projects often requires large areas of land, leading to the displacement of local populations, who may lose their homes and means of livelihood.

3. Answer the following questions in about 120 words.

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

Ans (ii): In arid and semi-arid regions, rainwater harvesting is often achieved through the use of tanks, known as 'tankas.' These systems are integrated into the architecture of homes, typically located in courtyards or within the house itself. They are connected to sloped roofs via pipes, allowing rainwater to flow directly into the underground storage tanks. Generally, the initial rainfall is not collected, as it serves to cleanse the rooftops and pipes. The harvested rainwater is stored in the tankas until the next rainfall, providing a dependable and sustainable source of drinking water. This method is crucial for water conservation in areas where water scarcity is a significant challenge.

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

Ans (ii):

(i) Traditionally, rainwater harvesting involved channeling water into underground tanks using open drains. However, modern practices now utilize PVC pipes to direct water to the sump or underground tank.

(ii) In the past, old, dry wells were relied upon to gather water, whereas today, artificial tanks are constructed specifically for water conservation.

(iii) Filtering rainwater was not a common practice previously, but contemporary methods now include the installation of filtration devices to purify the collected water.