

अभ्यास | CLASS 10TH

SOCIAL SCIENCE

GEOGRAPHY | WATER RESOURCES

Crafted with love 

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Water Resources**Water scarcity → Cause**

Need for water conservation 🤔

Multipurpose river project

- Meaning (Dam)
- Ancient hydraulic structure
- Positive V/S Negative

Rain water harvesting

- Various types and rooftop rainwater harvesting

Water scarcity

➡ Unavailability of water due to the variations in seasonal and annual precipitations.

↓
Causes 🤔

- Over-exploitation, excessive use and unequal access to water, Population growth, Wastage of fresh drinking water, Intensive industrialisation and urbanisation, Agriculture as one of the major exploiter of groundwater.
- Areas receiving heavy rainfall also face water shortage (**qualitative Scarcity**).

Solution 🤔 ➡

- Government of India by announcing the **Jal Jeevan Mission (JJM)**.
- Enable every rural household get assured supply of potable piped water(55 litres per capita per day)
- **Atal Bhujal Yojana (Atal Jal)** : Objective is to bring in behavioural changes in the community, from the prevailing attitude of consumption to conservation and smart water management in water stressed districts.
- **Pradhan Mantri Krishi Sinchayee Yojana** : Enhance the physical access of water on the farm and expand cultivable area under assured irrigation (har khet ko pani)

Need for water conservation and management.

➡ Conservation is essential to safeguard ourselves from health hazards, ensure food security, of our livelihoods and prevent degradation of our natural ecosystems.

Hydraulic structures in ancient India



Sophisticated water harvesting system at sringaverapura near Allahabad, dams and lakes built during Chandragupta Maurya, irrigation works in Kalinga, Nagarjunakonda, Bennur and Kolhapur, Bhopal lake and Hauz Khas.

Dams and multipurpose river projects

Meaning and type

- A dam is a barrier across flowing water that obstructs, directs or retards the flow, often creating a reservoir. This reservoir is called dam. This structure has a section called spillway or weir through which water flows.
- Dams are classified according to structure, intended purpose or height.

Positives 🤔

Negatives 🤔

Positive

- MPP serves variety of purposes such as irrigation, electricity generation flood control, fish breeding, inland navigation etc.
- Integrated water resource management approach for the development of both rural and urban area.
- “Temples of modern India”- J.L. Nehru

Multipurpose Projects

Negative

- They fragment river streams, cause floods, earthquakes, and landslides and displace hundred thousands people.
- They cause excessive sedimentation and harm the aquatic life of the water body.
- Dams have also caused salinisation of soil and changed cropping pattern, leading to increased social and economic gaps.
- It triggers floods, caused soil erosion, water-borne diseases, pests, and pollution.

Rainwater Harvesting



The collection, saving, and storage of rainwater for future use or times of crisis.

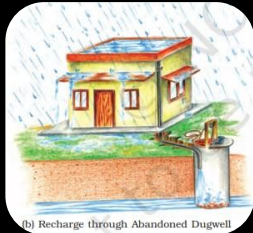


Traditional rainwater harvesting system



- *Guls or kuls* in hill and mountainous.
- Inundation channels in the flood plains of Bengal.
- Rooftop rainwater in the flood plains in Rajasthan.
- *Khadins and Johads* in parts of Rajasthan.
- Underground *tankas* were built in Barmer and Bikaner.
- Bamboo drip irrigation system in Meghalaya.

Rooftop rainwater harvesting 🤔



Common techniques for water conservation are construction of percolation pits, digging and refilling of dug wells and trenches, roof water collected in the tanks below the ground and on the rooftops.

Though it is on the decline in western Rajasthan, rooftop rainwater harvesting is gaining popularity in other states like Shillong, **Karnataka(Gendathur)** and **Tamil Nadu (made compulsory in this state by law)**.

Water Scarcity : The shortage of water; an imbalance between the demand and supply of water, also good quality of water. Water scarcity is the shortage of water, but it is not only associated with regions having low rainfall or those that are drought-prone. It also has a qualitative aspect.

Jal Jeevan Mission : It is an initiative launched by government in 2019, the main objective of this mission is to ensure the supply of 55 litres of water per person per day to every rural household through Functional Household Tap Connections (FHTC) by 2024.

Multipurpose river Projects : A dam built across a river often serves more than one purpose at a time and is termed as a multipurpose project. These projects are planned for various purposes like irrigation, hydropower generation, water supply for drinking and industrial purposes, flood control, and navigation.

Dam : It is a barrier across flowing water that obstructs, directs or retards the flow, typically creating a reservoir, lake, or impoundment. The main purpose of dams is that they facilitate the conservation of water.

Narmada Bachao Andolan: It is an Indian social movement initiated and mobilised by tribal people, farmers, environmentalists and human rights activists against the Sardar Sarovar Dam, being built across the Narmada river in Gujarat. It focused on the environmental issues and aims to rehabilitate displaced people.

Rain Water Harvesting: It is a method that involves the collection and storage of rainwater for further use. Water harvesting system is a viable alternative, both socio-economically and environmentally. People had in-depth knowledge of rainfall regimes and soil types and developed wide-ranging techniques to harvest rainwater for future use.

Guls or Kuls: In hilly and mountainous regions, people built diversion channels to collect rainwater, spring water and store in circular tanks called 'guls' or 'kuls'.

Khadins and Johads: In arid and semi-arid regions, agricultural fields were converted into rainfed storage structures. These allowed the rain water to stand and moisten the soil.

Rooftop Rainwater Harvesting : Rooftop rainwater harvesting is a technique used for the conservation of water. In this technique, the rainwater that has fallen on the roof of houses or buildings is collected in storage or underground tanks through the help of pipes. This also helps us recharge the groundwater levels.

Bamboo Drip Irrigation System: This system is in practice for 200 years in Meghalaya. In this system, water from streams and springs in the hills get transported to agricultural fields by using bamboo as pipes.

Atal Bhujal Yojana: The Atal Bhujal Yojana is being implemented in 8,220 water-stressed villages across 229 blocks in 80 districts in seven states. These states account for 37% of India's water-stressed areas. The scheme focuses on promoting water conservation and better water management through community behavior change.

Pradhan Mantri Krishi Sinchae Yojana : The Pradhan Mantri Krishi Sinchayee Yojana is a program aimed at enhancing water access for farms, expanding irrigated land, improving water use efficiency, promoting water-saving technologies, and encouraging sustainable water conservation practices to increase crop yield and reduce wastage.

Which one of the following is the irrigation system in Meghalaya ?

CBSE Board Paper 2024 - Set [32/3/1]

a. To irrigate land only during rainy season.

b. To use large volumes of water for irrigation.

c. To remove water from soil.

d. To use bamboo drip irrigation system.

Explain the qualitative aspects of water scarcity?



Water pollution affects the quality of water available. That is the qualitative aspect of water scarcity.

Overexploitation of water resources, reduces the quality of available water and causes unequal access of water among different social groups.

Water quality is degrading due to pollution from domestic trash, industrial waste, pesticides, and fertilisers used in agriculture, making it unsafe for human consumption.

Why did Jawaharlal Nehru proclaim the dams as the "temples of modern India"? Explain any three reasons.



Jawaharlal Nehru proclaimed the dams as the “temples of modern India” because it will integrate development of agriculture and the village economy with rapid industrialisation and growth of the urban economy:

- (i) They eliminate or reduce flooding.
- (ii) Provide water for agriculture.
- (iii) Provide water for human and industrial consumption.
- (iv) Provide hydroelectricity for houses and industries.

Describe any three different rainwater harvesting systems practised in India.



- (i) In hilly and mountainous regions, people build diversion channels like 'gul' or 'kul' in Western Himalaya for agriculture.
- (ii) Roof-top rainwater harvesting integrated with tanks was commonly practised to store drinking water particularly in Rajasthan and Gujarat.
- (iii) In West Bengal, people develop inundation channels to irrigate their fields.
- (iv) In semi-arid regions agricultural fields are converted into rain-fed storage structures that allowed the water to stand and moist the soil known as Khadins and Johads.

How has urbanisation posed a threat to A existing fresh water resources in India?



- Urban areas are densely populated.
- Housing societies and buildings have their own pumping devices to draw groundwater.
- Depletion of fresh water resources and over exploitation of groundwater.
- Urbanisation have aggravated the problem of water scarcity.
- Any other relevant point (**open-ended question**)

Describe the working of the rooftop rainwater harvesting technique.



- The rainwater falling on the roof is collected through a PVC pipe and filtered using sand and bricks.
- Then, it is collected in the sump for immediate use.
- Excess water from the transferred to a well, which recharges the sump groundwater.
- Any further requirement of water can be taken from the well.



What is water scarcity and what are its main causes?



The shortage of water; an imbalance between the demand and supply of water, also good quality of water, is referred to as water scarcity.

Causes of water scarcity are :

- I. The availability of water resources varies over space and time, mainly due to the variations in seasonal and annual precipitation.
- II. In agricultural sector to facilitate higher food-grain production, water resources are being over-exploited.
- III. Overuse of water resources due to rapid industrialisation and urbanisation.
- IV. Scarcity due to the bad quality of water.(Pollution)

Ancient hydraulic structures Describe the hydraulic structures made in ancient india?



- (i) In the first century BCE, Sringeripura near Allahabad had a sophisticated water harvesting system which could channel the flood water of river Ganga.**
- (ii) During his reign Chandragupta Maurya, constructed many lakes, dams and irrigation systems.**
- (iii) Sophisticated irrigation works are also found in Kalinga (Odisha), Kolhapur (Maharashtra), Nagarjunakonda (Andhra Pradesh), Bennur (Karnataka), etc.**
- (iv) One of the largest artificial lake was built in Bhopal in the 11th century.**
- (v) In the 14th century, Iltutmish constructed the tank in Hauz Khas, Delhi to supply water to the Siri Fort area.**

State the importance of multi-purpose projects.



Some of the main functions of the multipurpose projects are:

- I. **Electricity Generation:** Dams generate hydroelectric power, providing a renewable source of energy.
- II. **Water Supply:** They supply water for domestic and industrial needs, ensuring availability for daily activities and economic growth.
- III. **Flood Control:** Dams help in controlling floods by regulating water flow and storing excess water during heavy rains.
- IV. **Recreation:** Reservoirs created by dams offer recreational opportunities such as boating and tourism.
- V. **Inland Navigation:** Dams facilitate inland water transport by creating navigable water routes.
- VI. **Fish Breeding:** The water bodies formed by dams promote fish breeding, benefiting the fishing industry.

In recent years, multipurpose projects and large dams have come under great scrutiny and opposition. Explain why?

In recent years, multipurpose projects and large dams have come under great scrutiny and opposition for a variety of reasons.

- (i) Regulating and damming of rivers affect their natural flow.**
- (ii) River's diversion and barricading due to building of dams impact migration and spawning of aquatic life.**
- (iii) The dams have triggered floods due to sedimentation in the reservoir and release of excess water during heavy rains.**
- (iv) Large scale displacement of local communities, local people who give up their land for the projects hardly receive any benefit.**
- (v) Sometime multipurpose projects induced earthquakes, caused water borne-diseases and pests, and led to pollution resulting from excessive use of water.**

CBSE Board Paper 2019 - Set [32/2/1]

How has Shillong solved the problem of acute shortage of water?

1

CBSE Board Paper 2019 - Set [32/2/1]

How has Tamil Nadu solved the problem of acute shortage of water?

1

CBSE Board Paper 2019 - Set [32/1/1]

"Water scarcity may be an outcome of large and growing population in India." Analyse the statement. 3

CBSE Board Paper 2019 - Set [32/5/1]

"Urbanisation has added to water scarcity." Support the statement with arguments. 3

CBSE Board Paper 2019 - Set [32/2/1]

"The dams that were constructed to control floods have triggered floods." Analyse the statement. 3

CBSE Board Paper 2019 - Set [32/4/1]

"Multi-purpose projects and large dams have been the cause of many new social movements." Highlight the concerns related to such movements. 3

CBSE Board Paper 2019 - Set [32/4/1]

"Traditional harvesting system is a useful system to conserve and store water." Highlight the importance of this system with two examples. 3

CBSE Board Paper 2019 - Set [32/5/1]

"Water harvesting system is an effective measure to reduce the problem of water scarcity." Justify the statement. 3

CBSE Board Paper 2023 - Set [32/1/1]

In which of the following States Tungabhadra Dam is located?

1

- (A) Tamil Nadu
- (B) Kerala
- (C) Andhra Pradesh
- (D) Karnataka

CBSE Board Paper 2023 - Set [32/2/1]

Read the given source and answer the questions that follow :

3

Most of the objections to the projects arose due to their failure to achieve the purposes for which they were built. Ironically, the dams that were constructed to control the floods have triggered floods due to sedimentation in the reservoir. Moreover, the big dams have mostly been unsuccessful in controlling floods at the time of excessive rainfall. You may have seen or read how the release of water from the dams during heavy rains aggravated the flood situation in Maharashtra and Gujarat in 2006. The floods have not only devastated life and property but also caused extensive soil erosion. Sedimentation also meant that the flood plains were deprived of silt, a natural fertiliser, further adding on to the problem of land degradation. It was also observed that the multi-purpose projects induced earthquakes, caused water-borne diseases and pests and pollution resulting from excessive use of water.

- (1) Name the movement against the river project in Gujarat.
- (2) How have the big dams mostly been unsuccessful in controlling floods at the time of excessive rainfall
- (3) Analyse any two merits of multi-purpose river projects.

CBSE Board Paper 2023 - Set [32/5/1]

Read the given source and answer the questions that follow :

3

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.

- (1) Mention any two methods of traditional water-harvesting used in India.
- (2) How do people of Rajasthan utilise rainwater?
- (3) Explain any two benefits of rainwater harvesting.

CBSE Board Paper 32/4/1 (2023)

Read the sources 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 rainfed storage structures that allowed the water to stand and moisten the soil like the 'khadins' in Jaisalmer and 'Johads' in other parts of Rajasthan.

- (I) Why is water harvesting system a viable alternative? 1
- (II) Describe the process of 'rooftop rainwater harvesting'. 1
- (III) Mention any two methods adopted by ancient India for water conservation.

Match Column I with Column II and choose the correct option.

Column I

(Dams)

i. Sardar Sarovar

ii. Hirakud

iii. Bhakra Nangal

iv. Nagarjuna Sagar

Options:

(A) i-a, ii-b, iii-c, iv-d

(B) i-b, ii-a, iii-d, iv-c

(C) i-c, ii-d, iii-b, iv-a

(D). i-c, ii-d, iii-a, iv-b

Column II

(Rivers)

a. Sutlej

b. Krishna

c. Narmada

d. Mahanadi

In which one of the following states is bamboo drip irrigation system' prevalent?

1

(A) Tamil Nadu

(B) West Bengal

(C) Meghalaya

(D) Odisha



CBSE Board Paper 2024 - Set [32/5/1]

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- (II) Describe the process of 'rooftop rainwater harvesting.'
- (III) Mention any two methods adopted by ancient India for water conservation.

CBSE Board Paper 2024 - Set [32/1/1]

Read the following source carefully and answer the questions that follow:

3

FLOODS

Basic safety Precautions To Be Taken: Listen to radio/TV for the latest weather bulletins and flood warnings. Pass on the information to others.

Make a family emergency kit which should include; a portable radio/transistor, torch, spare batteries, a first-aid box along with essential medicines, ORS, dry food items, drinking water, matchboxes, candles and other essential items. Keep hurricane lamp, ropes, rubb in your house. These could be useful.

Keep your cash, jewellery, valuables, important documents etc. in a safe place. If there is a flood, move along with your family members and cattle to safe areas like relief camps, evacuation centers, elevated grounds Turn off power and gas connections before leaving your house. where you can take shelter.

CBSE Board Paper 2024 - Set [32/1/1]

During floods:

Don't enter into flood waters; it could be dangerous.

Don't allow children to play in or near flood waters.

Stay away from sewerage line, gutters, drains, culverts etc.

Be careful of snakes; snakebites are common during floods.

Stay away from electric poles and fallen power-lines to avoid electrocution.

Don't use wet electrical appliances-get them checked before use.

Eat freshly cooked and dry food. Always keep your food covered. Use boiled and filtered drinking water.

Keep all drains, gutters near your house clean.

Stagnation of water can breed vector/water-borne diseases. In case of sickness, seek medical assistance.

Use bleaching powder and lime to disinfect the surroundings.

Mention any two essential items that should be included in a 'family emergency kit.'

Why are the items of family emergency kit important during flood situation?

In case of a flood, what are the recommended actions to ensure the safety of your family and belongings? Describe any two.

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KEEP LEARNING

TOGETHER
WE CAN

