

‘There is water hence there is a life.’ Any type of life cannot be imagined on the earth without the water. There is no other option for water resource. The list of its usages is very long. Entire biotic world uses water to sustain itself. The prosperity of any nation depends on its agriculture and the amount of water it uses in it. Water is also required for drinking, domestic uses and in industries. Water shortage is being created because of the rate and volume at which it is being used by increasing population and for development projects. With this consideration, it is necessary to use water sparingly. Water is a limited resource. No other resource can be used in its place. If the environment exists, it is because of water, so water is an inseparable part of life.

### Sources of water :

There are three sources of water : (1) Rain water (2) Surface water (3) Ground water

**(1) Rain water :** 'Rain' is the original source of water on the earth. River, lakes, streams, well etc. are secondary sources. All these sources exist due to rainfall.

**(2) Surface water :** The water on the surface the earth is found in the form of river, lake, pond, sea streams etc. It is called surface water. Rivers are the main source of surface water.

**(3) Ground water :** Ground water has an important place among the sources of water. Ground water is obtained due to the process of water absorbed by the lower strata of the land. The volume of ground water is unlimited. In the Northern plains of India, there is about 42 % of ground water. In Southern India, there is less of ground water due to the plateau and mountainous region. Ground water is utilised maximum for irrigation.

### Water resources and uses

**Irrigation :** About 84 % of water in India is useful for irrigation, e.g. about 1500 litres of water is required to produce 1kg. of wheat. Paddy, jute and sugarcane crops require more water. Water is being used for irrigation since ancient times. In second century, the famous, Grand Anicut canal, was constructed across the river Kaveri. In 1882, the Eastern Yamuna Canal was constructed in Uttar Pradesh.

There are three mediums of irrigation in India. These are : (1) wells and tube wells (2) canals (3) ponds. Out of these, wells and canals are major mediums of irrigation. Canals and ponds come at second and third place respectively. Canal irrigation is practiced in the vast plains of Satluj, Ganga and Yamuna and also in the delta regions of Mahanadi, Godavari, Krishna and Kaveri rivers in the Eastern plains. Wells and tube wells are very common in alluvial plains. Irrigation by ponds is practiced more in the eastern and southern states.

**Multi-purpose Projects :** Many large and small rivers flow in India. Water transportation is very rich in India. This is because its physiography is such that many rivers merge with other rivers and empty their water into the sea. With the idea that this water may be harnessed for various purposes, multi-purpose projects are planned on many rivers. A multi-purpose project means to solve various problems associated with river valleys. It includes flood control, prevention of soil erosion, water for drinking and irrigation, industries, water provided to settlements, generation of electricity, internal water transportation, entertainment, wild life protection and development of fishery etc.

### Major Multi-purpose Projects of India

Multi-purpose Project	River	States to be benefitted
Bhakhra-Nangal	Satluj	Punjab, Haryana, Rajasthan
Kosi	Kosi	Bihar
Damodar valley	Damodar	Jharkhand, West Bengal
Hirakud	Mahanadi	Odisha
Chambal valley	Chambal	Madhya Pradesh, Rajasthan
Nagarjunsagar	Krishna	Andhra Pradesh, Telangana
Krishnarajsagar	Kaveri	Karnataka, Tamil Nadu
Tungabhadra	Tungabhadra	Karnataka, Andhra Pradesh
Narmada Valley (Sardar Sarovar)	Narmada	Madhya Pradesh, Gujarat, Rajasthan, Maharashtra
Kadana-Vanakbori	Mahisagar	Gujarat
Ukai - kakrapar	Tapi	Gujarat
Dharoi	Sabarmati	Gujarat

#### Distribution of area under irrigation :

There is a difference regarding the area under irrigation in every State. Coastal districts in Andhra Pradesh, delta regions of Godavari and Krishna rivers, Mahanadi delta in Odisha, Kaveri delta in Tamil Nadu, Punjab, Haryana and Western Uttar Pradesh etc. are regions of intensive irrigation of the country.

After Independence, the irrigated area in India has increased four times. Irrigation is practiced in about 38 % of net sown area.

There is a difference in the irrigated area of different States. In Mizoram, 7.3 % area of the total area sown is under irrigation while it is 90.8% in Punjab. There is a vast difference between the total area under irrigation with the total area sown. More than 40% area of the total area sown is under irrigation in Punjab, Haryana, Uttar Pradesh, Bihar, Jammu-Kashmir, Tamil Nadu and Manipur.

#### Water crisis

Water is a natural gift. Water shortage is constantly intensified due to increasing demand for grains by increasing population, to grow cash crops, increasing urbanization and changing life styles of people. The position of water supply and the inequality in the local distribution are challenges to human interests, livelihood and economic development.

Now-a-days, the water crisis is in very alarming stage in arid regions of Western Rajasthan and the interior area of southern peninsular plateau. The quality of water has deteriorated in many villages and some towns. Many water-borne diseases spread due to this.

Availability of pure potable water is the basic need of life. Apart from the attempts made to increase the availability of potable water, there is a large difference between the demand of water and its supply. Even to-day, there is a severe shortage of drinking water in about 8% towns in India. It needs to be done to provide clean drinkable water to about 50 % of villages of the country.

There has been a large increase in the irrigation facilities in India. However,  $\frac{2}{3}$  of agricultural region still depends on rain water. In recent times, the ground water level has gone down considerably due to more and more water is extracted through wells and tube wells. As a result, the ground water resource has decreased. The country is facing severe problems as some states extract ground water in excess volume. Serious problems like reduction in the quality of water and increasing scarcity have to be faced. Besides agriculture, water is used in industries in uncontrolled quantity. Main sources of water pollution are polluted water of domestic uses and industries.

### **Management and conservation of water resources**

We all know that the available water is in limited quantity. Its distribution is also unequal. Along with there is a problem of water pollution. That is why it is necessary to use the water economically and to conserve the available water. 'Water' is such a resource which is directly associated with the entire living organisms. The remedies to conserve water are to be done at different stages. The maintenance of water resources is known as 'water conservation'. Some general remedies of water conservation are as follows. More construction of reservoirs for water storage, connecting two river basins and bringing the ground water at higher level. Water is a national resource.

### **Watershed development**

Watershed is a natural unit and it is used for synthesized development in smaller natural units according to the convenience. A river basin is such an area wherein the water of a river, along with the water of its branches forms a watershed. A watershed region is ultimately a river basin only. The water during the rainy season flows forward and finally meets any river. The development of a watershed is an overall approach of development. It includes the programmes like soil and humidity conservation, water storage, tree plantation, forestation, horticulture, development of pastureland, renewal of collective resource. In all these programmes the land capability and the requirements of people have to be considered. It needs the participation of local people. Many schemes are planned by the State and the Central Government.

### **Rain Water Harvesting**

Special methods to collect the rainwater and conserve it include the construction of wells, small dams, khet talavadi (farm ponds) etc. Water is conserved through these mediums. This also raises the ground water level. This may fulfil the requirements of domestic use and agriculture.

### **Main objectives of rain water harvesting :**

- To increase the capacity to conserve the ground water and increase the underground water table.
- Reduce the water pollution.
- Improve the quality of ground water.
- To save the land routes from water logging.
- Reduce the surface run off of water.
- Fulfil the requirement of domestic water requirements during summer and during long dry spells.
- Fulfil the increasing demand of water.
- Make arrangement to store rain water in underground tanks in multi-storey residence in large cities or arrangement should be made so that the water percolates in the ground.

## Things to know

### Water of the village, water at the border of the village at the border

#### “Bedaj village solves the water problem by water storage.”

The so called backward villagers of Bedaj in Aravalli district understood the value of water and evolved the understanding of water harvesting techniques. They converted the entire region into greenery by conserving about 2.25 crore litres (2 lakhs cubic metres) of rain water. They created an association of the villagers and opted to solve the primary problem of water and they got the cooperation of social institutions of the village. With the cooperation of the institution the people of Bedaj village were made aware and they all agreed not to allow the water of the village and to flow out of the village. The village pond, spread in only 7 vighas, was deepened by 20 to 22 feet. With the financial assistance from the institution, 10 check dams, 11 farm ponds drip in 25 hectars, pipeline in 10 hectars, deep ploughs, small dams were constructed. About 2 lakh cubic metres of rain water was stopped and stored. The stony and dry land was made greener. This pointed a way to others. About 154 vigha of land in Bedaj area got the new facility of water supply. Milk production increased by 12.5% in one year, Water storage increased by 20 to 30 %, due to which the farm production also increased. Today, zaid crops are ruffling in 136 vigha of land of Bedaj for water in Megharaj.

### Following points should be considered for water management :

- Use water economically for gardens, vehicles, in toilets and wash basins.
- Public awareness should be created. Participation in water conservation and its skilled management should be increased.
- If possible recycle the used water.
- Save the reservoirs from pollution.
- Increase the use of all units of water harvesting strcutures like wells, tube wells, khet talavadi etc.
- Keep a watch on the those units which are using ground water.
- Prevent the deterioration of water storage units and repair the damaged pipe lines immediately to stop water pollution.

Uniform steps can not be applied for every area. Local people should be included with their due cooperation for the development and management of water resources of any special region.

Thus, water should be utilised economically. Various methods are being implemented for water conservation. Whether the rainfall occurs or not, the water crisis is pending on us. Whether it is a farm or a water-place in the house, we have to conserve every drop of water. Water is the life.

### Exercise

#### 1. Answer the following questions in details :

- (1) State the remedies to conserve the water.
- (2) Describe the circumstances creating water crisis in India.
- (3) Give information about rain water harvesting.

**2. Write to-the-point answers of the following questions :**

- (1) State the importance of multi-purpose projects.
- (2) Write about the distribution of irrigation.

**3. Write answers for the following questions in brief :**

- (1) State the uses of ground water.
- (2) Which factors should be considered for water management ?

**4. Select the correct option from the options given for the following questions and write answer.**

- (1) Which is the main source of surface water ?  
(A) Rainfall                      (B) Ponds                      (C) Rivers                      (D) Lakes
- (2) Connect the following multi-purpose projects with the beneficiary states and select the correct order.  

(1) Bhakhara-nangal	(a) Bihar
(2) Kosi	(b) Punjab
(3) Nagarjunsagar	(c) Gujarat
(4) Narmada	(d) Andhra Pradesh

  
(A) (1 - b), (2 - a), (3 - c), (4 - d)                      (B) (1 - b), (2 - a), (3 - d), (4 - c)  
(C) (1 - d), (2 - c), (3 - b), (4 - a)                      (D) (1 - c), (2 - d), (3 - a), (4 - b)
- (3) Which of the following statements is not true ?  
(A) Compared to canals, the irrigation through wells and tube wells is more prevalent in india.  
(B) Himalay an rivers are called seasonal rivers.  
(C) Water which is percolated from the surface within the ground is called ground water.  
(D) Punjab and Haryana are leading states in irrigation.
- (4) Which of the statements regarding 'Khet Talavadi' presented in the classroom during the student's debate is true ?  
(A) Jay : It is an important source to obtain water for industries.  
(B) Yash : It is an important part of 'Grow more trees' movement.  
(C) Yug : It is a modern technique to increase soil erosion.  
(D) Daksh : It is a part of rainwater harvesting.
- (5) After arranging the following multi-purpose projects from North to South, which option seems to be correct ?  
(A) Chambal Valley, Bhakhara-nangal, Narmada Valley, Nagarjunsagar  
(B) Bhakhra-nangal, Nagarjunsagar, Narmada Valley, Chambal Valley  
(C) Nagarjunsagar, Chambal Valley, Narmada Valley, Nagarjunsagar  
(D) Bhakhra-nangal, Chambal Valley, Narmada Valley, Nagarjunsagar

### Activity

- A visit to a multi-purpose project located nearby your area.
- Know from your teacher about different sources of water of the nation, used in different fields.
- Collect information about the source of water provided to your village or town from your guardian.
- Prepare charts about important songs or concocted stories about the importance of water.
- Collect information about water conservation from the newspapers and prepare an album about the photographs, write-ups, slogans or Government notification etc.

