

Class	X	Subject	Geography
Prd	1	Chapter	CHAPTER-3: WATER RESOURCES (Theoretical part to be Assessed only in Periodic Tests)
Sub-Concepts	Water Scarcity and The Need for Water Conservation and Management		
Teaching Aid To be used	PPT (Audio-Visual) , India: River Map		
Learning Outcome	<ol style="list-style-type: none"> 1. Students will demonstrate an understanding of the hydrology and the role water has in landscape-forming processes that act on the Earth's surface. 2. Students will be able to describe the processes of and importance of groundwater flow and aquifer systems. 3. Students will be able to compare interactions that occur in various settings and their importance to water resources. 4. Students will be able to describe water scarcity and water stress. 5. Students will be able to describe the interactions between water systems and ecosystems. 		
Sl. No	Step Wise (What to be done)		
1.Introduction	<p>Teacher will begin the session while asking importance of Water and discussing facts on water availability.</p> <p>Three-fourth of the earth's surface is covered with water but only a small proportion of it accounts for freshwater that can be put to use. Water is a renewable resource.</p>		
2 WATER SCARCITY	<p>Water Scarcity: Define and impact, Reasons</p> <ul style="list-style-type: none"> • Over-exploitation, excessive use and unequal access to water among different social groups. • Water resources are being over-exploited to expand irrigated areas for dry-season agriculture. • water scarcity due to bad quality of water. 		

3 NEED	<p><i>The Need for Water Conservation and Management</i></p> <ul style="list-style-type: none"> To safeguard ourselves from health hazards. To ensure food security, continuation of our livelihoods and productive activities. To prevent degradation of our natural ecosystems.
4.Home Assignment	<ol style="list-style-type: none"> Define water scarcity? Mention reasons of increasing water scarcity? What is water stress? You grow up in a city of Gujarat and have witnessed many changes. Mention some of the reasons you find for decrease in the water sources.



ODM Teachers' Note

Class	X	Subject	Geography
Prd	2	Chapter	CHAPTER-3: WATER RESOURCES (Theoretical part to be Assessed only in Periodic Tests)
Sub-Concepts	Multi-Purpose River Projects and Integrated Water Resources Management		
Teaching Aid To be used	PPT (Audio-Visual) , Video, India: River Map		
Learning Outcome	<p>Students will demonstrate an understanding of the multi-purpose river projects and integrated water resource management.</p> <p>Students will be able to describe the processes and importance of water management.</p> <p>Students will analyse positive and negative impact of dams.</p>		
Sl. No	Step Wise (What to be done)		

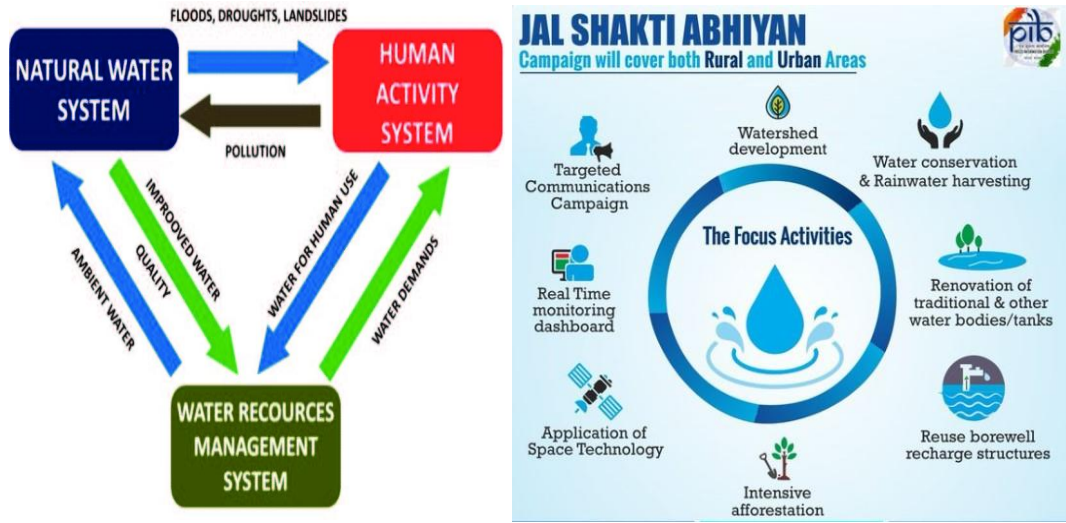
<p>Recapitulation</p>	<p>Teacher will ask following question to check understanding of previous concepts: -</p> <p>How is fresh water obtained?</p> <p>What is Hydrological cycle?</p> <p>What cause water longing (scarcity) in most places?</p> <p>What is water scarcity?</p>
<p>1 Hydraulic Structures</p>	<div data-bbox="381 688 1360 1052" data-label="Image"> </div> <p>Video explaining water conservation and efforts since ancient India: - https://www.youtube.com/watch?v=ZMhvzMcOCjI</p>
<p>2</p>	<p>Multi-Purpose River Projects: Pros and Cons</p> <div data-bbox="350 1367 1406 1793" data-label="Image"> </div>
<p>3</p>	<p>Teacher will explain various efforts taken up by our government towards</p>

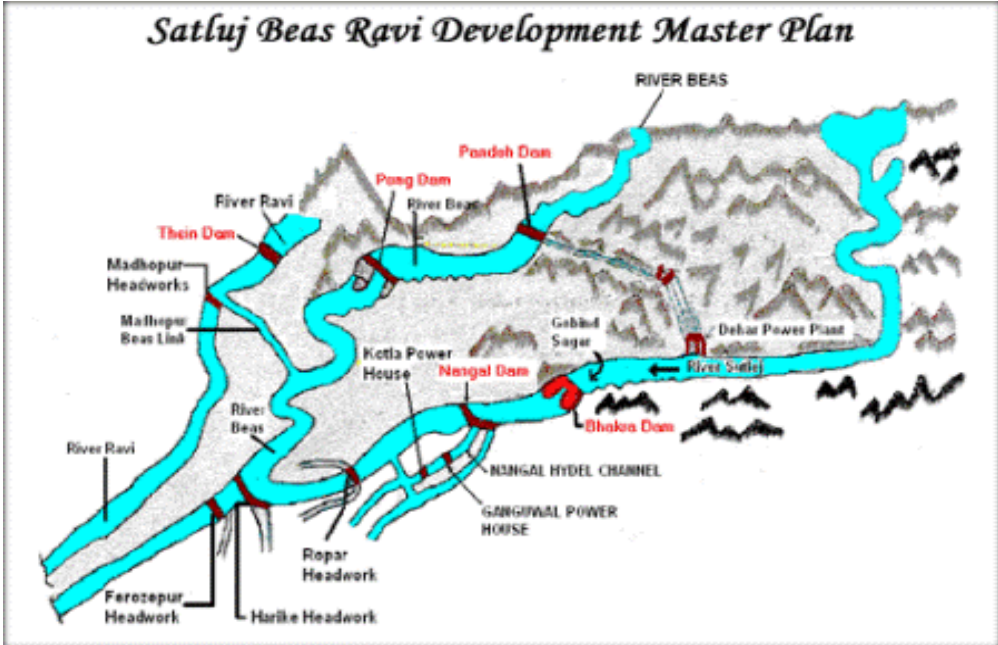
construction multi-purpose river valley projects.



4

Integrated Water Resources Management



<p>5</p>	<p><i>Dams</i> <i>Uses of Dam</i> <i>Side effects of Creating Dams</i></p>  <p>The map, titled "Satluj Beas Ravi Development Master Plan", illustrates the river systems and associated infrastructure. Key features include: <ul style="list-style-type: none"> Dams: Thin Dam, Pong Dam, Pandoh Dam, Nangal Dam, and Bhakra Dam. Power Houses: Kotla Power House, Dehar Power Plant, and Gangawal Power House. Headworks: Madhopur, Ropar, Ferozepur, and Harike. Other Infrastructure: Malhuja Beas Link, Gobind Sagar, and Nangal Hydel Channel. Rivers: River Ravi, River Beas, and River Sutlej. </p>
<p>6</p>	<p>Most of the objections to the projects arose due to their failure to achieve the purposes for which they were built. Most of the dams were constructed to control floods but, these dams have triggered floods. Dams have also caused extensive soil erosion. Excessive use of water has resulted in earthquakes, caused water-borne diseases and pests and pollution.</p>
<p>7Home Assignment ent</p>	<ol style="list-style-type: none"> 1. Name hydraulic structures of ancient India. 2. What is multi-purpose river valley project? Give Example. 3. Mention merits and demerits of constructing dams. 4. Name any 5 dam and the river they are built over in India

Class	X	Subject	Geography
Prd	3	Chapter	CHAPTER-3: WATER RESOURCES (Theoretical part to be Assessed only in Periodic Tests)
Sub-Concepts	Rainwater Harvesting		
Teaching Aid To be used	Smart Board, PPT(Audio-Visual) , India: River Map		
Learning Outcome	<p>Students will demonstrate an understanding of the hydrology and the role water has in landscape-forming processes that act on the Earth's surface.</p> <p>Students will be able to describe the processes of rain water harvesting.</p> <p>Students will be able to compare interactions that occur in various settings and their importance to water resources.</p>		
Sl. No	Step Wise (What to be done)		
Recapitulation	<p>Teacher will ask following question to check understanding of previous concepts: -</p> <p>What is the objectives of Multipurpose River Valley Projects? Give examples?</p> <p>Why are dams referred to as multipurpose projects?</p> <p>What are the advantages of dams?</p>		
1	Teacher will explain process of Rain Water Harvesting		



2

Teacher will explain different methods that have been adopted in different areas for Rain Water Harvesting in our country :-

In hill and mountainous regions, people built diversion channels like the '**guls**' or '**kuls**' of the Western Himalayas for agriculture.



3

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 such as '**khadins**' in Jaisalmer and '**Johads**' in other parts of Rajasthan.



4

The **tankas** are part of the well-developed rooftop rainwater harvesting system.



5

Tamil Nadu is the first state in India which has made rooftop rainwater harvesting structure compulsory to all the houses across the state. There are legal provisions to punish the defaulters.

6.Home
Assignm
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1. Explain rain water harvesting with diagram.
2. Mention some of the examples of rain water harvesting followed in local areas of India.

Class	X	Subject	Geography
Prd	4	Chapter	CHAPTER-3: WATER RESOURCES (Theoretical part to be Assessed only in Periodic Tests)
Sub-Concepts	Map Practice (to be evaluated in Board Examination)		
Teaching Aid To be used	Smart Board (Audio-Visual) , India: River Map		
Learning Outcome	<p>Students will be demonstrated map plotting, location and labelling for Dams of India.</p> <p>Students will be able to identify major multi-purpose river valley projects, dams and locate them individually.</p> <p>Students will be able to compare structures of dams, their exact location and its impact on the people.</p>		
Sl. No	Step Wise (What to be done)		
Recapitulation	<p>Teacher will ask following question to check understanding of previous concepts: -</p> <p>Which water is recharged by roof-top rainwater harvesting technique?</p> <p>Name the diversion channels of western Himalayas?</p> <p>Name two rainwater harvesting structure built in Jaisalmer.</p> <p>Name two rainwater harvesting structures built in Rajasthan?</p>		
1	<u>IMPORTANT FOR MAPSKILL EVALUATION</u>		

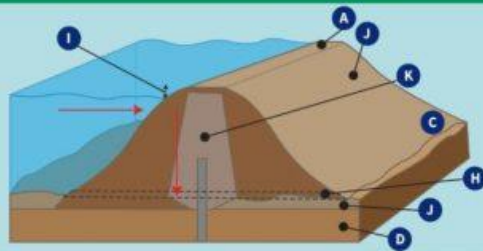
- Dams: a. Salal
 b. Bhakra Nangal
 c. Tehri
 d. Rana Pratap Sagar
 e. Sardar Sarovar
 f. Hirakud
 g. Nagarjuna Sagar
 h. Tungabhadra

2



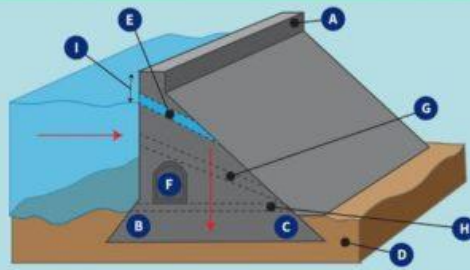
3

<i>River</i>	<i>Dams constructed</i>	<i>State/place</i>
Mahanadi	Hirakud Dam	Odisha
Satluj	Bhakhra Nangal Dam	Himachal Pradesh in northern India
Krishna	Nagarjuna Sagar Dam	Nalgonda District, Telangana State.
Chenab	Salal Dam*	Jammu and Kashmir.
Narmada	Sardar Project* Sarovar	Gujarat
Bhagirathi	Tehri Dam	Uttarakhand
Ganges	Naraura dam	Uttar Pradesh
Chambal River	Rana Pratap Sagar Dam	Rajasthan
Chambal	Gandhi Sagar Dam	Madhya Pradesh



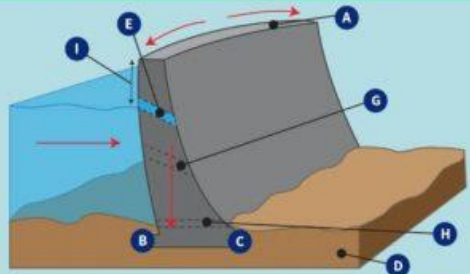
EMBANKMENT

- Constructed from compacted soil ("earthfill") or rock ("rockfill") with an impervious core
- Designed to transfer the entire water load downward
- 80% of all large dams in the U.S. are embankment dams
- Used to retain water across wide river valleys or for flood control
- Typically shorter and wider than other types of dams



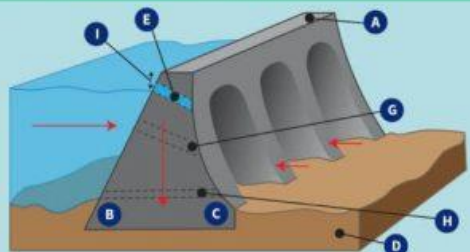
GRAVITY

- Constructed of concrete or stone masonry
- Designed to transfer the entire water load downward
- Typically span narrow river valleys with bedrock abutments and foundations
- Retain water by utilizing the weight of the dam to resist the horizontal water load pushing against it
- Each section of the dam is independently stable



ARCH

- Constructed of concrete
- Designed to transfer water loads to the adjacent rock formations
- Constructed only in canyons with solid rock walls that are able to resist the pressure of the dam
- Because the canyon walls bear the bulk of the load, arch dams are thinly constructed, requiring less material than other types of dams



BUTTRESS

- Constructed of reinforced concrete
- Designed to transfer the water load both downward and to the buttresses
- Hollow gravity dams with a solid upstream face and a buttressed downstream side
- Buttresses are supports that transmit the water force to a bedrock foundation

A Crest: The top of the dam, in some cases used to provide a roadway or walkway over the dam

B Heel: The part of the dam in contact with ground on the upstream side

C Toe: The part of the dam in contact with the ground on the downstream side

D Foundation: Excavated surface or undisturbed material

E Spillway: Structure that provides for controlled conveyance of water flows downstream of the dam

F Gallery: Small room within large dams used to monitor the performance of the dam, with a drain on the floor for water seepage

G Outlet: Also called sluiceway, used to release water from the reservoir for water supply, irrigation, and hydro power

H Blowoff: Opening within the dam near the base to drain the reservoir

I Freeboard: Vertical distance between the spillway level and the crest of the dam

J Pervious Material: Substances that allow water to pass through

K Impervious Material: Substances that do not allow water to pass through

Dams: a. Salal b. Bhakra Nangal c. Tehri d. Rana Pratap Sagar

e. Sardar Sarovar f. Hirakud g. Nagarjuna Sagar h. Tungabhadra

6.Home Assignm ent	<ol style="list-style-type: none">1. On which river the Sardar Sarovar Dam built?2. Name any two river valley projects or dams which have led to social movements.3. Practice Map skill: Dams of India<ul style="list-style-type: none">• <i>Dam on river Narmada</i>• <i>Tehri Dam</i>• <i>Sardar Sarovar dam</i>• <i>Rana Pratap Sagar Dam</i>• <i>Bhakhra Nangal Project</i>• <i>Hirakud Dam</i>
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