

WATER RESOURCES OF INDIA Class 10

Q. What is Irrigation?

Irrigation refers to the process of watering agricultural plants through artificial means from wells, tanks, canals, tube wells etc.

Q. Give reasons why irrigation is important to a country like India \ Why is there a need to develop irrigation in India?

- * Irrigation is required as rainfall is erratic, sporadic, seasonal and unevenly distributed.
- * Irrigation is required to grow crops throughout the year
- * Some crops like rice and jute require more water than is supplied by rain
- * Irrigation is required to increase agricultural output by providing the right amount of water at the right time
- * Winter crops need irrigation as most parts of India do not get adequate rainfall in winter
- * Irrigation helps in growing commercial crops and multiple crops in a year

Q. Mention the factors available in India for the development of irrigation?

- * Most rivers in North India are snow fed and so are perennial. The excess water can be diverted to fields through canals.
- * The cultivated land in North India is flat and level and is made up of soft alluvial soil, making the construction of canals easier.
- * Most parts of India get sufficient rainfall, though seasonal. The rainwater seeps underground which can be utilized by digging wells and tube wells.
- * South India has developed tank irrigation as rain water collects in the natural hollows in rocky and uneven depressions.
- * North and South India have suitable sites for constructing dams because of the hilly terrain.

Q. Why is irrigation necessary for the growth of the agricultural sector? * Rainfall is seasonal, uncertain and unevenly distributed. * Annual crops need water throughout the year * To maximize agricultural production * Some crops require more water

Q. Name the 3 traditional means of irrigation and why are they still important in most parts of India? Tanks, Wells and Canals. Traditional means have a low initial cost burden, are easy to operate and are easily accessible to farmers.

Q. Mention the conditions suitable for digging wells.

- * The water table should be high. * The ground should have soft rocks.

Q. Mention the advantages and disadvantages of surface wells.

Advantages : * They are the simplest and cheapest means of irrigation. * Wells are an independent source and can be used as and when necessary. * Wells can be dug at any convenient place. * Several chemicals like nitrates, chlorides and sulphates are mixed in well water which add to the fertility of the soil. *

Disadvantages : * Surface wells are not deep enough so may run dry in summer. * They irrigate only a small area of land. * Sometimes these wells have brackish (saline) water which is not suitable for drinking or irrigation.

Q. Name the two types of surface wells.

* Lined or Pucca wells * Unlined or Kachha wells. These wells are developed in areas of high water table. The unlined wells are easier and cheaper to dig but the lined wells are usually perennial.

Q. Mention some of the traditional methods used to draw water from wells.

* Bucket method * Dekhli method – a vertical pole is used for balancing the bucket and an equivalent load is placed at the other end. * Mhote or water wheels which are worked by bullocks.

Q. What is a tube well? It is a very deep bore dug into the ground with a drilling machine and water is pumped out with the help of electricity.

Q. Mention the conditions essential for the construction of tubewells.

* The water table should be high with a perennial supply of water. * The ground water should be of soft alluvial soil to facilitate digging deep. * There should be adequate rainwater to replenish the ground water. * There should be cheap hydroelectric power to raw water.

Q. What are the advantages and disadvantages of tube wells.

Advantages: * They can irrigate a much larger area than surface wells (150 hectares as compared to 1 or 2 hectares by surface wells) * They are more reliable during periods of drought. * They occupy less area than surface wells and do not cause pollution.

Disadvantages : * The farmer has to spend regularly on electricity or diesel. * They irrigate a smaller area compared to canals. * It is not suitable in areas of brackish water and tube wells cause largescale depletion of ground water.

Q. Why are wells more popular in North India as compared to South India.

* Large quantities of underground water are available in the Ganga plain. The water table is high in North India. * Wells are easier to dig in soft alluvial soil. * North India receives sufficient rainfall to replenish the ground water. * Cheap hydel power is available to operate pumps.

Q. Mention 2 factors that favour the development of tube wells in Punjab?

* Ground water table is high. * Soft nature of rocks which makes digging of tube wells easy.
* Availability of cheap hydel power. * Fertile agricultural land to compensate the cost of construction of tube wells.

Q. Why are tube wells installed in fertile productive regions?

The cost of construction and operation of a tube well may be recovered from the increased farm production. It is a permanent source of water, free from pollution and occupies less space.

Q. Name 2 states where tube wells are extensively used. Give a reason to explain its importance as a source of irrigation.

UP, Bihar, Punjab, Haryana. They are perennial and can irrigate a large area. The water is not polluted. They do not dry up easily as a deep boring id made to the permanent ground water table.

Q. Name the 2 types of canals and differentiate between them.

* Perennial Canals: These flow throughout the year and draw water from perennial rivers or artificial lakes. They irrigate much larger areas and are more reliable.

* Inundation Canals: These canals are taken out of rivers without building dams or barrages at their head to regulate the flow of water. These provide water only when the river is in flood- the excess water flows into these canals. These canals irrigate a small area and are not reliable.

Q. Mention the advantages and disadvantages of Canal irrigation.

* Advantages: Perennial canals supply water throughout the year and help to increase agricultural production. They are cheap and easy to build.

*Disadvantages: Problem of salt effervescence due to overflowing makes the soil unsuitable for farming. There is a problem of water logging in the case of unlined canals. To save over flooding it is necessary to line canals with bricks and mortar – this is expensive.

Q. Why are canals more important in North India than in South India?

*The rivers of North India are snow fed but the rivers of South India are rainfed. *The plains of North India are flat with soft alluvial soil so is easy to dig but peninsula India is rocky and so difficult to dig.

Q. Mention the states which are important for wells and canals.

UP, Punjab, Haryana, Bihar, Rajasthan.

Q. Mention the important canal systems in India.

* Punjab and Haryana – Western Yamuna Canal, Bhakra Canal, Nangal dam Canal * UP – Upper Ganga Canal, Lower Ganga Canal, Agra Canal *Indira Gandhi Canal – It utilizes the water of the Beas and Sutlej *Maharashtra – Koyna Project Odisha – Hirakud Project

Q. Why is most of South India not suitable for canal irrigation?

*Rivers are seasonal * Uneven terrain, the hard rocks make it difficult to construct canals.

Q. What is an Inundation canal? It is a canal taken out of a river without any regulating system at the head. The canal is filled with water only during floods or when the river overflows.

Q. Why are inundation canals being converted into perennial canals? Inundation canals are flood water canals and have water only when the river is in flood but perennial canals have water throughout the year. Inundation canals have no regulating system at the head.

Q. Why does canal irrigation lead to the ground around it to become unproductive? *Percolation of water through canals can lead to swamps. * Alkaline salts from the water table below can reach the surface and make the soil unproductive. * Due to water logging the capacity of the soil to absorb water decreases.

Q. What is meant by Tank Irrigation? Tanks are constructed in areas of natural depressions by building earthen embankments or masonry walls to collect water. The water is then used in the dry season.

Q. Mention the conditions for developing tank irrigation.

*Presence of natural depressions and rock strata to prevent seepage of water. * Adequate rainfall

Q. Why are tanks important in the Deccan Plateau? * The terrain is uneven with many natural depressions. * The rocks are hard and this prevents seepage of water. * Peninsula India receives rainfall from the monsoons and this collects in tanks and helps to raise the water table.

Q. Mention the advantages and disadvantages of Tank Irrigation.

*Advantages – It is cheaper than any other means of irrigation since rainwater is collected in natural pits and depressions. * It allows monsoon water to be stored and used later. * It raises the ground water level. * It is difficult to build canals in the Deccan Plateau as they cover a large area and the rocks are hard. Thus tanks are a suitable alternative. * Tank water can also be used for domestic purpose especially in the dry season.

*Disadvantages : * Since tanks are shallow, water is wasted through evaporation. *Tanks get silted and regular desilting is required to make it suitable for irrigation. *Tanks are mainly non

perennial and dry up in the summer. They are not dependable. * Tanks occupy a large area which could be used for farming.

Q. Mention the main regions of Tank irrigation.

Parts of Andhra Pradesh, Tamil Nadu, Karnataka and Odisha.

Q. What are the advantages of using modern methods of Irrigation?

*They are reliable and provide water throughout the year.

*They are easy to operate and irrigate a large area.

Q. Explain the modern methods of irrigation.

*Sprinkler Irrigation: It is a type of overhead irrigation where sprinklers are set up in the fields and supplied with water from hoses from the source of water. There is no loss of water by seepage or evaporation and is best suited to semi desert regions.

* Drip Irrigation : Water is taken directly to the roots of plants or trees. A plastic tube which has small holes is used and water drips through the holes directly to the roots of plants.

*Bamboo Irrigation: In NE India water is poured into bamboo pipes and transported to the fields.

*Furrow Irrigation: Water is diverted through narrow channels dug between rows of crops.

Q. Why are modern methods of irrigation gaining in importance? *No loss of water due to evaporation or leakage * Uses water economically * Helps to conserve water * Reliable and available throughout the year.

Q. Why is Sprinkler irrigation practiced in arid regions? Water is supplied through pipes so it is economical. There is even distribution of water, no loss due to evaporation, minimum wastage of water.

Q. Why is Drip irrigation one of the best modern methods of irrigation? *Water is provided directly to the roots of plants so there is no loss due to evaporation. *Judicious use of water with no wastage. * Flow of water is customised so as to be beneficial to each crop.

Q. Why is there a need to conserve water?

* There is an increased demand, short supply and uneven distribution of water.

*There is large scale pollution due to domestic, agricultural and industrial waste.

*To reduce surface run off and reduce soil erosion.

*There is water scarcity due to industrialisation, overpopulation and irrigation.

Q. Explain the importance of water.

*It is the lifeline of living beings- humans, plants and animals.

*It is essential for agriculture and industries.

*Water is used to produce hydroelectricity.

*It is important for navigation and the existence of marine life.

Q. What is meant by Conservation of water?

It means preventing and controlling the depletion of water and making best use of the available water resources for present and future needs.

Q. Explain the terms- * Ground Water: The water that seeps underground during rainfall and is available as underground water resources.

*Water table: The depth in the soil where all the pore spaces of the soil particles are saturated with water only is called water table.

*Surface water: It is the water found on the surface of the earth in the form of rivers, lakes ponds, etc.

Q. What is meant by water harvesting?

It involves all the different methods of collecting and conserving water. It is the simplest and most effective method of water conservation.

Q. Why is water harvesting necessary?

The amount of surface water is not sufficient to meet the increasing demand and hence the dependence on ground water is increasing. Ground water has decreased greatly as the seepage of rainwater into the subsoil has decreased.

Q. Name 2 methods of water harvesting.

*Rain water harvesting * Recharging of ground water

Q. What is meant by rain water harvesting?

It involves conserving and collecting rain water. It aims at recharging ground water and raising its level. It checks rain water from flowing away and preventing it from getting polluted.

Rain water harvesting is the activity of collecting rain water directly or recharging it into the ground to improve ground water storage in the aquifer.

Q. Explain the Rooftop Rainwater harvesting method.

Rain water can be collected over roof tops and can be channelized through small PVC pipes into underground pits or wells. The purpose is to utilize rain water and not let it run off. It is a simple, practical and cost effective method and also helps to replenish ground water and increase its levels.

Q. What is the importance of rain water harvesting?

*It increases the availability of water during the dry periods by increasing levels in wells.

*Surface water supply is readily available.

*It improves the quality of ground water by diluting salinity. It does not cause pollution and is cost effective.

Q. Mention the regions where rain water harvesting is practiced.

*Johads or Kunds in Rajasthan * Tanks in Gujarat * Dongs in Assam *Kere in Karnataka

Q. Mention the methods of recharging groundwater.

Pit recharge, trenches, dug wells

Q. Mention the methods of Water management.

*Construction of dams *Managing water basins *Recharging ground water *Rain water harvesting *Mass awareness programmes

Q. What is meant by the National Water Policy and mention two objectives?

The Govt of India designed the National water policy for the optimum and judicious utilization, management and conservation of water resources of the country.

Objectives: *To provide surplus water to deficient areas. * Reduce water pollution and recharge ground water. *Reduce runoff and soil erosion.

Q. Why is there a great need to conserve water in India?

- *To meet the increasing demand of the growing population.
- *To provide water for agriculture, irrigation and industrial use.
- *To reduce water scarcity.
- *To prevent pollution of water.
- *To prevent depletion of ground water.

Q. Why are we facing a water scarcity in recent times?

- *A lot of water is polluted or wasted.
- *Demand for pure water is greater than the supply.
- *Overpopulation, urbanization and industrialization.

Q. What are the advantages of rain water harvesting?

- *To increase the ground water table.
- *To meet the demands of increased population and agricultural activities.
- *To prevent wastage of water.
- *Reduce dependence on ground water
- *Check surface run off

Q. What are the methods of water harvesting practised in India?

- *Rainwater harvesting
- *Rooftop harvesting system
- *Ground water recharge
- *Bore wells, dug wells, check dams.

Q. Give a reason for the significance of irrigation in -----*Punjab: Rainfall is seasonal, uncertain and varies from year to year and from place to place. Water is needed for Rabi crops and the region is rich in agriculture. *Rajasthan: The State receives scanty rainfall, western Rajasthan receives less than 25cm rainfall.

Q. Why is the world in danger of facing a water crisis in the future?

Severe water shortage is due to wastage, Pollution, over use and mismanagement. There is increased demand due to growing population, increase in industries and irrigation.

Q. What measures should the government adopt to overcome the present water crisis?

- * Make rainwater harvesting mandatory in every housing colony.
- * Levy fine on wastage.
- * Pass laws to ensure that water is recycled in factories.
- * Watershed development project (hariyali) enabling rural people to conserve water.