

Class-X Ch-3 [Geography] * Water Resources

Introduction

- $\frac{3}{4}$ of Earth Surface is covered with water [But only a small part is usable] ??
- usable part : * Surface Run off * Groundwater

 - Renewed by Hydrological Cycle.
- Q. Then why water is scarce ?? 😰?
- 96.5% of total volume of water is in oceans and only 2.5% is fresh water.
- 70% fresh water occurs as ice sheet and glaciers.
- India receives nearly 4% of global precipitation and ranks 133 in terms of water availability person per annum.
- Total renewable water Resources of India are estimated at 1897 sq/km per annum.
- By 2025, large part will face absolute water scarcity.

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• Water Scarcity - I

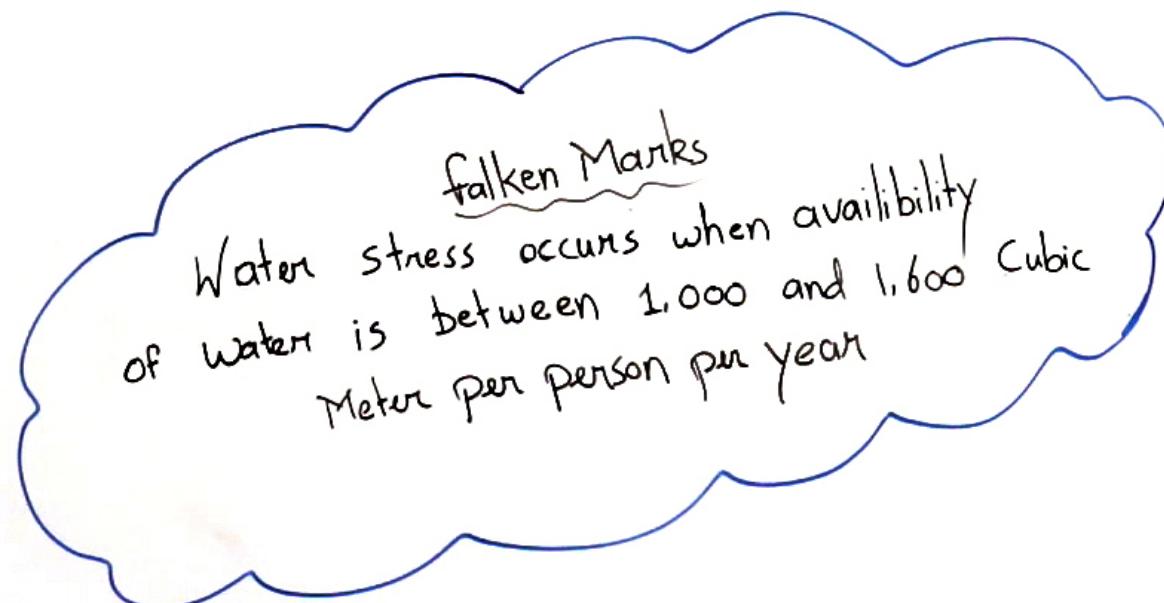
→ Abundance and Renewability of water \Rightarrow How Can it be Scarce??

We think =

- It May be in areas of desert and drought affected regions. [x]

• Caused Mainly due to

→ over exploitation, excessive use and unequal access to water among different group.



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• Water Scarcity = II

→ quantitative aspect



• Exploitation of water Resources and falling ground water levels.

* 22% of electricity required is produced by Hydroelectric plant.

Polluted due to Domestic and Industrial wastes, chemicals Pesticide and fertilisers used. Hazardous for Human use

→ qualitative aspect

↓
quantity is sufficient but area still suffer from water scarcity ??

↓
Due to Bad quality of water

↓
Polluted due to Domestic and Industrial wastes, chemicals Pesticide and fertilisers used. Hazardous for Human use

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Need for Water Conservation and Management

- To safeguard ourselves from :
 - Health hazards [qualitative aspect]
 - Ensure food security [growing population]
 - Degradation of natural ecosystem
 - Water Scarcity will degrade natural resources and Cause Ecological Crisis, affecting our lives negatively.

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• Multi Purpose River Project and Integrated Water Resources Management - I

→ How do we Conserve and Manage ??

• Historical and Archaeological records of water Conservation :

- (i). First century B.C Sringaverapura had Sophisticated water harvesting System channelling flood water of river ganga.
- (ii). Dams, lakes and irrigation System were Extensively built during chandragupta maurya.
- (iii). Evidences of Sophisticated irrigation works have also been found in kalinga (orissa), Nagarjunakonda (A.P) Bernum (Karnataka), Kolhapur (Maharashtra)
- (iv). In the 11th Century, Bhopal lake one of the largest artificial lakes of its time was built
- (v). In 14th Century , the tank in Haug khas, Delhi was Constructed by Iltutmish for supplying water to Siri fort area.

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• Multi-purpose River Project and Integrated Water Resource Management.

→ Dam = It is a barrier across flowing water that obstructs, directs or retards the flow of water, often creating a reservoir lake or impoundments.

- Based on structure ex: Timber dam
- Based on Heights ex: Small scale

→ Why MPP ??

- Irrigation
- Electricity generation
- Flood Control
- Recreation
- Inland navigation
- Fish breeding

“Temples of Modern India”

- J. L Nehru

- Development of agriculture and village economy.
- Rapid Industrialisation and growth of urban economy.

= Integrated use of Impounded water

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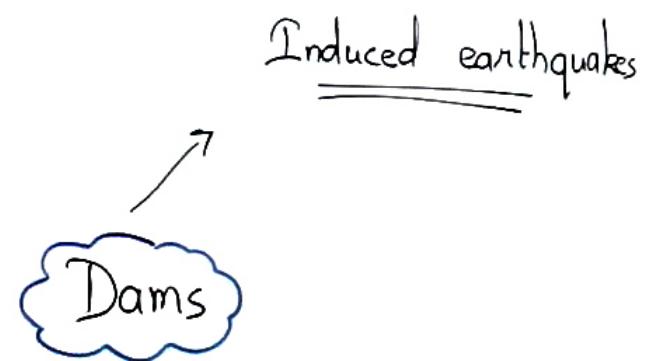
• Opposition of Multipurpose projects - I

→ Geographical Reason

- Regulating or damming rivers affect natural flows.
- Excessive Sedimentation at the bottom.

Resulting rockier stream beds

- Poorer habitats for aquatic life,
Submergence of existing vegetation
and Soil.



- Unsuccessful in controlling floods at the time of rainfall.

Ex: Release of water from dams

- Destruction of property, Soil erosion and land degradation caused water borne diseases, and pests.

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• Opposition of Multipurpose projects - II

→ Social Impact

• Large Scale Displacement unfair share of sacrifice

• Irrigation → changed Cropping pattern

• Salinisation of Soil

• Transformed Social landscape
→ [Gap among Rich and Poor ↑]

• Social Movement against MPP's,

"Narmada Bachao Andolan" and "Tehri Dam Andolan".

• Same water Resources
different use. ?? 😐??

→ Agitation by farmers in
Gujrat, Sabarmati basin.
over water supply priority
given to urban areas.

→ Inter State water
dispute.

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• Rain water Harvesting

- Economically and Environmentally viable alternative in Period of resistance against MPP.
- Variation in water harvesting System, keeping the local ecological Conditions and their Water needs in Mind.

(i). Guls and kuls

- In montanious region of western Himalayas
- Impoundment on hill tops.

(iv). Inundation channels in flood plains of Bengal.

(v). Roof top Rain water Harvesting.

(ii). Khadins and Johads

- Jaisalmer and Rajasthan
- In arid area agricultural field were converted into Rain fed storage structures

(iii). Bamboo drip irrigation System

- In Meghalaya, 200 year old System of using bamboo pipe to transport water.
- 18-20 liters of water enters the bamboo pipes and 20-80 drop reaches at the site of plants.

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• Rooftop Rain water Harvesting

→ In arid and semi-arid area of Rajasthan [Bikaner, Phalodi]



• Had Tankas [underground]



• Connected with Rooftop Rainwater Harvesting.



• Through pipes water is transported to tankas.

- ① Reliable Source of Drinking water.
- ② Beat the Summer Heat.

Tanka System



Grindathur Model

→ In Mysore Karnataka 200 Household have installed Rooftop Rain water Harvesting System.

→ 1,000 mm annual precipitation with 80% collection efficiency, 5000 liters of water is collected by every household annually.

- * Tamil Nadu is the first state having Compulsory legal provision for Rooftop rain water harvesting.

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Frequently asked Questions

- (i). Water Scarcity ? Causes of it ? Specific Cause ? Need for Conservation and Management of water resources?
- (ii) Ancient water resource management System ?
- (iii). what is Dam? Why it is known MPP ? Advantages of it ?
- (iv). Reasons for opposition of MPP's ? Problems arised due to MPP's ? [specific]
- (v). Various Methods of Rain water harvesting ?
- (vi). Rooftop rainwater harvesting ? Girndathun model ?
- (vii). Define : Dam, Guls and kuls , Khadin and Johads, Bamboo drip irrigation etc