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Water Resources

& SCAN DONATE

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IMPORTANT TERMS

- **Dam:** Embankments or structures built across the river to store rainwater for various uses
- **Drip Irrigation:** A type of irrigation where water gets dropped in the form of drops near the roots of the plant mainly to conserve the moisture
- **Hydrological Cycle:** Continuous circulation of water between hydrosphere, atmosphere and lithosphere in which water changes its physical state
- **Inundation Canal:** Canal meant for diverting flood waters mainly during the rainy season
- **Irrigation:** Artificial means of supplying water to farmlands in the form of canalswellstubewells and tanks
- **Multi-purpose Projects:** River valley projects developed after independence for integrated development of water resources
- **Perennial Canal:** Canal diverted from perennial rivers
- **Rainwater Harvesting:** It is a technique developed to store the rainwaterriver water or groundwater to meet the needs of the population
- **River Water Disputed:** Disputes concerned with the sharing of river water between states flowing through several states in India

- **Surface Water:** Water flowing on the earth's surface in the form of rivers, streams, lakes, etc
- **Tank:** Natural or man-made reservoir to store rainwater
- **Water Scarcity:** Shortage of water due to natural or man-made activities

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MCQs

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1. Which one of the following statements is not an argument in favour of multi-purpose river projects?

(a) Multi-purpose projects bring water to those areas which suffer from water scarcity.

(b) Multi-purpose projects by regulating water flow help to control floods.

(c) Multi-purpose projects lead to large-scale displacements and loss of livelihood.

(d) Multi-purpose projects generate electricity for our industries and our homes.

2. Which is not a source of fresh water?

(a) Glaciers and ice sheets

(b) Groundwater

(c) Surface run off

(d) Oceans

3. According to Falkan Mark, water stress occurs when:

(a) water availability is less than 1000 cubic metre per person per day.

(b) there is no water scarcity.

(c) there is flood.

(d) water availability is more than 1000 cubic metre per person per day.

4. Which of the following are not causes of water scarcity?

(a) Growing population

(b) Growing of water intensive crop

(c) Expansion of irrigation facilities

(d) Individual wells and tubewells in farms

(e) Water harvesting technique

(f) Industries

(g) Roof top harvesting system

5. Bhakra Nangal River Valley Project is made on the river:

(a) Sutlej-Beas

(b) Ravi-Chenab

(c) Ganga

(d) Son

6. Hirakud Dam is constructed on the river:

(a) Ganga

(b) Manjira

(c) Manas

(d) Mahanadi

7. Water of Bhakra Nangal Project is being used mainly for:

(a) hydel power and irrigation

(b) fish breeding and navigation

(c) industrial use

(d) flood control

8. The diversion channels seen in the Western Himalayas are called:

(a) Guls or Kuls

(b) Khadins

(c) Johads

(d) Recharge pits

9. Agricultural fields which are used as rainfed storage structures are called:

(a) Kuls

(b) Khadins/Johads

(c) Recharge pits

(d) None of the above

10. Underground tanks seen in Rajasthan to store rainwater for drinking is called:

(a) Tankas

(b) Khadin

(c) Ponds

(d) Kuls

11. In Western Rajasthan today plenty of water is available due to:

(a) rooftop water harvesting

(b) perennial Rajasthan Canal

(c) construction of Tankas

(d) none of the above

12. Bamboo drip irrigation system is prevalent in:

(a) Manipur

(b) Meghalaya

(c) Mizoram

(d) Madhya Pradesh

13. The only State which has made rooftop rainwater harvesting structure compulsory to all the houses is:

(a) Andhra Pradesh

(b) Karnataka

(c) Tamil Nadu

(d) West Bengal

14. The remote village that has earned the rare distinction of being rich in rainwater?

(a) Gari

(b) Kaza

(c) Gendathur

(d) none of the above

15. Which one of the following is not an adverse effect of irrigation?

(a) Irrigation changes cropping pattern

(b) Water intensive crops are grown in dry areas

(c) Salinisation of soil

(d) Increases crop yield

16. Which of the following social movements is/ are not a resistance to multi-purpose projects?

(a) Narmada Bachao Andolan

(b) Tehri Dam Andolan

(c) Navdanya

(d) Chipko Movement

17. The freshwater is mainly obtained from surface runoff and groundwater that is continually being renewed and recharged through the _____.

(a) Sulfur cycle

(b) Rock cycle

(c) Hydrological cycle

(d) None of the above

18. 96.5 per cent of the total volume of the world's water is estimated to exist as _____ and only 2.5 per cent as _____.

(a) Freshwater, oceans

(b) Oceans, freshwater

(c) Groundwater, oceans

(d) None of the above

19. Nearly 70 per cent of freshwater occurs as ice sheets and glaciers in _____, Greenland and the mountainous regions of the world.

(a) Antarctica

(b) Siberia

(c) Alaska

(d) Russia

20. A little less than _____ of freshwater is stored as groundwater in the world's aquifers.

(a) 5%

(b) 20%

(c) 10%

(d) 30%

ANSWERS

1. c	4. e and g	7. a	10. a	13.c	16.c and d	19.a
2. d	5. a	8. a	11. b	14. c	17. c	20.d
3. a	6. d	9. b	12. b	15. d	18.b	

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Important Questions

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1. What is water scarcity? Write the main reasons for water scarcity.

Ans: Water scarcity means shortage of water. It is usually associated with regions having low rainfall or drought prone areas. There are many other reasons which lead to scarcity of water.

These are:

- **Large growing population— means more water required for domestic use and also to produce more food.**
- **In the agricultural sector, water resources are being over-exploited to expand irrigated areas and dry-season agriculture.**
- **More water required for irrigation purposes to facilitate higher food production, i.e., for doing multiple cropping and for HYV seeds.**
- **There is greater demand for water with growing urbanisation and industrialisation.**
- **An unequal access to water among different social groups.**
- **The quality of water is deteriorating, i.e., getting polluted by domestic and industrial wastes, chemical fertilizers and pesticides used in agriculture.**
- **Excessive use of water by industries which also require water to generate hydro-electric power to run them.**
- **Over exploitation of water in the urban areas. Housing societies and colonies have their own ground-water pumping devices. This causes depletion of fragile water resources in the cities.**

2. How intensive industrialisation and urbanisation have posed a great pressure on existing fresh water resources in India? Explain with two examples for each.

Answer: Intensive industrialisation and urbanisation have put greater pressure on existing fresh water resources. With the ever growing number of industries, the demand for water has grown tremendously:

- **Industries are heavy users of fresh water as water is required for cooling the machines as well as for the processing of goods. Also the machines run on the power supplied by the hydel power plants. 22 percent of the total electricity is hydro-electric power.**
- **Rapid urbanisation has led to expansion of industries which increased the requirement of water.**
- **The untreated industrial effluents which are discharged into water bodies are polluting the water and making it hazardous for human consumption. This is responsible for creating water scarcity.**

On the other hand, multiplying urban centres with:

- **Large urban populations and urban lifestyles have not only added to water and energy requirements but have further aggravated the problem by over-drawing the groundwater by using their own groundwater pumping devices for meeting their water needs for domestic purposes such as cleaning, cooking, washing, etc.**
- **Thus, water resources are being over-exploited which has caused their depletion in several cities.**

3. Write the adverse effects of over-exploitation of ground water resources.

Ans: Pumping out more water from under the ground may lead to falling ground water levels. It will adversely affect water availability. This, in turn, will affect our agriculture and food security of the people. Impoverishment of water resources may adversely affect the ecological cycle.

4. Write the main causes of water pollution.

Ans: Water gets polluted by:

- **Domestic wastes, especially urban sewers.**
- **Industrial wastes are disposed off in the water without proper treatment**
- **Chemical effluents from industries and from agricultural sector.**
- **Pesticides and fertilisers used in agriculture may get washed into rivers by rain-water and may pollute the water by enriching it with minerals.**
- **Many human activities, e.g., religious rituals and immersing of idols, etc. in the water also pollute water.**

5. What is the need for conservation of water resources?

Ans: Our water resources are limited and our requirements are increasing day by day. The water resources are unevenly distributed. Most of our resources especially in the cities and urban areas are polluted and unsuitable for drinking and other purposes. To safeguard ourselves from health hazards. We need to conserve water for the continuation of our livelihoods and to prevent degradation of our natural ecosystem. To ensure food security and for continuation of our livelihoods.For productive activities of the nation. To prevent degradation of our natural ecosystem.

6. Write some measures adopted for conservation of water resources.

Ans: Measures for water conservation:

- **Do not overdraw the ground water, recharge the ground water by techniques like rainwater harvesting.**
- **Avoid wastage of water at all levels.**
- **Do not pollute the water.**
- **Increasing the water resources by tapping the rainwater in reservoirs, watershed development programmes, etc.**
- **Adopting water conserving techniques of irrigation, e.g., drip irrigation and sprinklers etc., especially in dry areas. Sufficient water percolation facilities should be increased to help in raising the level of the water table.**

7.What were the different types of hydraulic structures constructed in Ancient India? Give examples.

Ans: The different types of hydraulic structures were:

- **Dams built of stone rubble e.g., during Chandragupta Maurya' s time, dams, lakes and irrigation systems were extensively built.**
- **Reservoirs or lakes like the Bhopal lake of the 11th century which was one of the largest artificial lakes of its time.**
- **Embankments and canals for irrigation. Sophisticated irrigation works have been found in Kalinga (Orissa), Kolhapur (Maharashtra), Nagarjunakonda (Andhra Pradesh) etc.**

- Many tanks were built to store rainwater e.g., the tank in Huaz Khas in Delhi was built in 14th century to supply water to Siri Fort area.

8. How was water conserved in ancient India? Give any four examples in support of your answer.

Ans: Archaeological and historical records show that from ancient times India has been constructing sophisticated hydraulic structures like dams, reservoirs, embankments and canals for irrigation.

For example, in the first century B.C., Allahabad had sophisticated water harvesting system channelling the flood water of the river Ganga.

- During the time of Chandragupta Maurya, dams, lakes and irrigation systems were extensively built.
- Sophisticated irrigation works have been found in Kalinga in Odisha, Nagarjunakonda in Andhra Pradesh, Bennur in Karnataka and Kolhapur in Maharashtra.
- Bhopal lake, built in the 11th century, was one of the largest artificial lakes of its time.
- In the 14th century, Iltutmish constructed a tank in Hauz Khas, Delhi for supplying water in Siri Fort area.

9.What is a dam? Describe the functioning of dams? On what basis are dams classified into different types?

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

A dam is the reservoir and not the whole structure.

Functioning:

- **Most dams have a section called spillway or weir over which or through which, water will flow intermittently or continuously.**

Classification:

- **Dams are classified according to structure, intended purpose or height.**
- **According to structure and materials used, they are classified as timber dams, embankment dams or masonry dams.**
- **According to height, they are classified as large and major dams, low dams, medium height dams and high dams.**

10. What is the main difference between traditional dams and modern dams?

Answer: Traditionally dams were built to impound rivers and rainwater that could be used later to irrigate the agricultural fields.

Today, dams are referred to as multipurpose projects where many uses of the impounded water are integrated with one another. The main purposes served by these projects are irrigation, electricity generation, flood control, water supply for domestic and industrial use, fish breeding and tourism.

11. Why are multipurpose river valley projects called 'The Temples of Modern India'? Who first made this statement?

Or

Jawahar Lai Nehru proudly proclaimed the 'dams as the temples of modern India'. Analyze this statement.

Ans: Jawahar Lai Nehru proclaimed that multipurpose projects are ' The Temples of Modern India' , because they were thought of as the vehicle

that would lead the nation to development and progress. He believed that these projects with their integrated water resource management approach would integrate development of agriculture and the village economy with rapid industrialisation and growth of the urban economy.

Dams or multipurpose river valley projects have the following advantages:

- They bring water to those areas which suffer from water scarcity and also provide water for irrigation.
- These projects generate electricity for industries and our homes.
- They help in controlling floods by regulating the water flow.
- These projects can be used for recreation, inland navigation and fish breeding.

12. 'Construction of dams on rivers has caused environmental degradation.' Give reasons to support this statement.

Ans: Damming of rivers affects their natural flow causing poor sediment flow.

- Excessive sedimentation at the bottom of the reservoir.
- Lack of sediments results in rockier stream bed and poorer habitat for the rivers aquatic life.
- Dams also fragment rivers, making it difficult for acquatic fauna to migrate, especially for spawning.
- The reservoirs submerge the existing vegetation and soil, leading to its decomposition over time.

- **Flood plains are deprived of silt and khadar, affecting the fertility levels of the soil.**
- **Construction of dams also faces resistance because of large scale displacement of local communities.**

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Case based Questions

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Read the source given below and answer the following questions:

Passage 1

Today, dams are built not just for irrigation but for electricity generation, water supply for domestic and industrial uses, flood control, recreation, inland navigation and fish breeding. Hence, dams are now referred to as multi-purpose projects where the many uses of the impounded water are integrated with one another. For example, in the Sutlu-Beas river basin, the Bhakra - Nangal project water is being used both for hydel power production and irrigationSimilarly, the Hirakud project in the Mahanadi basin integrates conservation of water with flood controlMulti-purpose projects, launched after Independence with their integrated water resources management approachwere thought of as the vehicle that would lead the nation to development and progress, overcoming the handicap of its colonial pastJawaharlal Nehru proudly proclaimed the dams as the temples of modern India'the reason being that it would integrate development of agriculture and the village economy with rapid industrialisation and growth of the urban economy

Answer the following MCQs by choosing the most appropriate option

(i) Which of the following multipurpose projects is found in the Satluj-Beas river basin?

(a) Hirakud project

(b) Damodar Valley Corporation

(c) Bhakra Nangal Project

(d) Rihand Project

(ii) Hirakund dam is built on which river?

(a) Chenab

(b) Mahanadi

(c) Krishna

(d) Satluj

(iii) For which of the following purposes were dams traditionally built?

(a) For generating electricity

(b) For supplying water to industries

(c) For Flood control

(d) To Impound river and rain water for irrigation

(iv) Which one of the following is not an adverse effect of dams?

(a) Interstate water disputes

(b) Excessive sedimentation of Reservoir

(c) Displacement of population

(d) Flood control

PASSAGE 2

Many thought that given the disadvantages and rising resistance against the multipurpose projectswater 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 regionspeople built diversion channels like the gulsor kulsof the Western Himalayas for agricultureRooftop rainwater harvesting was commonly practised to store drinking waterparticularly in RajasthanIn the flood plains of Bengalpeople developed inundation channels to irrigate their fields. In and 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 khadinsin Jaisalmer and Johadsin other parts of Rajasthan. In the semi-arid and and regions of Rajasthanparticularly in Bikaner, Phalodi and Barmer, almost all the houses traditionally had underground tanks or tankas for storing drinking water

(i) Agricultural fields which are used as rainfed storage structures are called:

(a) Kuls

(b) Khadins/Johads

(c) Recharge pits

(d) None of the above

(ii) In which of the following regions, people built 'Gulsand 'Kulsfor irrigation?

(a) Northern Plains

(b) Western Himalayas

(c) Coastal areas

(d) None of these

(iii) The diversion channels seen in the Western Himalayas are called:

(a) Gulsor Kuls

(b) Khadins

(c) Johads

(d) Recharge pits

(iv) Underground tanks seen in Rajasthan to store rainwater for drinking is called

(a) Tankas

(b) Khadis

(c) Ponds

(d) Kuls

ANSWERS

Passage 1

i. c

ii. b

iii. d

iv. d

Passage 2

i. a

ii. b

iii. a

iv. a

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MAP QUESTIONS

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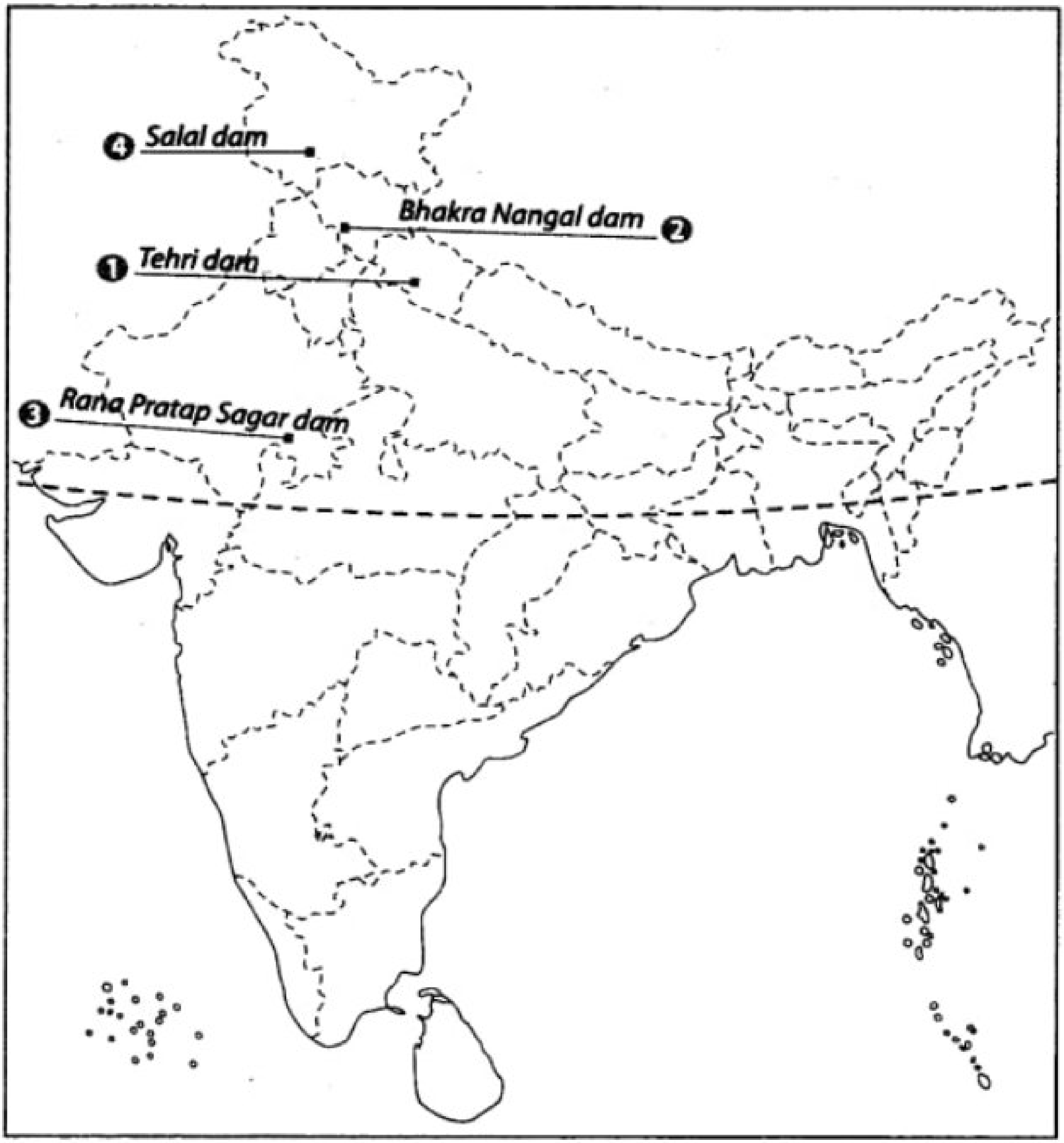
Questions 1: Locate and label the following items on the given map with appropriate symbols.

1Tehri dam [CBSE 2012, 11, 10]
2. Bhakra Nangal Dam
3. Rana Pratap Sagar dam [CBSE 2012, 11, 10]
4. Salal dam [CBSE 2012, 11]

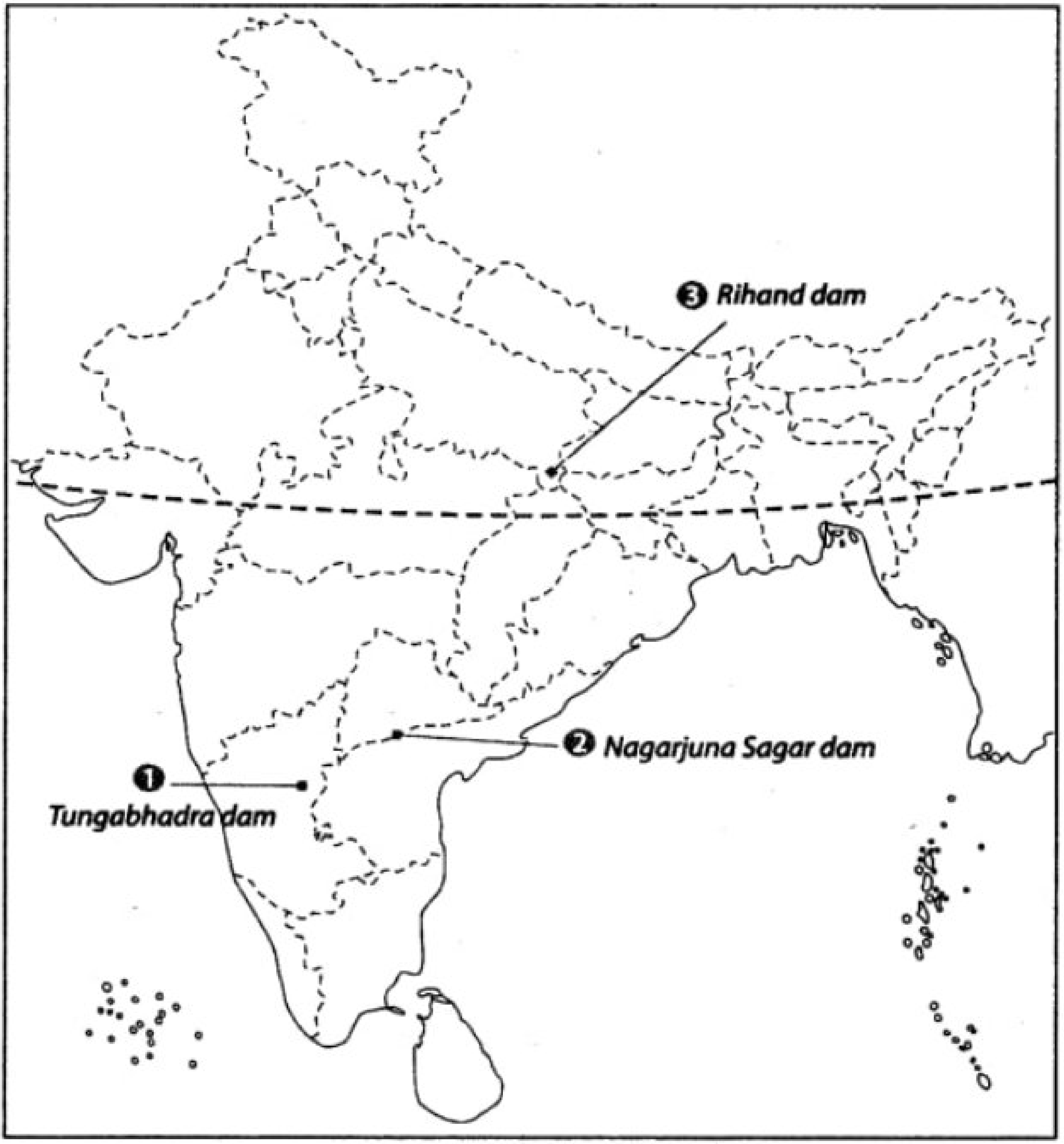
Ans:



Questions 2: Features are marked by numbers in the given outline map of India. Identify these features with the help of the following information and write their correct on the lines marked in the map

1. A dam constructed across the Tungabhadra river [CBSE 2012, 11, 10]
2. Adam [CBSE 2016, 11, 10]
3. A concrete gravity dam

Ans:



Questions 3: Locate and label the following items on the given map with appropriate symbols.

1. Tapi river
2. Mettur dam
3. Kaveri river
4. Koyna Dam

Ans: