Our Water Resources: Objectives, Water Resources, Sources of Water

- In the evolution of all kinds of life, water has played an important role. The amount of water found in the living beings is 65% and $65-99\%$ in plants. This clearly shows the need and utility of water. Water is a precious gift of the nature and has several uses. Water is very essential for the development. From the point of view of availability and suitability, the potable water is limited in India. Another disturbing issue is day by day deteriorating quality of water.
- It is a matter of great concern for all of us. Besides coordinating the demand and supply of the water, there is a need to keep the balance among different sources of water. Hence conservation of water resources is an essential requirement.

Objectives

The major objectives of this chapter are:

- To know about different sources of water
- To explain the meaning of water budget
- To explain the uneven distribution of water
- To know the utility of water
- To understand the utility and distribution of different sources of irrigation
- To know about the important river valley projects
- To explain the need of the water management
- To explain the meaning of watershed development
- To explain the methods of conservation of water resources

Water Resources

Water is renewable and inexhaustible resource but is in trouble these days. Demand of water has been increasing continuously and its supply is decreasing. If we look at the water resources of India in the global context, India has 4% water whereas she is housing 16% of the world's population. It means the per capita availability of water is quite low in our country. India ranks first in the world in terms of total irrigated area. $1/8^{th}$ area of the country is flood prone and $1/6^{th}$ area is under the grip of drought. The nature of monsoon is mostly responsible for this. Food grains and other agricultural products are required in large quantity for the growing population. For this reason, the use of water for irrigation of crops has been increasing. The demand for water has increased in the cities due to rapid urbanization, industrialization, and modernization. In addition, the demand for water has been increasing for sewerage and for removing all kinds of wastes.

Sources of Water

There are four main sources of water- surface water, underground water, atmospheric water, and oceanic water. In our daily life we use only surface water and underground water.

Surface Water

- The main source of surface water is precipitation. About 20% part of the precipitation evaporates and mixes with the environment. A part of the running water goes underground. The large part of surface water is found in rivers, rivulets, ponds, and lakes. Remaining water flows into the seas and oceans. Water found on the surface is called surface water.
- About $2/3^{rd}$ of the total surface water flows into three major rivers of the country – Indus, Ganges and Brahmaputra. The water storage capacity of reservoirs constructed in India so far is about 17400 billion cubic metres. At the time of independence, the water storage capacity was only 180 billion cubic metres. Hence water storage capacity has increased about ten times.

India: Distribution of Surface and Underground Water According to River Basins

(Figures in billion Cubic metre)

Sl. No.	River Basin	Surface Water Flow		Underground Water	
		Annual Flow	Usable Capacity	Renewable	Usable Capacity
1.	Indus	71.3	46.0	26.5	24.3
2.	Ganga	525.0	250.0	171.0	157.0
3.	Brahmaputra	629.0	24.0	27.0	24.0
4.	Godavari	110.5	76.3	40.7	37.0
5.	Krishna	70.0	58.0	26.4	24.0
6.	Kaveri	21.4	19.0	12.3	11.3
7.	Mahanadi	68.9	50.0	16.5	15.0
8.	Narmada	45.7	34.5	10.8	9.9
9.	Tapti	14.9	14.5	8.3	7.6
10.	Other rivers	365.4	11.82	74.0	68.2
Total		**1952.1**	**690.3**	**431.32**	**395.6**

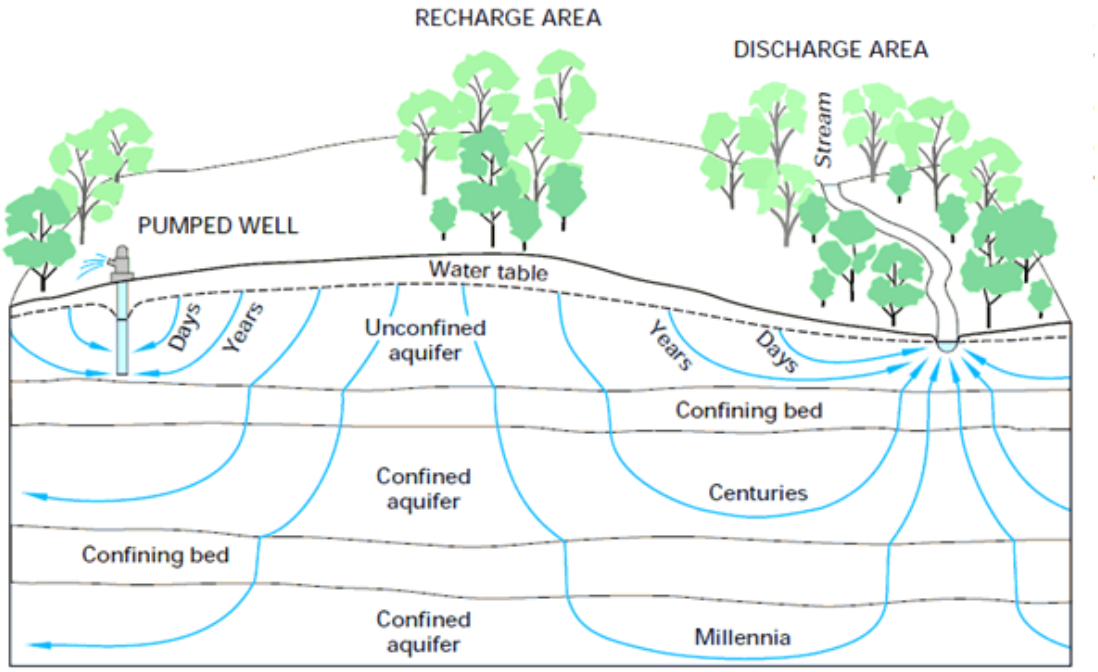
Table of Dist. Of Surface

The storage capacity of usable water in the Ganges basin is the maximum. But in spite of maximum annual flow, the storage capacity of usable water is the least in the Brahmaputra basin. The storage capacity in Godavari, Krishna, Mahanadi and Indus are sufficient. If storage capacity of usable water is seen in terms of ratio, then Tapti river basin is 97% . Annual water flow in the three major rivers

of India- Indus, Ganga and Brahmaputra is more. Hence water storage capacity of these rivers can be increased.

Underground Water

Rainwater percolates into the earth's surface and becomes underground water. The process of percolation also take place from the surface water. Large amount of water gets collected under the earth's surface by these two methods. This is called underground water. According to the Central Underground Water Board, renewable underground water capacity in India (1994 - 95) was about 4310 billion cubic metre per year. Out of this about 3960 billion cubic metre water is available for use.



The distribution of undergrounds water is not the same everywhere. Availability of underground water depends upon the amount of rainfall, nature of rainfall, nature of land, and its slope. In the areas of high rainfall where the land is almost plain and has porous rocks, the water easily

percolates there. Therefore, underground water is available in plenty at shallow depths in these areas. In the areas like Rajasthan where the land is plain and has porous sandy soil, the underground water is available in lesser amount at greater depths due to lack of rainfall. In the north-eastern areas of the country, where the land is sloppy, the conditions are not suitable for percolation of water in spite of more rainfall. With the result underground water is available in less quantity at greater depths in these areas also. There are large resources of underground water in the plains of Ganga-Brahmaputra and in coastal plains. The availability of underground water is less in peninsular plateau, Himalayan region, and desert areas.

Use of Underground Water Capacity

Underground water is used on a large scale in the areas where the rainfall is comparatively less. Underground water is used on a large scale in Punjab, Haryana, Rajasthan, Tamil Nadu, Gujarat, and Uttar Pradesh whereas Andhra Pradesh, Madhya Pradesh, Maharashtra, Karnataka, and Chhattisgarh are such states where in spite of less rainfall, the use of underground water is less. There is a great need to develop underground water resources here.