Chapter 4: Water Resources

Exercises — Exercises

Q1 Which one of the following types describes water as a resource? (a) Abiotic resource (b) Non-renewable resources (c) Biotic resource (d) Non-cyclic resource

(a) Abiotic resource. Water is a non-living (abiotic) resource. It is also a cyclic resource that keeps being replenished through the water cycle, so it is neither non-renewable nor non-cyclic, and it is not biotic.

Q2 Which one of the following south Indian states has the highest groundwater utilisation (in per cent) of its total ground water potential? (a) Tamil Nadu (b) Karnataka (c) Andhra Pradesh (d) Kerala

(a) Tamil Nadu. The chapter notes that groundwater utilisation is very high in Punjab, Haryana, Rajasthan and Tamil Nadu, while Kerala uses only a small share of its groundwater potential.

Q3 The highest proportion of the total water used in the country is in which one of the following sectors? (a) Irrigation (b) Industries (c) Domestic use (d) None of the above

(a) Irrigation. Agriculture accounts for about 89 per cent of surface water and 92 per cent of groundwater utilisation, far above the industrial and domestic sectors.

Q4 It is said that the water resources in India have been depleting very fast. Discuss the factors responsible for depletion of water resources. (about 30 words)

Rising population reduces per capita availability, while over-use of groundwater, especially for irrigation, lowers the water table. Industrial, agricultural and domestic effluents pollute water, further limiting usable supplies. Uneven rainfall and growing demand add to the depletion.

Q5 What factors are responsible for the highest groundwater development in the states of Punjab, Haryana, and Tamil Nadu? (about 30 words)

Intensive irrigation is the main factor. In Punjab and Haryana, over 85 per cent of net sown area is irrigated, and wells and tubewells serve much of it for wheat and rice. Green revolution crops need assured water, so groundwater use is very high; Tamil Nadu also draws heavily on groundwater.

Q6 Why the share of agricultural sector in total water used in the country is expected to decline? (about 30 words)

With development, industrial and domestic sectors are likely to grow, and their demand for water will rise. As their shares increase, the share of agriculture in total water utilisation, which is at present much higher than other sectors, is expected to decline.

Q7 What can be possible impacts of consumption of contaminated/unclean water on the people? (about 30 words)

Water polluted by micro-organisms, chemicals and industrial wastes is unfit for human use. Organic and bacterial contamination, and toxic metals, fluoride, nitrates or arsenic in groundwater, can harm human health and cause water-borne diseases and long-term ailments.

Q8 Discuss the availability of water resources in the country and factors that determine its spatial distribution. (about 150 words)

India has about 4 per cent of the world's water resources against more than 17 per cent of its population. Annual precipitation is about 4,000 cubic km. Surface water and replenishable groundwater together amount to 1,869 cubic km, of which only about 60 per cent, or 1,122 cubic km, is utilisable. Of the surface flow, only about 690 cubic km (32 per cent) can be used because of topographical and hydrological constraints. Replenishable groundwater is about 432 cubic km. Spatial distribution depends mainly on the size of a river's catchment area or basin and on rainfall within it. Precipitation varies greatly across space and is concentrated in the monsoon season. The Ganga, Brahmaputra and Barak basins have high rainfall and large catchments; though they cover only about one-third of the country's area, they hold 60 per cent of surface water. South Indian rivers like the Godavari, Krishna and Kaveri are largely harnessed, unlike the Ganga and Brahmaputra basins. North-western India and the Deccan plateau are rainfall-deficient and drought prone.

Q9 The depleting water resources may lead to social conflicts and disputes. Elaborate it with suitable examples. (about 150 words)

Water is a cyclic resource, but its availability varies over space and time, and demand is rising while supply shrinks through over-utilisation and pollution. Water scarcity is possibly the greatest challenge societies will face, and sharing and control of this scarce resource is already becoming a contested issue among communities, regions and states. Examples from the chapter show how pressure builds. Punjab, Haryana, Rajasthan and Tamil Nadu use groundwater very heavily, so the water table is falling and fluoride concentrations are rising in Rajasthan and Maharashtra, while arsenic is increasing in parts of West Bengal and Bihar. Rivers such as the Yamuna, Sabarmati and Gomti are severely polluted, cutting usable supply for downstream users. Basins differ widely: south Indian rivers are largely harnessed whereas the Ganga and Brahmaputra basins are not. If present trends continue, demand will outstrip supply, which is detrimental to development and can cause social upheaval and disruptions. Hence inter-State river legislation, water recycling and rainwater harvesting are emphasised.

Q10 What is watershed management? Do you think it can play an important role in sustainable development? (about 150 words)

Watershed management means efficient management and conservation of surface and groundwater resources. It involves preventing runoff and storing and recharging groundwater through percolation tanks, recharge wells and similar methods. In a broader sense it includes conservation, regeneration and judicious use of all natural resources (land, water, plants, animals) and human resources within a watershed, balancing nature and society. Yes, it can play an important role in sustainable development. Haryali, a Centrally sponsored project run by Gram Panchayats, helps rural people conserve water for drinking, irrigation, fisheries and afforestation. Neeru-Meeru in Andhra Pradesh and Arvary Pani Sansad in Alwar built percolation tanks, johads and check dams with people's participation. Ralegan Siddhi in Ahmadnagar, Maharashtra, was transformed through watershed development: wells filled, agriculture flourished and the village became self-reliant. Success depends largely on community participation. Though most programmes are still nascent, spreading awareness and integrated water resource management can ensure water availability on a sustainable basis.