



Question(s)

Give 3 ways in which we use water in our lives.

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Answer(s)

- **Domestic Use** – drinking, cooking bathing etc.
- **Agricultural use** – irrigating crops / water for livestock
- **Industrial use** – use in manufacturing
- **Energy use** – used in the generation of HEP
- **Leisure use** – as in sailing / waterskiing, filling swimming pools etc.

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Question(s)

What is meant by the terms:

- (i) Water surplus
- (ii) Water deficit

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Answer(s)

Water surplus – a supply of water which exceeds demand

Water deficit – where demand exceeds supply

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Question(s)

Define the terms:

- (i) Water security
- (ii) Water Insecurity
- (iii) Water stress

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Answer(s)

(i) **Water Security** – means having access to enough clean water to sustain well-being, good health and economic development.

(ii) **Water Insecurity** – this is where regions do not have access to sufficient water supplies.

(iii) **Water Stress** – countries experience this when there is less than 1700m³ available per person per year.

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Question(s)

Describe patterns of global water scarcity and surplus.

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Answer(s)

- large areas of Africa / Southern Asia suffer water stress (located close to areas of low or no water).

- In contrast areas to the north of the northern hemisphere have plenty of water.

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Question(s)

Describe the pattern of water availability in the UK

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Answer(s)

- There is sometimes water stress in the SE of England – greatest risk of drought – here rainfall totals tend to be lower (but greater proportion of population / demand).

- There is less water stress in Wales / North of England where rainfall totals are much higher.

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Question(s)

What are the main reasons for increasing global water consumption?

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- **Growth of world population** – greater demand (much of the growth in population has been in LICs / NEEs)
- **Economic development results in higher consumption** - e.g. for manufacturing industries
- More water required for **increasing energy production**
- **As people become richer** – demands for water increase e.g. more domestic appliances, watering golf courses etc.
- **As demand for food increases** – more intensive farming requires huge quantities of water
- **Increasing urbanization** – increases demand for water for drinking, sanitation etc. – much of this urbanization is in Africa and Asia

Answer(s)

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Question(s)

List the main factors affecting water supply

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Answer(s)

1. Geology
2. Climate
3. Poverty
4. Pollution of Supply
5. Over-abstraction
6. Limited Infrastructure

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Question(s)

What is an aquifer – how do these affect water supply?

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Answer(s)

Aquifers are water bearing rocks (such as chalk) – water can build up as groundwater in these rocks and provide an important water supply (e.g. the chalk aquifer which feeds London's supplies).

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Question(s)

What is meant by the term over-abstraction?

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Answer(s)

This is the pumping of water out of the ground faster than it is replaced by rainfall which lowers the water table and can cause wells to dry up.

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Question(s)

List the main impacts of water insecurity

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Answer(s)

1. Waterborne disease and water pollution
2. Food production
3. Industrial output
4. Water conflict

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Question(s)

Give examples of waterborne diseases

Answer(s)

Cholera and Dysentery – from drinking untreated water (water can be contaminated by wastewater from agriculture, chemical from manufacturing).

Rivers such as the Ganges – are used for many uses including bathing and irrigation but is also highly polluted.



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Question(s)

How does water insecurity affect food production?

Answer(s)

Agriculture uses 70% of global water supply. Areas of water insecurity will suffer from low food productivity. Water availability from the Nile in Egypt has been reduced by demands from countries using water from upstream in the Nile. Egypt now must import 60% of its food.



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Question(s)

Why does industry have a high demand for water?

Answer(s)

Food processing, paper, textiles and other manufacturing has a heavy demand for water
Water is also required for some forms of energy production (e.g. Nuclear and HEP)



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Question(s)

How can water insecurity lead to water conflict?

Answer(s)

Where water sources cross national / political borders – any pollution, building of dams / reservoirs / over-abstraction can have an impact on one or more countries. Egypt will not allow other countries to build dams or affect the Nile's flow – leads to tension over water rights.



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Question(s)

State four strategies that can be used to increase water supply.

Answer(s)

1. Water diversion and increasing storage
2. Dam and reservoir construction
3. Water transfers
4. Desalination



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Answer(s)



Question(s)

What does water diversion involve?

Where high evaporation is a particular problem, surface water can be pumped underground to be stored in aquifers rather than on the surface to reduce water loss by evaporation – technique used in Florida.

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Answer(s)



Question(s)

What are the benefits of dams and reservoirs for increasing water supply?

Dams control water flow – store water in reservoirs so it can be transported to where needed, used for irrigation and used to help prevent flooding. It can also be used to generate HEP.

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Answer(s)



Question(s)

What are the potential issues with the use of Dams and Reservoirs to increase water supply.

- can reduce flow of water downstream
- in hot arid areas – lots of water may be lost by evaporation
- can involve the forced movement of people from land to be flooded
- dams are expensive

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Answer(s)



Question(s)

What do water transfer schemes involve?

These schemes move water from areas of surplus to deficit using pipelines or canals – but they are expensive.

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Answer(s)



Question(s)

. How does desalination work?

This involves extracting salt from seawater to create fresh drinking water

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Question(s)

What are the problems with desalination as a strategy to increase water supply.

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- Answer(s)**
- very expensive
 - Can cause environmental problems due to salt waste – can be harmful to marine environments
 - Process involves high energy demand (carbon emissions)



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Question(s)

Name and describe a large scale water transfer scheme

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Answer(s) Lesotho Highland Water project

- A highland country surrounded by South Africa – has a water surplus BUT S Africa has a water deficit.
- Project aims to help solve water shortage in South Africa – transferring 40% of the water from Segu River (Lesotho) to the River Vaal (South Africa)



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Question(s)

Describe the benefits of the Lesotho Highland Water Project

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Answer(s)

BENEFITS TO LESOTHO

- provides 75% of Lesotho's GDP
- Supplies all HEP for Lesotho
- Will help sanitation coverage go from 15-20%

BENEFITS TO SOUTH AFRICA

- more reliable water source for irrigation and industry
- increased safe water access to an extra 10% of population
- benefits to the river system from larger quantities of water.

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Question(s)

Describe the costs of the Lesotho Highland Water Project

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Answer(s)

COSTS TO LESOTHO

- unique wetland ecosystem and wildlife disrupted
- 30,000 people already displaced by building of first two dams
- corruption has meant compensation payments haven't reached people.

COSTS TO SOUTH AFRICA

- cost estimated at US\$4 billion
- 40% of water could be lost by leakage
- some poor people may not be able to afford the costs of the water.

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Question(s)

What does the **sustainable development** of water resources mean?

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Answer(s)

Meeting the needs of the present without comprising the ability of future generations to meet their own needs.



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Question(s)

What two things are required to achieve a sustainable water supply?

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Answer(s)



1. A balance between water consumption and water supply
2. Maintain this balance as the water demand continues to rise.

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Question(s)

Give four possible sustainable water use strategies

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Answer(s)



1. Water Conservation
2. Groundwater Management
3. Water Recycling
4. The use of 'Grey Water'

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Question(s)

Give examples of water conservation techniques which can be used to reduce water use / use it more sparingly.

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Answer(s)



1. Reducing Leakages (replacing old pipes / fixing broken pipes)
2. Water meters in homes to reduce water usage
3. Greater efficiency of water use in homes (showers rather than baths; energy efficient appliances and the use of hippos in toilets)
4. Use of more efficient irrigation technique – e.g. drip irrigation

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Question(s)

What does water recycling involve?

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Involves using treated waste water for a range of purposes – including irrigation, electricity generation (cooling) and industry) – e.g. Kolkata – India – treated sewage water is re-used for agriculture.

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Question(s)

What is 'Grey Water'?

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Grey water is the used water from sinks / showers / baths and washing machines – used both inside and outside of the home.

Used for things such as flushing toilets / watering gardens – to minimise use of expensive treated drinking water.

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Question(s)

What does groundwater management involve in HICs?

Answer(s)

The monitoring of water tables and quality of groundwater by local authorities

Regulations imposed on water abstraction to ensure aquifers remain healthy.

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Question(s)

Name and locate an example of a local scheme in a LIC / NEE to increase sustainable water supply.

Answer(s)

Gravity-fed scheme in Hitosa, Ethiopia

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Question(s)

Describe how the gravity-fed sustainable water scheme in Hitosa, Ethiopia works.

Answer(s)

- Hitosa is a semi-arid rural area 160km south of Addis Ababa.
- In the 1990s – a 140km gravity fed water transfer scheme was installed
- Water is moved by pipeline from mountain springs to the lowland villages in the Hitosa district
- This is made available to households using public standpipes and used by farmers to irrigate fields.

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Question(s)

What are the main successes of the gravity-fed sustainable water in Hitosa, Ethiopia

1. Very successful – reliable and safe water provided for over 65,000 – with 25 litres per person per day
2. Scheme is completely community managed (simple to operate and maintain) and has united all communities within the project area
3. Provision of water has had direct economic benefits – many families became involved in cattle fattening and new businesses established.

Answer(s)

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Question(s)

Describe some possible issues with the gravity-fed sustainable water scheme in Hitosa, Ethiopia.

Answer(s)

- As people and livestock are using the water – some disputes and affected hygiene at some tap stands
- Little local interest / awareness / commitment to hygiene education which was implemented as an afterthought
- Initial costs are high and the Pipeline may be too costly / inaccessible to replace in 30 years time.



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