Water Resources

Case Study Based Questions

Source 1

Read the source given below and answer the questions that follow by choosing the most appropriate option:

Given the abundance and renewability of water, it is difficult to imagine that we may suffer from water scarcity. The moment we speak of water shortages, we immediately associate it with regions having low rainfall or those that are drought prone. We instantaneously visualise the deserts of Rajasthan and women balancing many 'matkas' (earthen pots) used for collecting and storing water and travelling long distances to get water. True, the availability of water resources varies over space and time, mainly due to the variations in seasonal and annual precipitation, but water scarcity in most cases is caused by over-exploitation, excessive use and unequal access to water among different social groups. (CBSE SQP 2020)

Q1. What is the being discussed about in the given source?

a. Watershed management
b. Rainwater harvesting
c. Water scarcity
d. Integrated water resource management

Q2. What is the term 'water shortage' associates with?

a. Regions having low rainfall
b. Drought prone areas
c. Deserts of Rajasthan
d. All of the above

Q3. What is the reason for the variation in the availability of water resources over space and time?

a. Large and growing population
b. Variation in seasonal and annual precipitation
c. Over-exploitation
d. Falling ground water level

Q4. Which among the following is the reason for water scarcity?

a. Industrialisation

b. Urbanisation

c. Modernisation

d. All of these

Q5. Which of the following statements shows maximum intensity of water scarcity in India?

a. Groundwater is under serious threat.

b. About 300 districts have reported a water level decline.

c. Nearly one third of the country is overusing their groundwater reserves.

d. Groundwater overuse is particularly found in the agriculturally prosperous regions.

Q6. Two statements are marked as Assertion (A) and Reason (R). Read the statements and choose the correct option:

Assertion (A): Water resources are being over-exploited to expand irrigated area.

Reason (R): This helps to increase production of food grains.

a. Both Assertion (A) and Reason (R) are correct and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are correct, but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true, but Reason (R) is false.

d. Assertion (A) is false, but Reason (R) is true.

Answers

1. (c)
2. (d)
3. (b)
4. (d)
5. (b)
6. (a)

Source 2

Read the source given below and answer the questions that follow:

Irrigation has also changed the cropping pattern of many regions with farmers shifting to

water intensive and commercial crops. This has great ecological consequences like salinisation of the soil. At the same time, it has transformed the social landscape i.e., increasing the social gap between the richer landowners and the landless poor. As we can see, the dams did create conflicts between people wanting different uses and benefits from the same water resources. In Gujarat, the Sabarmati- basin farmers were agitated and almost caused a riot over the higher priority given to water supply in urban areas, particularly during droughts. Inter- state water disputes are also becoming common with regard to sharing the costs and benefits of the multi-purpose project.

Q1. How did irrigation change the cropping pattern in India?
Ans. Through irrigation facilities, farmers in many parts of India have shifted their cropping pattern to water intensive and commercial crops as can be seen in the states of Punjab and Haryana.

Q2. What was the cause of riot among the Sabarmati basin farmers in Gujarat?
Ans. In Gujarat, the Sabarmati basin farmers caused a riot over the higher priority given to water supply in urban areas particularly drought conditions.

Q3. What are inter-state water disputes? Why are such issues raised?
Ans. Inter-state water disputes are disagreements on the sharing of water and other resources of rivers and other water bodies among State Governments. Such disputes are raised due to unresolved problems regarding sharing of the costs and benefits of multi-purpose projects on these rivers.

Source 3

Read the source given below and answer the questions that follow:

RAINWATER HARVESTING

Many thought that given the disadvantages and rising resistance against the multi-purpose projects, water harvesting system was a viable alternative, both socio-economically and environmentally. In ancient India, along with the sophisticated hydraulic structures, there existed an extraordinary tradition of water harvesting system. People had in-depth knowledge of rainfall regimes and soil types and developed wide ranging techniques to harvest rainwater, groundwater, river water and flood water in keeping with the local ecological conditions and their water needs. In hill and mountainous regions, people built diversion channels like the 'guls' or 'kuls' of the

Western Himalayas for agriculture. 'Rooftop rainwater harvesting' was commonly practised to store drinking water, particularly in Rajasthan. In the flood plains of Bengal, people developed inundation channels to irrigate their fields. 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 like the 'Khadins' in Jaisalmer and Johads' in other parts of Rajasthan. (CBSE 2023)

Q1. Why is water harvesting system a viable alternative?

Ans. Rainwater harvesting is comparatively more economical, environmentally viable, and socially acceptable alternative, as compared to the construction of dams.

Q2. Describe the process of rooftop rainwater harvesting'?

Ans. Rooftop rainwater harvesting, is the technique through which rainwater is captured from the roof catchments and stored in reservoirs. Harvested rainwater can be stored in subsurface groundwater reservoir by adopting artificial recharge techniques to meet the household needs through storage in tanks.

Q3. Mention any two methods adopted by ancient India for water conservation.

Ans. Methods adopted by ancient India for water conservation are:
(i) Stepwells: Stepwells are examples of the many types of storages and irrigation tanks that were developed in India, mainly to cope with fluctuations in water availability.
(ii) Tanks: Rainwater tanks collect stormwater runoff from impervious surfaces such as roofs, reducing the amount that enters our water ways.

Source 4

Read the source given below and answer the questions that follow:

In ancient India, along with the sophisticated hydraulic structures, there existed an extraordinary tradition of water-harvesting system. People had an in-depth knowledge of rainfall regimes and soil types and developed wide ranging techniques to harvest groundwater, rainwater, river water and flood water in keeping with the local ecological conditions and their water needs. In hilly and mountainous regions, people built diversion channels like the 'kuls' and 'guls' of Western Himalayas for agriculture. Rooftop rainwater harvesting was very commonly practised to store drinking water, particularly in Rajasthan. (CBSE 2023)

Q1. Mention any two methods of traditional water-harvesting used in India.

Ans. The methods of traditional water-harvesting used in India are:

(i) Surface Runoff Harvesting.

(ii) Rooftop Rainwater Harvesting.

Q2. How do people of Rajasthan utilise rainwater?

Ans. Rajasthan people constructed underground tanks inside the house or in the courtyard. There was a pipe which is connected from the roofs and this helps in storing water to the tanks from the roofs.

Q3. Explain any two benefits of rainwater harvesting.

Ans. The two benefits of rainwater harvesting are:

(i) Promotes both water and energy conservation.

(ii) Improves the quality and quantity of ground water.

Source 5

Read the source given below and answer the questions that follow:

Maharashtra is a state located in Western India, with a population of over 110 million people. The state is home to several large cities, including Mumbai, and has a significant agricultural sector. However, the state is facing a severe water crisis, with its water resources coming under increasing pressure due to climate change, industrialisation and urbanisation. The main challenges faced by water resource management in Maharashtra are:

(i) Overexploitation of Groundwater:

Maharashtra is one of the most groundwater- stressed states in India, with the demand for water exceeding the supply. Overexploitation of groundwater for agriculture and urban use has led to a decline in water levels, which has severe implications for the sustainability of water resources.

(ii) Pollution of Surface Water: Industrialisation and urbanisation have led to the pollution of surface water bodies such as rivers and lakes. The pollution has led to water quality degradation, which poses risks to human health and the environment.

(iii) Inefficient Irrigation Practices: The

agricultural sector is the largest user of water in Maharashtra, accounting for around 80% of total water use. However, traditional irrigation practices such as flood irrigation are inefficient and lead to the wastage of water. (CBSE SQP 2023-24)

Q1. Mention any two reasons for the water crisis faced by the state of Maharashtra.

Ans. Reasons for the water crisis faced by the state of Maharashtra are:
(a) Overexploitation of groundwater.
(b) Pollution of surface water bodies due to industrialisation and urbanisation.

Q2. Despite being the second highest rainfall-receiving state of the country, Maharashtra still faces water crisis. Substantiate this statement in 40 words.

Ans. Despite receiving the second-highest rainfall in the country, traditional irrigation practises like flood irrigation leading to water shortages in Maharashtra. This is because flood irrigation involves excessive water use, and the water gets lost due to runoff, leading to less water available for other uses.

Q3. Propose any one solution to mitigate the water crisis faced by Maharashtra state.

Ans. Implementing rainwater harvesting systems in Maharashtra could be an effective solution to mitigate the water crisis by increasing the availability of water and reducing the pressure on existing water sources.