

# Our Water Resources

Lesson No.	Title	Activity
21	Our Water Resources	Identify the rivers which will be linked under river linking programme.

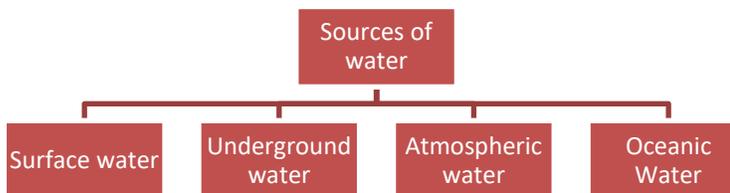
## Meaning

The evolution of life took place from water. The amount of water found in the living beings is 65 percent and 65 to 99 percent in plants. It is a Precious gift of nature. Earth is called a watery planet. Availability of water varies from place to place. The same is with potable water and it is limited. Deterioration of quality of water is another challenge.

## Water Resources

- Water is a renewable and inexhaustible resource.
- The increasing demand causing problem.
- India has 4% water while housing 16% population of the world.
- It ranks 1<sup>st</sup> in worlds irrigated area.
- Growing population require larger quantity of food grains increasing requirements of irrigated areas.
- Demand of water increased due to urbanisation, industrialisation and modernisation

## Sources of Water



### Surface Water

- Source of surface water is Precipitation.
- 20% precipitation evaporated and some part absorbed as ground water.
- Large part is found in rivers, ponds, lakes etc and remaining flows in to the sea.
- Water found on surface is called 'surface water'
- Two third of total surface water is available in 3 rivers- Indus, Ganga and Brahmaputra.
- Water storage capacity of reservoirs is 17400 billion cubic meter.
- River- Indus, Ganga, Brahmaputra, Godawari, Krishna, Kaveri, Mahanadi, Narmada, Son etc
- Storage capacity of usable water is maximum in Ganga basin in spite of maximum rainfall in Brahmaputra basin. Storage capacity of Godawari, Krishna, Kaveri is sufficient

## Underground Water

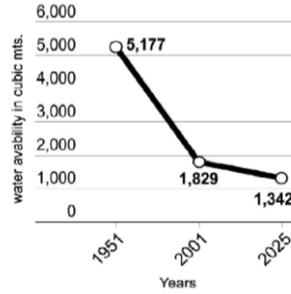
- Source of surface water is Rainwater collected underground in large amount.
- As estimated underground water capacity of India is more than 4310 billion cubic meter.
- It's unevenly distributed depending upon rainfall, nature of lands and its slope specifically found in more concentration in high rainfall area, plains and porous rocks.
- Large resources in Ganga-Brahmaputra plains and Coastal plains while less in peninsular plateaus, Himalayan regions and deserts.
- Highly used in less comparatively rainfall areas i.e. Punjab, Haryana, Rajasthan, UP and Tamilnadu.

## Water Budget

- The balance between available water and water under use in country is water budget.
  - Great variation in water resources
  - The unit of measurement is cubic meter or hectare meter
  - Water standing one meter deep in perfect level areas of one square meter/one hectare
  - 90% rainfall in 3 months
  - Variation of rainy days
  - Western Ghats - 137 days, Rajasthan - less than 10
  - Variation in nature of rainfall
  - Causing great variation in distribution
  - Percent of areas receiving rainfall- 8% - 200 cm, 20%- 125-200 cm, 42%- 75-125 cm, remaining 30%- less than 75 cm
  - Uneven rainfall - Imbalanced water budget

## Utility of Water

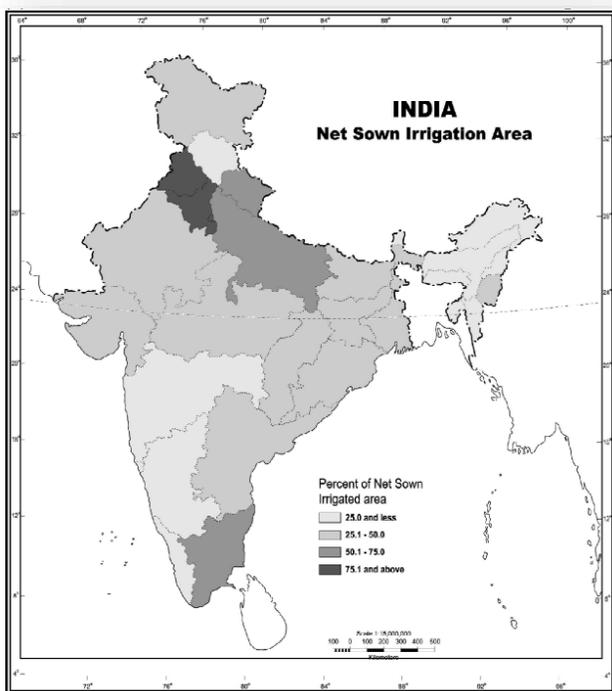
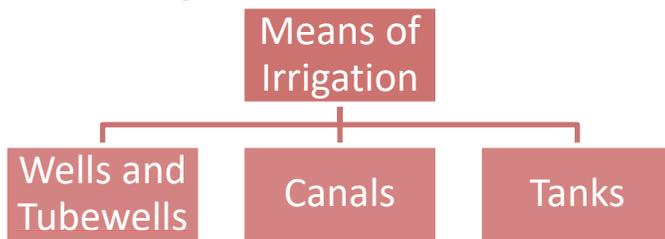
- Increase in population – Increase in demand
- Demand increased for drinking, irrigation and industries
- Water crisis arises when per capita availability falls below 1000 cubic meter
- Water utilised for drinking, domestic use, irrigation, industries, public health, cleanliness, draining sewages Generation of hydro-electricity, fishing, forestry, water sports etc.
- Changing pattern of water-



Use	1990	2000	2010*	2025*	2050*
Domestic	25	33	42	52	60
Irrigation	460	536	653	770	800
Industry	15	30	79	120	130
Energy	19	27	44	71	120
Others	30	33	35	37	40
<b>Total</b>	<b>549</b>	<b>659</b>	<b>853</b>	<b>1050</b>	<b>1150</b>

\* Estimated

## Means of Irrigation



## River Valley Projects

- After the independence special emphasis was laid on the development of river valley projects.
- River valley projects were multipurpose projects.
- The main objectives of these projects are flood control, prevention of soil erosion, provision of water for irrigation, drinking and for industries, generation of electricity, transport, entertainment, conservation of wild life and development of fisheries.
- Main River Valley Projects of India-

Name of the Project	River	Constructed dam/reservoir	Beneficiary states
1	2	3	4
1. Damodar Valley	Damodar	Dams:- 1. Tilaiya 2. Konar 3. Maitlhon 4. Panchet hill	1. Jharkhand 2. W. Bengal
2. Bhakra Nangal	Satluj	1. Bhakra 2. Nangal 3. Pong Reservoir – Gobind sagar	1. Punjab 2. Himachal 3. Haryana 4. Delhi
3. Hirakud	Mahanadi	1. Hirakud 2. Tikkarpara 3. Naraj	1. Madhya Pradesh 2. Orissa 3. Chhattisgarh
4. Tungbhadra	Tungbhadra	Canals with dams Tungbhadra dam	1. Karnataka 2. Andhra Pradesh
5. Nagarjuna Sagar	Krishna	Nagarjuna Sagar Dam	Andhra Pradesh
6. Narmada Valley	Narmada	Proposed dams  1. Sardar Sarovar 2. Narmada Sagar 3. Burgi	1. Madhya Pradesh 2. Maharashtra  3. Gujarat 4. Rajasthan
7. Kosi	Kosi	Three units – 1. Kosi Barrage 2. Kosi Shaktigrah 3. Hanuman Nagar	1. Bihar 2. Jharkhand 3. Nepal
8. Chambal Valley	Chambal	Dams:- 1. Gandhi Sagar 2. Rana Pratap Sagar 3. Jawahar Sagar 4. Kota Barrage	1. Rajasthan 2. Madhya Pradesh
9. Indira Gandhi Canal	Beas-Satluj	Dam on Ravi Beas and Satluj Pong	Rajasthan

## Rain Water Harvesting

- Rain water harvesting means collection of rain water.
- Its special meaning is a technique of recharging of underground water.

### Urban Scenario

- Total amount of rain water recovered in an area is called 'rain water reserve'.
- Effective management of rain water reserve is called 'potential water harvesting'.
- If the area of the roof of house is 100 square metres and the 'average rainfall' of this area is 60 cms. Suppose the water on the roof has neither flowed, percolated nor evaporated then there will be 60 cms, high water on the roof.

### Rural Scenario

- The tradition of water harvesting is very old in India.
- Deepening and dredging of wells, tanks and ponds and water harvesting in the small channels (locally known as bawli) are included in these methods.

### Methods of Rain Water Harvesting

#### Construction of Potholes

- Water harvesting is done through small ditches constructed in the areas of less underground water.
- These ditches may be constructed 1-2 metre wide and 2-3 metres deep.
- These ditches are filled with pebbles and sand to percolate rainwater.

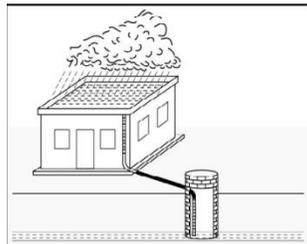
#### Construction of Trenches

- In the lower regions where porous rocks are found after making trenches of 0.5 to 1 metre width, 1 to 1.5 metre depth and 10 to 15 metre length, these are filled with pebbles.
- These trenches should be made parallel to the slope of the land.



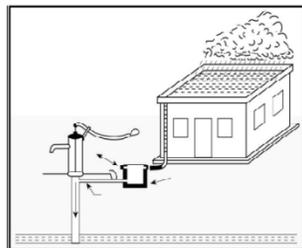
#### Use of wells

- The wells which have become dry and are not being used at present can be used for water harvesting.



#### Handpump

- Stored rainwater can be made underground with the help of filter by running handpumps in the areas of lack of underground water.



### National Water Policy

- 'National Water Policy' was formulated and accepted in September 1987. It was revised in 2002 and presented as 'National Water Policy' 2002.
- The problems of floods and drought require thinking at the national level. Several problems arise in planning and working on water resources.

### Watershed Development

- The meaning of watershed refers to an area whose water flows towards a point. The planned use of this water can deliver better results.
- Related area may be a village or a group of villages in the form of a unit. All kinds of land like agricultural, waste lands and forests may be included in this area.
- The overall development with proper utilization of water in the area is considered to be watershed development.

#### Benefits of Watershed Development

- Supply of water for drinking and irrigation.
- Increase in bio-diversity.
- Loss of acidity in the soil
- Increase in the agricultural production and productivity.
- Decrease in the cutting of forests.
- Increase in standard of living and employment.

### River linkages

- Large areas of the country suffer from droughts and floods.
- 'National water Development Authority' was constituted in 1982 to solve this problem.
- The main objectives of its constitution were to identify only the national water network. Finally National water Development Authority identified linkage of 30 rivers. Large rivers have mainly been included in this programme.

#### Benefits River linkages

- All round development of an area is possible by joining basins.
- The irrigation of additional agricultural area
- Availability of underground water
- Additional hydro-electricity
- Flood control, water transport, water supply, fishing, removal of acidity from the soil and control on water pollution

### Methods of Water Conservation

- Construction of Dams and reservoirs
- Control of pollution by urban waste.
- Water should be used properly.
- Mass awakening & active participation of the people

### Evaluate Yourself

1. Explain the changing pattern of water utility in India.
2. Suggest any ways of rain water harvesting with the help of illustration.
3. Do you think rivers linkages are beneficial? Support your views with appropriate examples.