CBSE Class 12 Geography
NCERT Solutions
Chapter 16
Water Resources

1. Choose the right answers of the following from the given options.

(i) Which one of the following types describes water as a resource?

1. Abiotic resource
2. Non-renewable Resources
3. Biotic Resource
4. Cyclic Resource

Ans. (4) Cyclic Resource

(ii) Which one of the following rivers has the highest replenishable groundwater resource in the country?

1. The Indus
2. The Brahmaputra
3. The Ganga
4. The Godavari

Ans. (3) The Ganga

(iii) Which of the following figures in cubic kilometres correctly shows the total annual precipitation in India?

1. 2,000
2. 3,000
3. 4,000
4. 5,000

Ans. (3) 4,000

(iv) Which one of the following south Indian states has the highest groundwater utilisation (in per cent) of its total groundwater potential?

1. Tamil Nadu
2. Karnataka
3. Andhra Pradesh
4. Kerala

Ans. (1) Tamil Nadu

(v) The highest proportion of the total water used in the country is in which one of the following sectors?

1. Irrigation
2. Industries
3. Domestic use
4. None of the above

Ans. (1) Irrigation

2. Answer the following questions in about 30 words.

(i) It is said that the water resources in India have been depleting very fast. Discuss the factors responsible for depletion of water resources.

Ans. The factors responsible for the depletion of water resources are as follows:

(i) Increasing population : As a result of increasing population, all the facilities such as houses, shops, roads, offices, pavements, etc. increase to fulfil the increasing demands. This, in turn, decreases the open area for seepage of water into the ground.

(ii) Increasing industries: Most of the stages of manufacturing processes in industries require water. If the number of industries increases, then the water required by them will also increase. Therefore, increase of industries contributes to the depletion of water resources.

(iii) Agricultural activities : India is an agricultural country and agriculture is impossible without water. The water for agriculture is mainly utilised from ground water, rain water and canal water. As there is no rainfall in many places, agriculture cannot be entirely depended on rain water. Also, canal water is available in a few places only. Therefore, ground water is the main source of water for agricultural activities and this causes depletion of water resources.

(ii) What factors are responsible for the highest groundwater development in the states of Punjab, Haryana, and Tamil Nadu?

Ans. The ground water utilisation is very high in the states of Punjab, Haryana and Tamil Nadu because these states are advanced agricultural states.

Water is used mainly in irrigation. The share of agriculture sector in total water utilisation is much higher than other sectors. Irrigation is needed because of spatiotemporal variability in rainfall in the states. The large tracts of the country are deficient in rainfall and are drought prone. Further , the high yielding varieties of crops need regular moisture supply, which is made possible only by a developed irrigation systems.

(iii) Why the share of agricultural sector in total water used in the country is expected to decline?

Ans. The share of agricultural sector in total water used in the country is expected to decline because of below given reasons-

1. The industrial and domestic sectors in the country are likely to increase.
2. The total utilizable water resources are also declining.
3. The overuse of groundwater resources has led to decline in the groundwater.

(iv) What can be possible impacts of consumption of contaminated/unclean water on the people?

Ans. According to the statistics of World Health Organisation, one fourth of communicable diseases in India spread through contaminated or unclean water. Contaminated water containing a number of viruses and harmful germs can be detrimental to human health.

Drinking contaminated water, in medical term, may cause water-related diseases including diarrhea, bacterial dysentery, cholera, typhoid and many other contagious illnesses.

3. Answer the following questions in about 150 words.

(i) Discuss the availability of water resources in the country and the factors that determine its spatial distribution?

Ans. India accounts for about 2.45 per cent of world's surface area, 4 per cent of the world's water resources and about 16 per cent of world's population.The total water available from precipitation in the country in a year is about 4,000 cubic km. The availability from surface water and replenishable groundwater is 1,869 cubic km. Out of this only 60 per cent can be put to beneficial uses. Thus, the total utilisable water resource in the country is only 1,122 cubic km.

The factors that determine its spatial distribution are-

1. **Surface water resources-** There are four major sources of surface water.These are rivers, lakes, ponds, and tanks. In the country, there are about 10,360 rivers and their tributaries longer than 1.6 km each.The mean annual flow in all the river basins in India is estimated to be 1,869 cubic km.

However, due to topographical, hydrological and other constraints, only about 690 cubic km (32 per cent) of the available surface water can be utilised.Water flow in a river depends on size of its catchment area or river basin and rainfall within its catchment area. Some of the rivers in the country like the Ganga,the Brahmaputra, and the Indus have huge catchment areas. Given that precipitation is relatively high in the catchment areas of the Ganga, the Brahmaputra and the Barak rivers, these rivers, although account for only about one-third of the total area in the country, have 60 per cent of the total surface water resources.

2. **Groundwater resources-** The total replenishable groundwater resources in the country are about 432 cubic km. The Ganga and the Brahamaputra basins, have about 46 per cent of the total replenishable groundwater resources. The level of groundwater utilisation is relatively high in the river basins lying in north-western region and parts ofsouth India. The groundwater utilisation is very high in the states of Punjab, Haryana, Rajasthan and

Tamil Nadu. However, there are States like Chhattisgarh, Odisha, Kerala, etc., which utilise only a small proportion of their groundwater potentials. States like Gujarat, Uttar Pradesh, Bihar, Tripura and Maharashtra are utilising their ground water resources at a moderate rate.

3. **Lagoons and Backwaters**- India has a vast coastline and the coast is very indented in some states. Due to this, a numberof lagoons and lakes have formed. The States like Kerala, Odisha and West Bengal have vast surface water resources in these lagoons and lakes. Although, water is generally brackish in these water-bodies, it is used for fishing and irrigating certain varieties of paddy crops,coconuts, etc.

(ii) The depleting water resources may lead to social conflicts and disputes. Elaborate it with suitable examples.

Ans. Demand for water is increasing rapidly with the increase of population. As against this, the supply of usable water is limited. Even this limited supply can be depleted or made unusable by excessive utilisation, pollution or careless management. Moreover, all parts of the country do not possess the same quantity of water. Some areas have surplus water while other areas suffer from chronic shortage of water. The increasing shortage of water is creating tension and causing disputes among nations, states, communities and regions.

Most rivers of India are plagued with inter-state disputes. Almost all the major rivers of the country are inter-state rivers and their waters are shared by two or more than the two states. Following inter-state river water disputes are worth mentioning.

1. Cauvery Water Dispute between Tamil Nadu, Karnataka and Kerala.
2. The Krishna Water Dispute between Maharashtra, Karnataka and Andhra Pradesh.
3. The Tungabhadra Water Dispute between Andhra Pradesh and Karnataka.
4. The Aliyar and Bhivani River Water Dispute between Tamil Nadu and Kerala.
5. The Godavari River Rater Dispute between Andhra Pradesh, Madhya Pradesh, Chhattisgarh, Odisha and Karnataka.
6. The Narmada Water Dispute between Gujarat, Maharashtra, Madhya Pradesh and Rajasthan.
7. The Mahi River Dispute between Gujarat, Rajasthan and Madhya Pradesh.
8. The Ravi and Beas Water Dispute between Punjab, Haryana, Himachal Pradesh,

Rajasthan, Jammu and Kashmir and Delhi.

9. The Satluj-Yamuna Link Canal Dispute between Punjab, Haryana and Rajasthan.
10. The Yamuna Wiver Water Dispute between Uttar Pradesh, Haryana, Himachal Pradesh, Punjab, Rajasthan, Madhya Pradesh and Delhi.
11. The Karmanasa River Water Dispute between Uttar Pradesh and Bihar.
12. The Barak River Water Dispute between Assam and Manipur.

(iii) What is watershed management? Do you think it can play an important role in sustainable development?

Ans. Watershed management is the study of the relevant characteristics of a watershed aimed at the sustainable distribution of its resources and the process of creating and implementing plans, programs, and projects to sustain and enhance watershed functions that affect the plant, animal, and human communities within the watershed boundary.

Watershed management provides a sustainable growth framework for integrated decision-making to help: assess the nature and status of the watershed; identify watershed issues; define and re-evaluate short and long-term objectives, actions and goals; assess benefits and costs; and implement and evaluate actions.

It is correct that it will play an important development in sustainable development:

1. It involves prevention of runoff and storage and recharge of groundwater.

2. Watershed management includes conservation and judicious use of all resources.

3. Watershed management aims at bringing about balance between natural resources on the one hand and society on the other. The success of watershed development largely depends upon community participation.

4. Watershed development projects in some areas have been successful in rejunavating environment and economy.Some of the examples are-

(a) Haryali- Haryali is a watershed development project sponsored by the Central Government which aims at enabling the rural population to conserve water for drinking, irrigation, fisheries and afforestation. The Project is being executed by Gram Panchayats

with people's participation.

(b)Neeru-Meeru(Water and You): This programme is initiated in Andhra Pradesh.The “Neeru-Meeru” approach involves soil and water conservation from ridges to valley, causes water to flow in dry rivers and streams, revives traditional water harvesting structures, adopts a participatory method to increase the rate of ground water recharge, takes up rainwater-harvesting structures in urban areas, promotes recycling of waste water and checks the pollution in water bodies through seepage.

(c)Arvary Pani Sansad: It was initiated in Alwar, Rajasthan. They have taken up constructions of various water-harvesting structures such as percolation tanks, dug out ponds (Johad), check dams, etc. through people's participation. Tamil Nadu has made water harvesting structures in the houses compulsory. No building can be constructed without making structures for water harvesting.