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LEARNING OUTCOMES!

Candidates should be able to:

- identify on a map the Mangla, Tarbela and Warsak dams, and name two examples of barrages
- understand the importance of water as a resource; understand how supplies for agricultural, industrial and domestic purposes are obtained, maintained and controlled as well as used; understand the reasons for, and consequences of, the Indus Water Treaty
- explain and evaluate the causes of and solutions to the problems of water supply (including pollution)
- understand the value of water as a resource for development
- explain and evaluate how water supply issues can lead to conflict.
- describe the different types of irrigation and explain the advantages and disadvantages of each for small-scale subsistence farming, and for the growing of cotton, rice, sugar cane and wheat: – canal irrigation – karez, inundation and perennial canal – lift irrigation – Persian wheel and tubewell
- understand the roles of dams, barrages, link canals, distribution canals, field channels and bunds
- explain the causes of waterlogging and salinity, and:
- explain how land damaged by it can be restored
- evaluate how agricultural practice and water management can be improved to prevent it happening

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IMPORTANCE OF RIVER

- ✓ Adds to scenic beauty
- ✓ Provides water to even those areas where rainfall is extremely low
- ✓ Helps to generate hydroelectricity
- ✓ Increases fertility of land by carrying alluvium and organic matter
- ✓ Fishing is practical in rivers
- ✓ Provides water for domestic and industrial purposes
- ✓ Supplies water for irrigation

USES OF WATER

DOMESTIC USES OF WATER

- ✓ Drinking
- ✓ Bathing
- ✓ Watering the yard and gardens
- ✓ Preparing food
- ✓ Washing clothes and dishes

INDUSTRIAL USES OF WATER

- ✓ Pharmaceutical Industries for injections, syrups
- ✓ Tanning industry for washing, dyeing
- ✓ Food processing industry for preparing juices and beverages
- ✓ Textile Industry for washing, bleaching, blurring, dyeing
- ✓ Iron and Steel industry to cool down furnace for making steel
- ✓ Thermal power station to produce steam that makes the turbines move

AGRICULTURAL USES OF WATER

- ✓ For irrigation
- ✓ For Buffaloes
- ✓ For Food of Livestock

CONFLICTS OVER WATER

- ✓ Domestic vs Industry vs Agriculture
- ✓ Punjab vs Sindh
- ✓ India vs Pakistan (1947-1960)

PRACTICE QUESTIONS 1.1

Question 1 J2017/P2/Q4/C(i-ii)

(c) Study Fig. 6, which shows water use by sector in Pakistan in 2008.

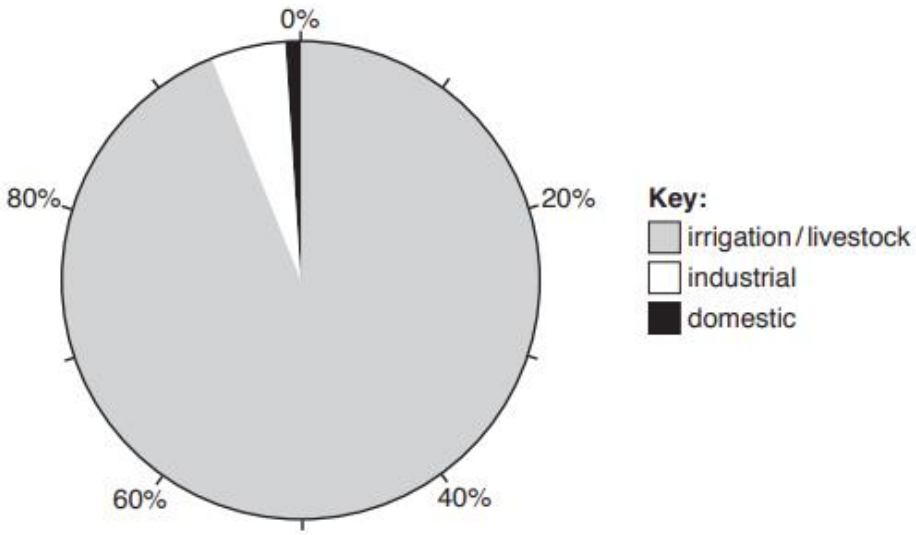


Fig. 6

(i) A Which sector used least water?

.....

B How much water was used by the irrigation/livestock sector?

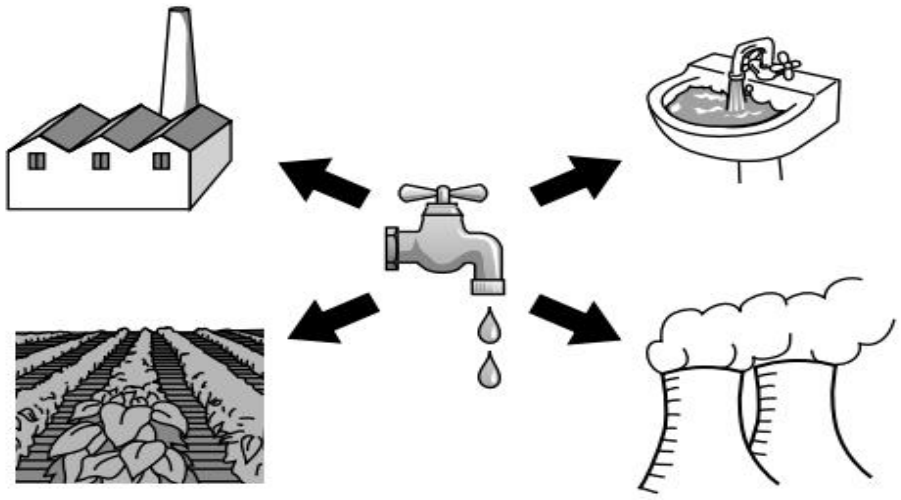
.....[2]

(ii) Name a type of industry that uses large amounts of water.

.....[1]

Question 2 J2013/P2/Q2/D

(d) Study Fig. 3, which shows the main users of water in the Punjab.



Name **two** conflicting users of water supplies in the Punjab shown on Fig. 3. Explain briefly why each user thinks that they should have more water.

users 1 ..... 2 .....

reason for user 1 needing more water

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reason for user 2 needing more water

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.....[5]

Question 3 N2006/P2/Q2/C

(c) Read the extract Fig. 2.

> Pakistan is a water-deficit country. The rainfall is neither sufficient nor regular, and does not meet the growing need for water. Agriculture is a major user, and good yields depend on the adequate availability of water at the right time. The increasing pressures of population and industrialisation have already placed great demands on water supplies and there are an ever-increasing number of local and regional conflicts over water availability and use.

Fig. 2

(i) Why do the writers refer to Pakistan as a 'water-deficit country'? [2]

(ii) Using examples, explain why there are conflicts over water availability and use. [7]

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INDUS WATER TREATY

- ✓ Most of Pakistan suffers from low rainfall and unreliable rainfall
- ✓ Increasing population means more food is needed
- ✓ Could only be provided by irrigated land
- ✓ India cut off water supplies to Pakistan so famine starvation, crops failed and land became arid
- ✓ Threatened Pakistan
- ✓ Pakistan made to buy water from India
- ✓ Treaty included construction of Tarbela and Mangla dams, construction of 5 barrages, remodeling of existing canals and head works and construction of eight link canals

Importance

- Ensures that India does not restrict Pakistan's water supply. Water supply in Pakistan is maintained
- Pakistan has now exclusive rights to waters of the rivers Indus, Jhelum, and Chenab
- Maintains agricultural production
- Tarbela and Mangla dams built [to store water]
- Barrages / link canals built [to distribute water]
- Enabled construction cost of works to be shared with Western countries and India

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PRACTICE QUESTIONS 1.2

Question 1 N2014/P2/Q1/C

(c) Explain the importance of the Indus Water Treaty to Pakistan.

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.....[4]

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IRRIGATION

✓ Artificial supply of water

MODERN	TRADITONAL
Perennial Canals	Inundation and Diversion Canals
Tubewell	Karez
Sprinklers	Persian Wheel
Tankers	Shaduf
	Tank Irrigation

MODERN METHODS

Advantages

✓ More efficient / faster / does not need to rest
✓ For larger area / more water / goes deeper
✓ Regular supply / can be used at any time of year / continuous
✓ Less labour required
✓ Cleaner water
✓ Reduces waterlogging and salinity (only tubewells)

Disadvantages

✓ Expensive / cannot be used by poor farmers
✓ High Maintenance cost
✓ Needs fuel /electricity / diesel etc.
✓ Reduces groundwater / lowers water table

TRADITIONAL METHODS

Advantages

✓ Cheap / can be used by poor farmers
✓ Low Maintenance cost
✓ Does not need fuel /electricity / diesel etc.
✓ Do not reduce groundwater / lowers water table

Disadvantages

- ✓ Less efficient / slower
- ✓ For smaller area / less water
- ✓ No Regular supply / cannot be used at any time of year
- ✓ More labour required
- ✓ Unclean water
- ✓ Waterlogging and salinity

WHY IRRIGATION IS NEEDED?

- ✓ Insufficient annual rainfall
- ✓ Most of Pakistan is arid
- ✓ Monsoon is variable in amount, timings and distributions
- ✓ High temperature condition which leads to a great degree of evapotranspiration
- ✓ 1/3rd of country in south has less than 10 rainy days in a year
- ✓ 2/3rd has less than 20 rainy days in a year

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PRACTICE QUESTIONS 1.3

Question 1 J2011/P2/Q1/A(ii)

(ii) What are the advantages and disadvantages of replacing this Persian Wheel with a tubewell?

Advantages .....

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Disadvantages .....

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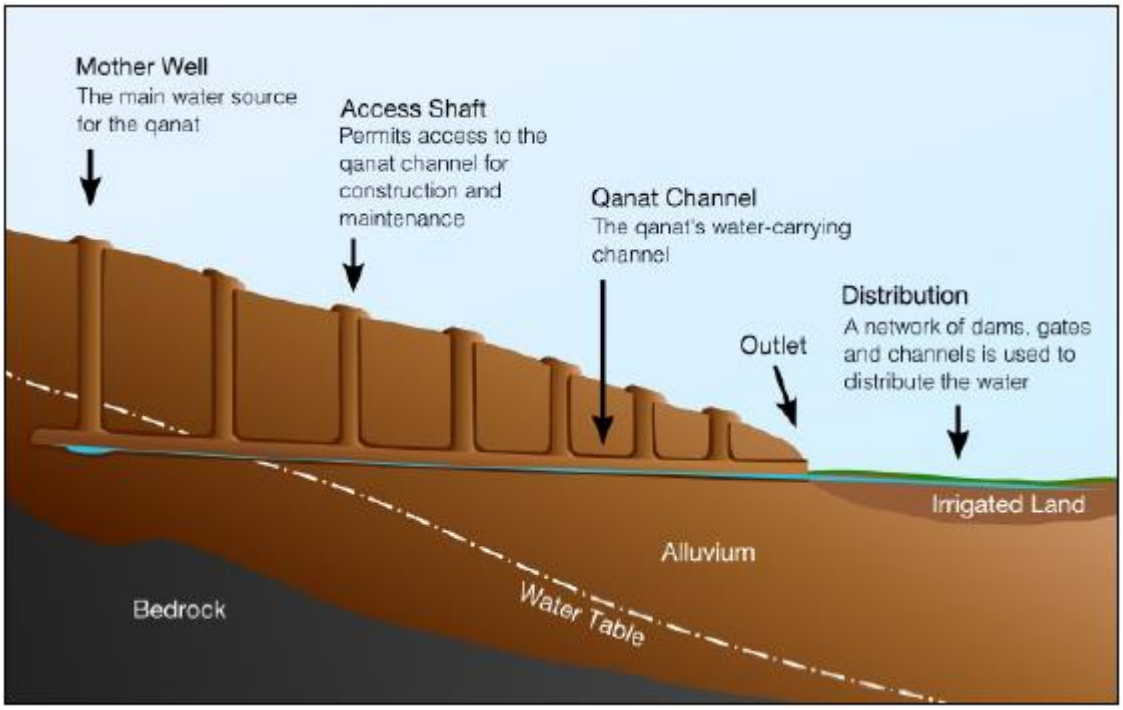
.....[4]

KAREZ

- ✓ When rainfall occurs in mountains, water sinks into the ground
- ✓ Karez is a water tunnel or narrow underground canal
- ✓ It starts from the base of hill or mountain or run 1-2 km underground before it emerges above ground
- ✓ Length depends on the distance between source of Karez and the command area
- ✓ Throughout its length it is dotted with vertical shafts which are used to clean and repair it
- ✓ Selecting of site for digging is done by experienced village elders
- ✓ Digging and repair is done by a group of trained labors
- ✓ It is privately owned by group of people rather than a single person
- ✓ Owner's share water according to percentage share in Karez
- ✓ Karez are drying out in areas where there are no tube wells
- ✓ Karez are drying because they are neglected



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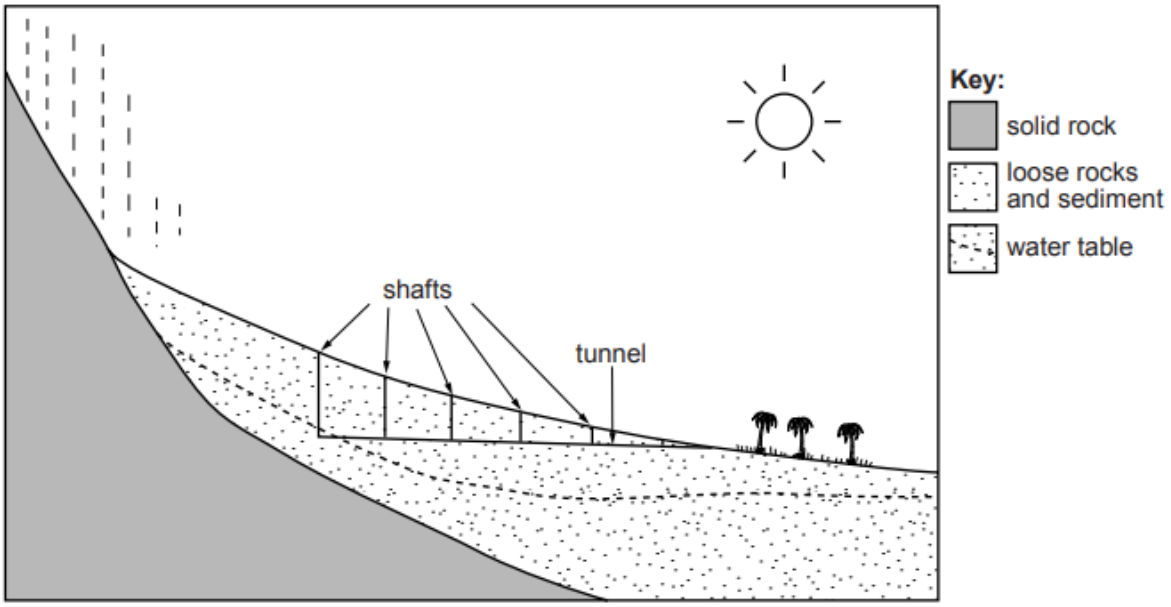
PRACTICE QUESTIONS 1.4

Question 1 N2012/P2/Q3/A

(a) Study Fig. 4 which shows an irrigation system.



(i) Name the irrigation system shown in Fig. 4.

.....[1]

(ii) Name an area of Pakistan where it is used.

.....[1]

(iii) Explain how this system provides water for agriculture in this area.

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.....[4]

(iv) Name a fruit crop grown in this area.

.....[1]

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PERSIAN WHEEL

- ✓ Powered by blind-folded bullock using wooden shaft
- ✓ It turns a horizontal wooden wheel
- ✓ It is geared to a vertical wheel at the end of the shaft
- ✓ This carries the vertical metal wheel which is attached to chain of pots
- ✓ Pots raise water from the well and spill their contents in to channel that leads to the fields

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PRACTICE QUESTIONS 1.5

Question 1 J2011/P2/Q1/A(i)

(a) Study Photograph A (Insert), a Persian Wheel.

(i) With reference to the photograph, explain how this machine is used for water supply.

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.....[3]

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SHADUF

- ✓ Consists of bucket suspended by a rope from one end of a pole
- ✓ Weight is placed at the other end of the pole
- ✓ The pole is suspended on a y-shaped post at a well or a river bank
- ✓ The bucket is dipped in to water by hand and weight at the other end of the pole helps to lift it up
- ✓ One tenth of a hectare can be irrigated daily

TANK IRRIGATION

- ✓ Tank is a reservoir of any specific size
- ✓ There are practised by constructing mud banks across small streams or constructed across slopes for collecting and preserving rain water and surface runoff from mountain slopes
- ✓ Preserve water for dry season
- ✓ Occupy large area
- ✓ Evaporation

INUNDATION CANALS

- ✓ Long canals taken off from large rivers
- ✓ They receive water when river is high enough and especially when it is flood
- ✓ Active in summers
- ✓ No control over water supply
- ✓ Irrigates small area
- ✓ Taken out from IJCRS
- ✓ No waterlogging and salinity because evaporation rate is higher

DIVERSION CANALS

- ✓ Narrow version of an inundation canal
- ✓ Water is taken off from narrow streams through small man-made channels often high up on valley sides to small terraced fields
- ✓ Irrigates small area
- ✓ Practiced only when river is full
- ✓ Practiced in northern mountains

PERENNIAL CANALS

- ✓ Canals which supply water to their commercial areas throughout the year
- ✓ Supply water throughout the year
- ✓ Water is always available when needed
- ✓ Water can be better controlled
- ✓ Reliable
- ✓ Fills rainfall gaps
- ✓ Irrigates large areas
- ✓ Non fuel costs
- ✓ Cheap to use
- ✓ Evaporation losses
- ✓ Seepage losses if canals are unlined
- ✓ Cost of construction is high
- ✓ Deposition of silt
- ✓ Growth of dengue
- ✓ Need extra costs to treat algae growth

LINK CANALS

- ✓ Take water from western river for eastern river
- ✓ To compensate for water lost to India from eastern river
- ✓ Balloki – Sulamanki (Ravi to Sutlej)
- ✓ Chasma – Jhelum (Indus to Jhelum)
- ✓ Marala – Ravi (Chenab to Ravi)
- ✓ Qadirabad – Balloki (Chenab to Ravi)
- ✓ Rasul – Qadirabad (Jhelum to Chenab)
- ✓ Taunsa – Punjnad (Indus to Chenab)

PRACTICE QUESTIONS 1.6

Question 1 N2014/P2/Q1/B

(b) What is meant by

A a link canal .....

.....

B a perennial canal .....

.....

C an inundation canal? .....

.....[3]

Question 2 J2013/P2/Q2/A,C

(a) Study Fig. 2, which shows the perennial canal system in Pakistan.

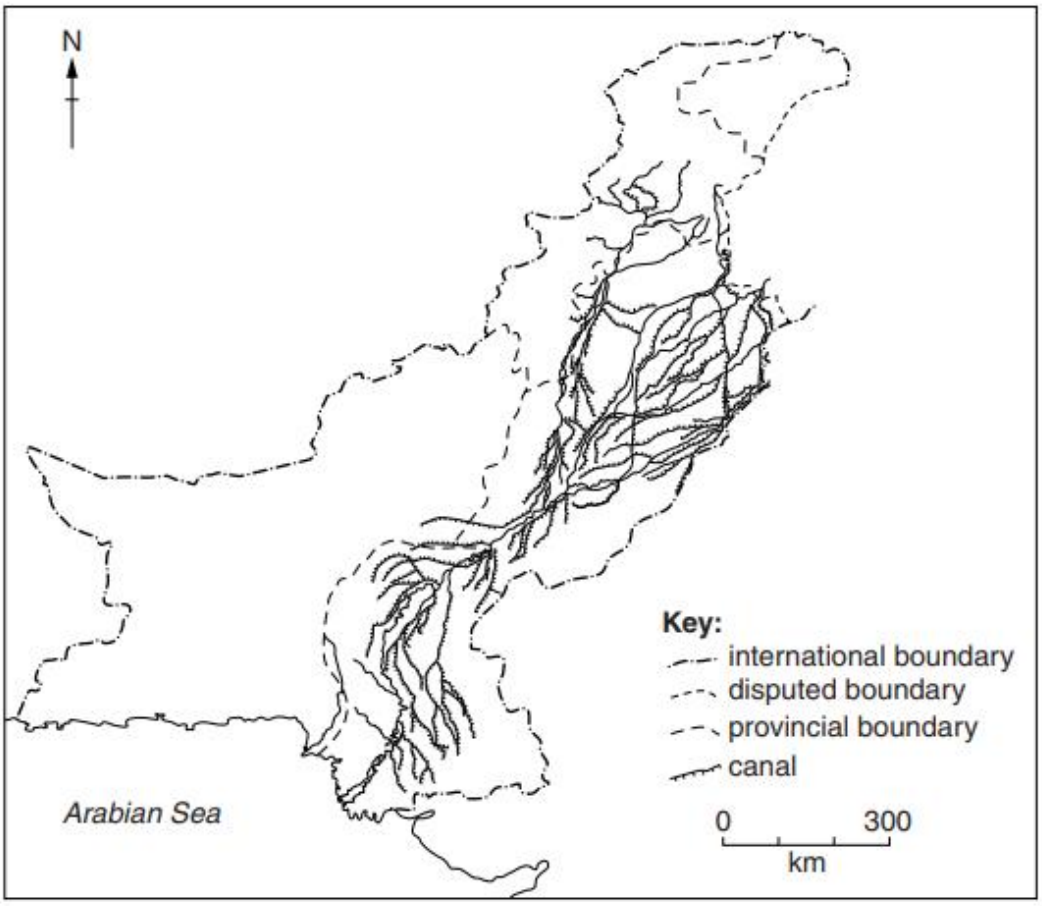

Fig. 2

Describe the distribution of the perennial canals.

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.....[4]

(c) Explain how a perennial supply of water can damage farmland.

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.....[4]

Question 3 **N2005/P2/Q1/C(i)**

(c) **(i)** What are perennial canals, and why are they better for farming than inundation canals? [3]

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TUBEWELLS

- ✓ Long metal tube is drilled into the ground till it reaches the underground aquifer
- ✓ Water is then pumped up
- ✓ In drier regions that don't receive sufficient rainfall and lack irrigation systems, tube wells are often attached to motor pumps, which are operated by electricity or diesel.
- ✓ When water is pumped up it flows in to ponds from where it is distributed to fields by canals pipes or sprinklers
- ✓ They can tap water from depth of 92m or more to irrigate farms of more than 1000 nectars.
- ✓ Punjab is leading user of tube wells
- ✓ Irrigates large area
- ✓ No labour
- ✓ Continuous supply
- ✓ Reduces water logging and salinity
- ✓ Control of water
- ✓ Water available throughout the year
- ✓ Increases yield
- ✓ Lower water table
- ✓ Hugh cost of installation High maintenance cost
- ✓ Lack of electricity
- ✓ Lack of technology for pumps
- ✓ Deplete ground water
- ✓ Limited to large scale commercial farms

SPRINKLER / SPRAY IRRIGATION

- ✓ Pressurized water from public pipes is sprayed over plants to provide then with water
- ✓ This system can be of any size, ranging from a home sprinkler used to keep a lawn green to industrial sized sprinklers used to irrigate crops
- ✓ Some sprinklers heads only spray in one direction while others rotate as they spray
- ✓ Very less water loss
- ✓ Can be used according to farmer's requirement can be well controlled
- ✓ No labour required
- ✓ Equal distribution of water
- ✓ More efficient
- ✓ Less time consuming
- ✓ Expensive to install
- ✓ Requires pumping, electricity is expensive
- ✓ Irrigates limited land
- ✓ Lack of technology
- ✓ High winds can drift spray

TANKERS

- ✓ Tankers collect water from ponds, lakes and ground water and provide it to households, fields and linear plantations
- ✓ Expensive

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PRACTICE QUESTIONS 1.7

Question 1 J2013/P2/Q2/B

(b) Name **three** types of irrigation, other than perennial canals, used in Pakistan. Explain briefly how each type works.

1 .....

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2 .....

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3 .....

.....

.....[6]

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RIVERS

- ✓ Indus
- ✓ Jhelum
- ✓ Chenab
- ✓ Ravi
- ✓ Sutlej
- ✓ Kabul

DAMS

- ✓ Tarbela (Indus)
- ✓ Mangla (Jhelum)
- ✓ Warsak (Kabul)

SMALL DAMS	LARGE DAMS
Store water for irrigation	Store water for irrigation
Irrigates local areas only	Irrigates a vast area
Supply water for industrial and domestic use	Supply water from industrial and domestic use
Supply little or no electricity	Major suppliers of HEP
Silting problem easier to solve	Silting problem difficult to solve
Low initial investment	High initial investment
Maintenance cost is low	Maintenance cost is high
Less construction time	More construction time
Less important for flood	More important for flood

BARRAGES

- ✓ Large structure used for irrigation and flood control
- ✓ Not involved in the generation of electricity
- ✓ Cost of construction is less than that of dam
- ✓ Can be made even in flat areas
- ✓ Size and capacity of barrage depends on the width of the river
- ✓ Sukkur Barrage on River Indus and irrigates Nawabshah, Larkana
- ✓ Guddu Barrage on River Indus and irrigates Jacobad, Ghotki
- ✓ Kotri Barrage on River Indus and irrigates Hyderabad, Badin, Thatta
- ✓ Marala Barrage on River Chenab and irrigates Sialkot, Gujranwala
- ✓ Rasul Barrage on River Jhelum and irrigates Sargodha, Gujrat

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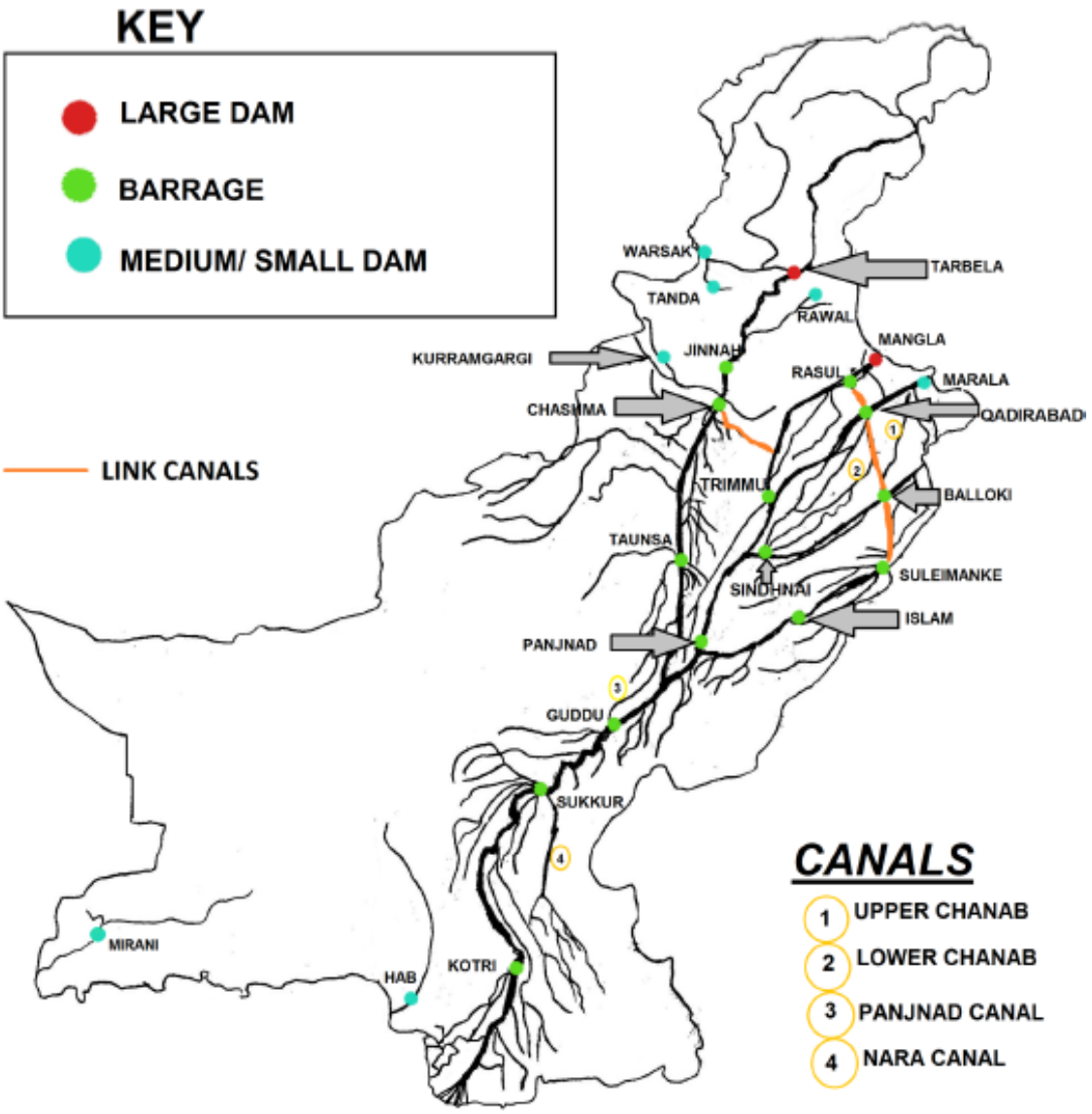

PRACTICE QUESTIONS 1.8

Question 1 N2015/P2/Q1/B

(b) Study Fig. 1, a map showing the major rivers of Pakistan.

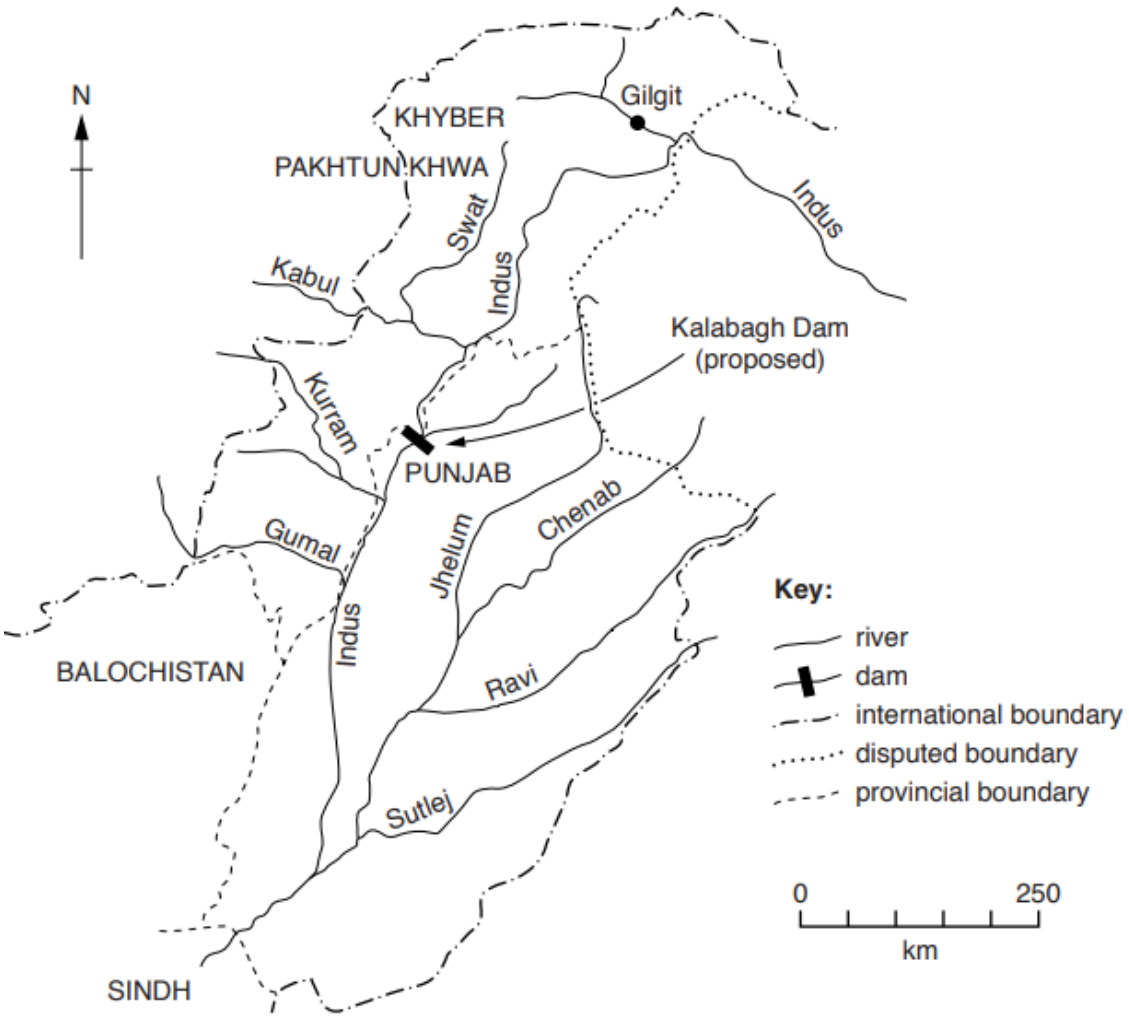

Fig. 1

(i) Locate the following two dams **on the map**:

- Warsak (**W**);
- Diamir Bhasha (under construction) (**D**). This dam is 150 km downstream of Gilgit.

Mark their positions using the appropriate symbol from the key and label each with the correct letter. [2]

(ii) What are the advantages of building a dam at the Diamir Bhasha site?

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.....[4]

(iii) Read the following article about the proposal to build a new dam, the Kalabagh, on the River Indus at the point indicated on the map, Fig. 1.

> Kalabagh Dam – A Controversial Issue
>
> Punjab wants the Kalabagh Dam to be built, but there is opposition to the project from a section of the population in Sindh, Khyber Pakhtunkhwa and Balochistan.
>
> Those who are opposed to the dam argue that it might be beneficial for Punjab and harmful for the other provinces.
>
> The Kalabagh Dam issue is difficult to resolve at this stage.

Describe the disputes over water availability and use which can arise from proposals to build dams at sites such as this.

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.....[4]

Question 2 N2014/P2/Q1/A

(a) Study Fig. 1 which shows a map of Pakistan.

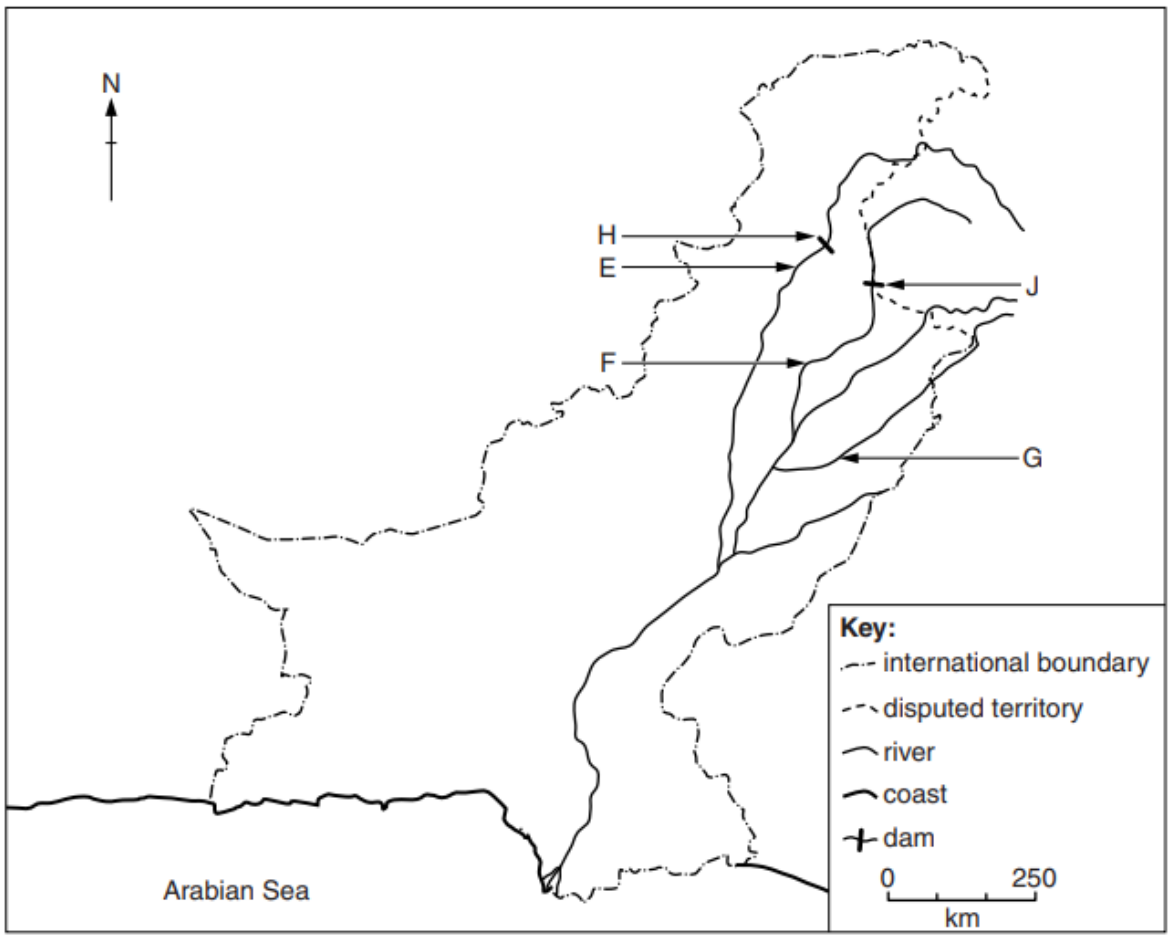

Fig. 1

Name:

(i) The rivers

E .....

F .....

G ..... [3]

(ii) **One** of the dams

H .....

or

J ..... [1]

Question 3 J2009/P2/Q1/A-B

(a) Study Photograph **A** (Insert) showing the Hanna Dam.

(i) Describe the site of the dam. [3]

(ii) What evidence shows that the water level in the reservoir is low? [1]

Study Photograph **B** (Insert) showing the Balloki Barrage.

(b) Compare the barrage shown in Photograph **B** with the dam in Photograph **A**. [3]

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WATERLOGGING AND SALINITY

- ✓ An irrigated area is said to be waterlogged when subsoil water rises high
- ✓ Caused by too much irrigation water
- ✓ Water table rises
- ✓ Soil becomes too wet, forming, puddles of water
- ✓ Water rises up wards carrying salts
- ✓ Evaporation causes salinity
- ✓ Salt patches
- ✓ Salt poisons crops so they die

Why Problem For Farmers?

- ✓ Reduces cultivable area
- ✓ Reduces yield
- ✓ Reduces income & profit
- ✓ Expensive to reclaim land

MEASURES FOR W.LOGGING AND SALINITY

- ✓ Use of gypsum
- ✓ Canal closures to control volume of water
- ✓ Planting eucalyptus tree to lower water underground
- ✓ Surface drain
- ✓ Planned closures
- ✓ Lining of canals
- ✓ Installing tube wells

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PRACTICE QUESTIONS 1.9

Question 1 J2014/P2/Q1/D

(d) Describe the ways in which damage by waterlogging and salinity can be prevented.

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.....[6]

Question 2 J2011/P2/Q1/D

(d) Explain why waterlogging and salinity of soils causes problems to farmers.

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.....[6]

Question 3 N2007/P2/Q1/C

(c) (i) Why do problems of waterlogging and salinity occur in some irrigated areas? [3]

(ii) How can these problems be overcome? [5]

Question 4 N2006/P2/Q2/B

(b) Study Photograph B (Insert), which shows an area in Hyderabad District damaged by waterlogging and salinity.

(i) Describe the appearance of the area **S** in Photograph B. [3]

(ii) What are perennial canals, and how may they lead to problems such as those in area **S**? [4]

(iii) How can these problems be reduced? [4]

Question 5 N2005/P2/Q1/C(ii-iii)

(ii) How may irrigation damage the soil? [3]

(iii) How may this damage be overcome? [6]

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CAUSES OF WATER POLLUTION

- ✓ Sewage discharged into rivers
- ✓ Domestic waste thrown into rivers
- ✓ Pesticides/fertillisers runoff from agricultural fields
- ✓ Industrial waste thrown into rivers
- ✓ Waste from ship discharged into rivers
- ✓ Leakage of oil from ship

EFFECTS OF WATER POLLUTION

- ✓ Not for drinking / poisonous / contaminates groundwater
- ✓ Cost of treatment
- ✓ Causes disease – risk of cholera, typhoid, diarrhoea , hepatitis, dysentery etc.
- ✓ Not for food processing (e.g. fish canning)
- ✓ Smells
- ✓ Reduces fish catch / kills fish
- ✓ Can damage machinery
- ✓ Blocks ditches / canals / causes flooding
- ✓ Risk of malaria from stagnant water

SOLUTION OF WATER POLLUTION

- ✓ Treatment of sewage
- ✓ Improve sanitation facilities in poor quality housing
- ✓ Proper dumping of domestic and industrial waste
- ✓ Organic farming (Alternative to chemical fertillisers/pesticides)
- ✓ Fines on Water polluters
- ✓ Maintenance of ships

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PRACTICE QUESTIONS 1.10

Question 1 N2015/P2/Q1/A

(a) (i) Describe **two** ways in which water supplies can be polluted.

1 .....

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2 .....

.....[2]

(ii) For **one** of these ways explain how the problem caused by pollution can be solved.

.....

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.....

.....[2]

Question 2 J2011/P2/Q1/E

(e) Water pollution is a major problem in urban areas.
With reference to examples, explain some of the causes of this pollution, and why it is a major problem to the people who rely on this water supply.

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.....[6]

Question 3 N2008/P2/Q2/C

Study Fig. 3, a map of environmental damage in Pakistan.

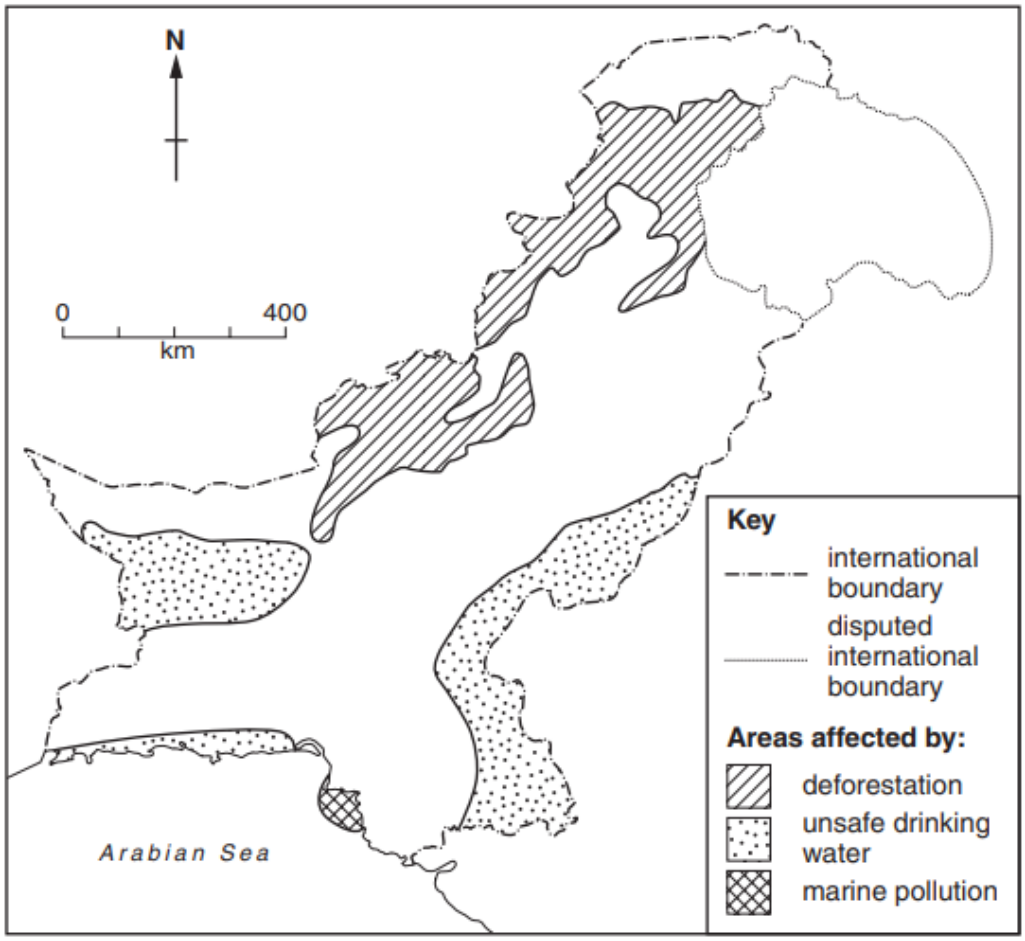

Fig. 3

(c) Study Fig. 3 again.

(i) Locate **one** area of

A unsafe drinking water,
B marine pollution. [2]

(ii) Explain how industries can pollute river and sea water. [4]

(iii) Explain how this pollution affects farming, fishing and wildlife. [6]

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SILTATION

- ✓ Deposition of rock/sand/silt in river/dams/barrages

CAUSES OF SILTATION

- ✓ Deforestation
- ✓ Destruction of mountains by agents of erosion
- ✓ Unlined canals

EFFECTS OF SILTATION

- ✓ Blockage of canals
- ✓ Weakens the foundation of dams
- ✓ Croaking of irrigation canals
- ✓ Reduces capacity of reservoir
- ✓ Less HEP
- ✓ Less water for irrigation

SOLUTIONS FOR SILTATION

- ✓ Afforestation
- ✓ Reforestation
- ✓ Lined canals
- ✓ Installation of silt traps
- ✓ Raise height of dam

HOW WATER IS LOST?

- ✓ Seepage from beds of canals/absorbed into the soil/land/no canal lining;
- ✓ Evaporation/evapotranspiration from surface of canals/tanks/flooded land;
- ✓ Excessive runoff of water immediately into streams/rivers;
- ✓ Theft of water/theft from canals;
- ✓ Water drawn up by vegetation on side of canal;
- ✓ Mismanagement.

PRACTICE QUESTIONS 1.11

Question 1 J2017/P2/Q4/C(iii)

(iii) About 60% of irrigation water is lost before it reaches crops. Give **three** reasons why irrigation water is lost in this way.

1 .....

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2 .....

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3 .....

.....[3]

Question 2 J2009/P2/Q1/C

(c) Study Fig. 1, a graph showing the amount of water stored in the reservoir of the Hanna Dam.

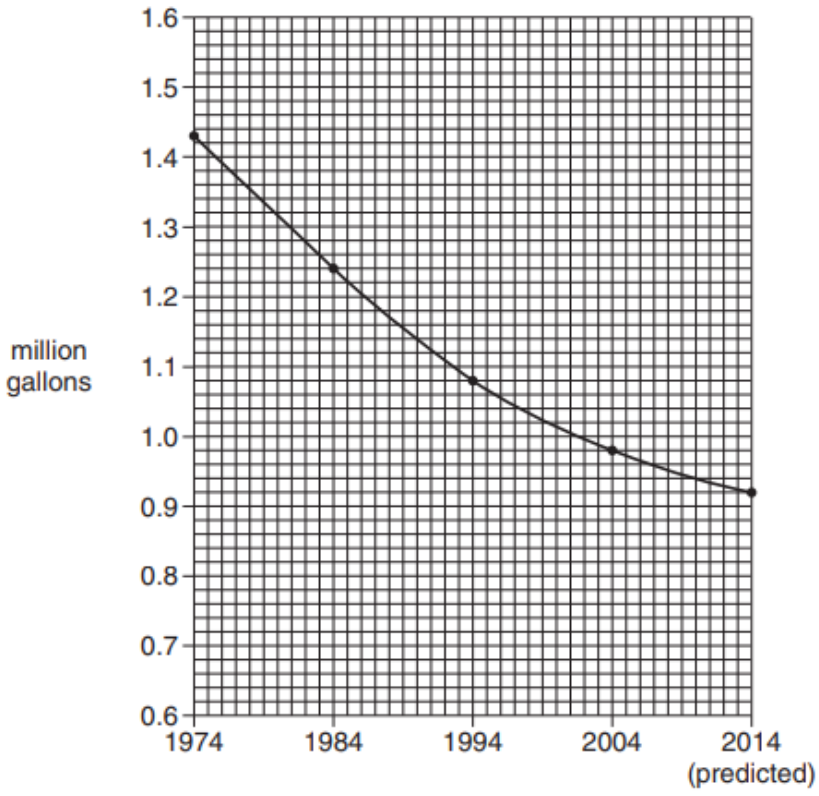

Fig. 1

(i) By how much did the amount of water decrease from 1974 to 2004? [1]

(ii) Suggest why the amount of water stored in the reservoir is decreasing. [2]

(iii) What can be done to stop the amount of water in the reservoir from reducing further? [3]

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HOW TO INCREASE WATER SUPPLY?

- ✓ Rivers available
- ✓ Rainfall in monsoon
- ✓ Glaciers melt so water from mountains
- ✓ Use Flat land for canals
- ✓ Small Dams should be developed to store surplus flow during monsoon season
- ✓ Canals should be lined
- ✓ Fresh – water resources should not be used as dumping sites of solid and liquid waste
- ✓ Controlling seepage of toxic waste in to ground
- ✓ Desalination of sea water
- ✓ Awareness

PROBLEMS IN INCREASING WATER SUPPLY?

- ✓ not enough river water
- ✓ not enough rain
- ✓ loss by leakage, siltation
- ✓ Indus Water Treaty restricts water in reservoirs/rivers
- ✓ evaporation in hot climate
- ✓ pollution
- ✓ demands always increasing
- ✓ some places remote (e.g. Baluchistan)
- ✓ lack of funds/government will
- ✓ Cost of reservoirs, canals etc
- ✓ Cost of tubewells
- ✓ Lack of reservoirs / dams / barrages
- ✓ Indus Treaty limits supply / conflict with India over supplies
- ✓ Lower water table restricts groundwater
- ✓ Waterlogging and salinity problems
- ✓ Lack of / cost of power supplies for pumps
- ✓ Other constraints, e.g. education, wastage, conflict between users etc.

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PRACTICE QUESTIONS 1.12

Question 1 J2013/P2/Q2/E

(e) To what extent is it possible to increase water supply in Pakistan?

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Question 2 N2011/P2/Q5/D

(d) Consider the feasibility of improving water supply to farmers in Punjab and Sindh.

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Question 3 J2011/P2/Q1/B-C

(b) Study Fig. 1, which shows canal water supply in Pakistan.

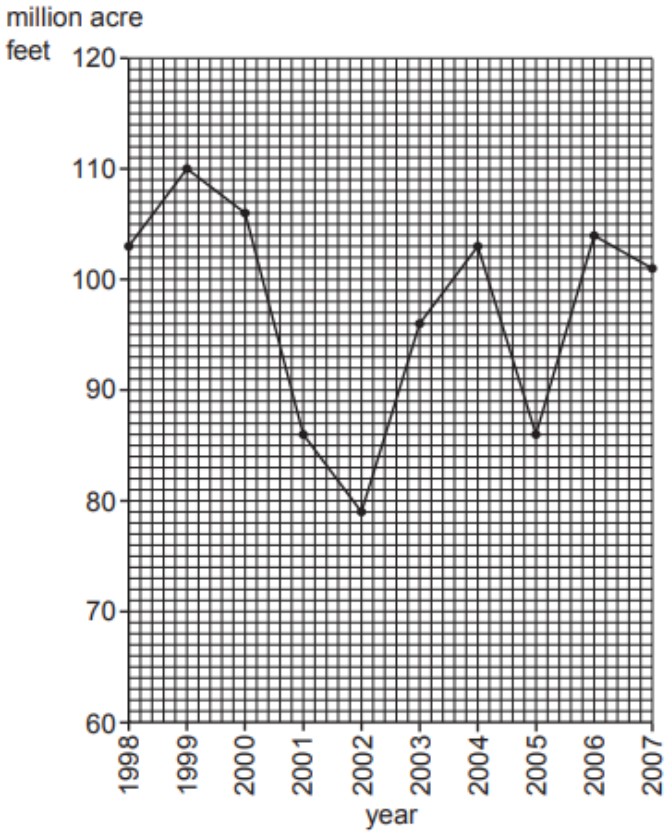

Fig. 1

(i) In which year was the water supply highest?

.....[1]

(ii) How much higher was this than the supply in 2002?

..... million acre feet [1]

(c) Why is there not enough water supply from canals to meet the needs of all users?

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MUHAMMAD YOUSUF MEMON

REVIEW EXERCISE

Question 1 J2017/P2/Q4/D

(d) Read the following two views about water shortages in Pakistan:

A

The best way to prevent water shortages in Pakistan is to build more dams and other infrastructure projects. These will store or supply more water.

B

The best way to prevent water shortages in Pakistan is to educate people about different methods of saving water. These methods could be carried out in agriculture, industry, and in homes.

Which view do you agree with more? Give reasons to support your answer and refer to examples you have studied. You should consider **both** View A and View B in your answer.

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Question 2 N2009/P2/Q1/E

(e) Read Fig. 3, an extract from a magazine.

> Most farmers in Balochistan do not have access to water from the River Indus.
> There are many small rivers that flow into shallow lakes but they are dry for most of the year. These small rivers can provide some water for irrigation. Other sources of water are underground, and some water flows in tunnels from the mountains.
>
> *Irrigation News*

Fig. 3

Describe the irrigation methods that can be used by farmers in Balochistan and comment on the success of such schemes for increasing farming output. [6]

RECENT PAST PAPER QUESTIONS

Question 1 N2019/P2/Q2

(a) Study Fig. 2.1, a map showing the major rivers of Pakistan.

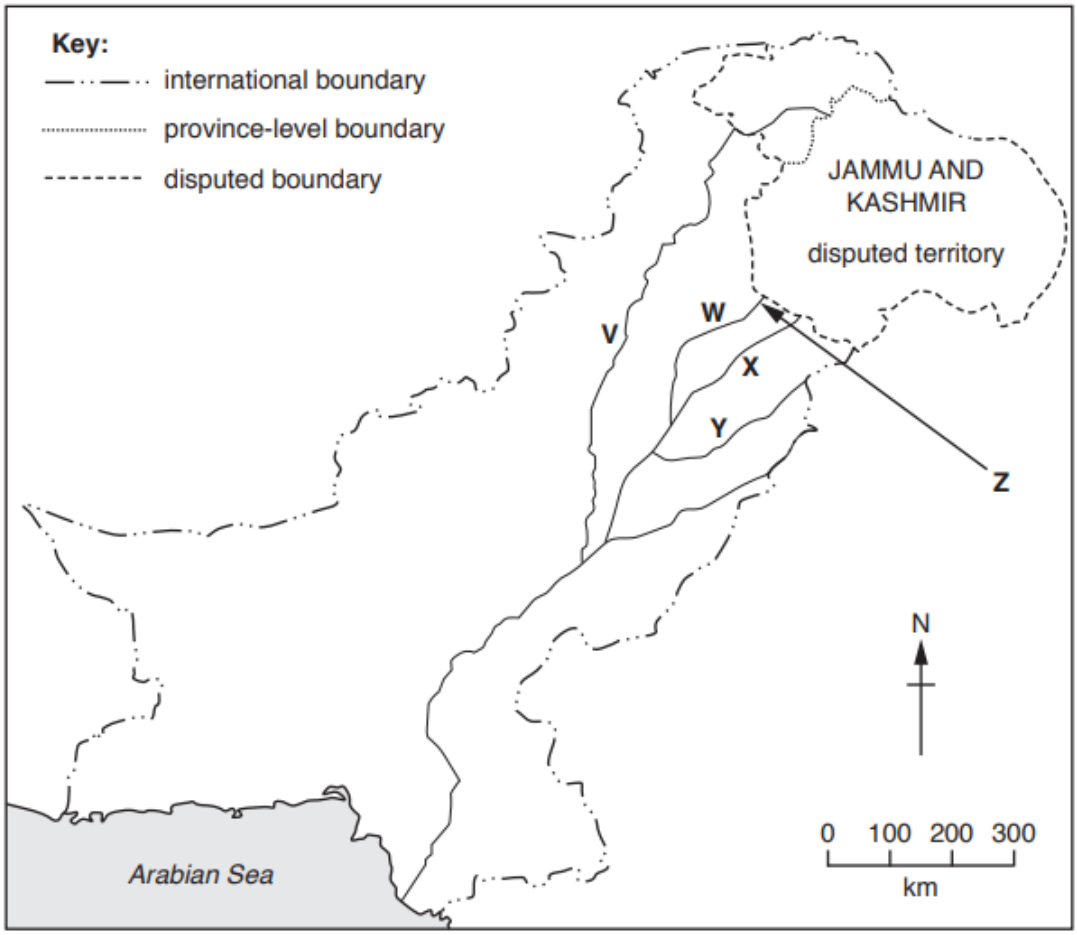

Fig. 2.1

(i) Name rivers **V**, **W**, **X** and **Y**.

V .....

W .....

X .....

Y .....

[4]

(ii) Name dam **Z** shown on Fig. 2.1.

Z .....

[1]

(b) (i) Name **two** examples of barrages.

1 .....

2 .....

[2]

(ii) State the differences between barrages and dams.

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..... [4]

(iii) Suggest **four** problems caused by siltation.

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..... [4]

(c) Explain why rivers are important to Pakistan. You should develop your answer.

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..... [4]

(d) Read the following two views about providing solutions to the challenges of water supply in Pakistan:

A

Small dams are the best way to solve water shortage problems and assist development.

B

Large dams are the best way to solve water shortage problems and assist development.

Which view do you agree with more? Give reasons to support your answer and refer to examples you have studied. You should consider View A **and** View B in your answer.

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ANSWER KEY

Practice Questions 1.1

Question 1 — J2017/P2/Q4/C(i-ii)

A Domestic
B 94% (allow 93–95%)

2 @ 1 mark

One of:
Beverages/soft drinks/juice industry/dyeing/tanning/printing/
iron/steel/nuclear/textiles/chemical/pharmaceutical/hydel/
HEP/paper/tourism/leisure/inland fish farms.

1 @ 1 mark

Question 2 — J2013/P2/Q2/D

(d) Study Fig. 3 which shows the main users of water in the Punjab.
Name two conflicting users of water supplies in the Punjab shown on Fig. 3. Explain briefly why each user thinks that they should have more water.

2 conflicting users (one mark), e.g. farmer, industrialist, home-owner, power industry

Reasons for wanting more water (two marks each)
e.g. farmer wants it for higher yields – more food for growing population, income for himself, irrigation, example of high usage, e.g. rice and sugarcane.
e.g. industrialist wants it for bigger/better output – increase trade, exports, income for himself, example of high usage, e.g. drinks, chemicals.
e.g. home owner wants it for domestic use – better hygiene, food preparation, healthy living, example of high usage, e.g. washing, drinking. **[5]**

Question 3 — N2006/P2/Q2/C

(c) (i) Why do the writers refer to Pakistan as a 'water-deficit country'?
insufficient rainfall
growing needs
(quote of second sentence 2 marks) **[2]**

(ii) Using examples, explain why there are conflicts over water availability and use.
Examples of conflicting users (max 2):
Farming v industry v domestic v food processing v HEP v other
India v Pakistan 1947 – 1960
NWFP and Punjab v Sindh
Development of Kalabagh dam
(1 mark for a pair of conflicting users)

Explanation:
Irrigation for more agriculture
Industrialisation – water for washing, cooling, processing
Hygiene - need to keep clean
Population growth – need for more
Electricity for modem technology
– because there is not enough (max 1)
(1 named user + their need = I mark)
(up to 3 uses can be credited) **[7]**

Practice Questions 1.2

Question 1 **N2014/P2/Q1/C**

(c) Explain the importance of the Indus Water Treaty to Pakistan. **[4]**

Ensures that India does not restrict Pakistan's water supply / water supply in Pakistan is maintained

Ensures an effective / dependable irrigation system in the Indus Plain
Pakistan has exclusive rights to waters of the rivers Indus, Jhelum, and Chenab

Maintains agricultural production
Tarbela and Mangla dams built [to store water]

Barrages / syphons / link canals built [to distribute water]
Enabled construction cost of works to be shared with Western countries and India

Practice Questions 1.3

Question 1 **J2011/P2/Q1/A(ii)**

(ii) What are the advantages and disadvantages of replacing this Persian Wheel with a tubewell. **[4]**

Advantages of tubewell (res. 1)
More efficient / faster / does not need to rest
For larger area / more water / goes deeper
Regular supply / can be used at any time of year / continuous
Less labour required
Cleaner water
Reduces waterlogging and salinity

Disadvantages of tubewell (res.1)
Expensive / cannot be used by poor farmers
Needs fuel /electricity / diesel etc.
Reduces groundwater / lowers water table (as a disadvantage)

Also accept the opposite response e.g. Persian Wheel is cheaper.

Practice Questions 1.4

Question 1 **N2012/P2/Q3/A**

(a) Study Fig. 4.

(i) Name the irrigation system shown in Fig. 4 **[1]**

Karez

(ii) Name an area of Pakistan where it is used. **[1]**

Balochistan
Kech Valley / Turbat /Miri / Sharak

(iii) Explain how this system provides water for agriculture in this area. **[4]**

rain falls in mountains
drains to the foothills / sinks into ground / groundwater /
travels in tunnels / underground canals
reaches surface / oases
tunnels need maintenance
owned by groups of farmers

(iv) Name a fruit crop grown in this area. **[1]**

dates / apricot / apple / grapes / peaches / melons

Practice Questions 1.5

Question 1 — J2011/P2/Q1/A(i)

(a) Study Photograph A of a Persian Wheel.

(i) With reference to the photograph, explain how this machine is used for water supply. **[3]**

Worked by animal or man power
Using wooden shaft / pole / log
Turns horizontal wheel / a wheel rotates
Which is attached to vertical wheel
With buckets / cups to raise water
Water goes into trough / pipe / channel

Practice Questions 1.6

Question 1 — N2014/P2/Q1/B

(b) What is meant by

A: a link canal
Diverts / transfers / moves water from / links barrages / syphons to rivers / canals
Diverts / transfers / moves water from / links [western] rivers to other [eastern] rivers / canals
Diverts / transfers / moves water between / links rivers / river and canal

B: a perennial canal
Supplies water throughout the year
Supplied from dams / barrages

C: an inundation canal? **[3]**
Supplies water in the rainy season
Taken from rivers / when rivers high / flood

Question 2 — J2013/P2/Q2/A,C

(a) Study Fig. 2 which shows the perennial canal system in Pakistan.
Describe the distribution of the perennial canals.

mainly on Plains/Indus Plain/by the rivers
most widespread in Punjab
only from Indus in Sindh

mostly NE to SW in Punjab and Upper Sindh
mostly NW to SE in Lower Sindh
south/east of highlands
no canals in SE area/Balochistan/north/west/mountains
some in KPK **[4]**

(c) Explain how a perennial supply of water can damage farmland.

too much water/waterlogging
watertable rises
evaporates
causes salinity/salts accumulate on surface/surface crust **[4]**

Question 3 N2005/P2/Q1/C(i)

(c) (i) What are perennial canals, and why are they better for farming than inundation canals?

What are they? (res. 1)

Canals that supply water throughout the year from dams/barrages

Why better? (res.1)

Water always available when needed
Can be better controlled
Reliable/do not depend on the weather
or credit the reverse for inundation canals

(res. 1) [for each of 'what' and 'why', float of 1] **[3]**

Practice Questions 1.7

Question 1 J2013/P2/Q2/B

(b) Name <u>three</u> types of irrigation, other than perennial canals, used in Pakistan. Explain briefly how each type works.

Allow one mark for a brief description and the second mark for more detail
inundation canals from rivers + details
tubewells from groundwater + details
Karez from foothills + details
others including ponds, tanks, charsa, shaduf and modern methods, e.g. sprinkler, tanker **[6]**

Practice Questions 1.8

Question 1 N2015/P2/Q1/B

(b) Study Fig. 1, a map showing the major rivers of Pakistan.

(i) Locate the following two dams on the map:
- **Warsak (W);**
- **Diamir Bhasha (under construction) (D). This dam is 150 km downstream of Gilgit.**

Mark their positions using the appropriate symbol from the key and label each with the correct letter. **[2]**

W On R. Kabul between confluence with R.Swat and Afghan border RED OVERLAY SHOWS TOLERANCE
D On R. Indus GREEN OVERLAY SHOWS TOLERANCE
Credit any indication of correct location on map within tolerated regions
1 + 1 mark

(ii) What are the advantages of building a dam at the Diamir Bhasha site? **[4]**

HEP
Electrification of/supplies electricity to the region/for local industries
Only floods agriculturally barren land/small amount agricultural land flooded
Will extend life of Tarbela Dam
Controls/reduces/prevents flooding [downstream]
For irrigation
Drinking water/water supply for industries
New transport infrastructure/development in region
Possibility of tourism/watersports
Possibility of freshwater fishing
Provides employment in named sector /for local people
Location factor e.g. narrow/steep-sided valley/high speed of water/high precipitation/large amount of meltwater from glaciers *'Flow' = 0*

(iii) Describe the disputes over water availability and use which can arise from proposals to build dams at sites such as this. **[4]**

One province receives greater share of water/unequal division of water
Dam in Punjab/one province but much of flooded area in Khyber Pakhtunkhwa/another province
Loss of water supply downstream/to Sindh for agriculture
Risk of flooding downstream by release of water/opening dam

Less silt deposited on floodplains of lower course/lower Indus
Evaporation of lower course/lower Indus
[Indus] delta/coastal area [of Sindh] less fresh water/water more saline
Disturbance to ecosystem/mangrove forests/fishing
NB: not limited to Kalabagh case study
'Loss of land'/'evacuation' = 0

Question 2 N2014/P2/Q1/A

(a) Study Fig. 1 which shows a map of Pakistan. Name:

(i) The rivers E, F, and G. **[3]**

E Indus

F Jhelum
G Ravi

(ii) <u>One</u> of the dams H <u>or</u> J. **[1]**

H Tarbela
J Mangla

Question 3 J2009/P2/Q1/A-B

(a) Study Photograph A (Insert) showing the Hanna Dam.

(i) Describe the site of the dam.
steep rock face/scar/cliff
bare rock/rocky/barren
deep valley } valley
narrow valley }
flatter/lower area/beach
side valley/tributary
scree/gravel/sand [3]

(ii) What evidence shows that the water level in the reservoir is low?
Dry ground/silt/scars at edge/beach/sand/flat land at edge [1]

Study Photograph B (Insert) showing the Balloki Barrage.

(b) Compare the barrage shown in Photograph B with the dam in Photograph A.
Barrage is:
longer/wider/less high
water on both sides
link canal
both have railings along top
low/flatter land [3]

Practice Questions 1.9

Question 1 J2014/P2/Q1/D

(d) Describe the ways in which damage by waterlogging and salinity can be prevented. [6]

- Tubewells to lower water table (fresh water pumped up to flush out salt)
- Surface drains dug (diverts surface water to river / lake)
- Canals lined (prevents seepage)
- Canals closed temporarily
- (Eucalyptus) trees planted (deep roots absorb water from water table)

Question 2 J2011/P2/Q1/D

(d) Explain why waterlogging and salinity of soils causes problems to farmers. [6]

Reduces cultivable area / makes land un-usable
Reduces yield / damages crops
Reduces income / profit
Expensive to reclaim land / treat soil

Reasons why this occurs
Water table rises / water collects on the surface / water on roots
Evaporation (caused by hot climate)
Fertilisers add to salts in water
Salts left behind / form a hard crust on surface
Soil becomes infertile / toxic
Farmers use too much water / poor farming methods
Perennial water supply / available all year

Question 3 N2007/P2/Q1/C

(c) (i) Why do problems of waterlogging and salinity occur in some irrigated areas? [3]

Waterlogging
Water available all year
Crops given more water than they use
Watertable rises/reaches surface

Salinity
Evaporation of water
Salt in irrigation water
Salts brought to surface
Unlined canals leak

(ii) How can these problems be overcome? [5]

Lowering water table	by tubewells
	trees
Control of water	by lining canals
	closing canals temporarily
	surface drains
Flushing out of salt	by water from tubewells
	surface drains
Education	to improve farming methods
Government schemes	SCARP, WAPDA

Question 4 N2006/P2/Q2/B

(b) Study Photograph B (Insert) showing an area in Hyderabad District damaged by waterlogging and salinity.

(i) Describe the appearance of the area S in Photograph B.

bare / no vegetation
cracks / cracked mud
pools of water
saline water
(mineral) salts
white / mustard colour
edged with black / grey **[3]**

(ii) What are perennial canals, and how may they lead to problems such as those in area S?

definition (*res.* 1)
canals that can supply water all year round
from reservoirs / barrages
via link canals

problems (*res.* 1)
too much irrigation water *leading to*
evaporation in hot, dry climate
rise of water table
rise of salts to surface **[4]**

(iii) How can these problems be reduced?

Lined canals to prevent infiltration
Culverts to drain excess water from canals
Surface drains to flush out salt from soil
Tubewells to lower water table
Eucalyptus trees plants to reduce water underground
SCARP - government programme + details *(max* 4)
WAPDA - to carry out projects + details *(max* 4)
(N.B. a good account of WAPDA or SCARP scheme could get 4 *marks)* **[4]**

Question 5 N2005/P2/Q1/C(ii-iii)

(ii) How may irrigation damage the soil?

Causes water-logging and salinity
Groundwater rises/swamps formed (max. 2)
Salts added to soil by groundwater
Evaporation leaves salts on surface
Hard crust formed
Soil not properly flushed out/shortage of canal water **[3]**

(iii) How may this damage be overcome?

Water-logged/wet soil (res.1)
Concrete linings to canals
Closure of canals when not needed/regulate flow
Planting trees eg. Eucalyptus
Tubewells used (instead of old methods)

Tubewells used to lower water table

Surface drains

Lower canal water levels/dredge silt

(res. 1) Salty/saline soil

Water from tubewells used to flush out salts

Education/knowledge of better farming methods

Use of fallow periods

[Some of these points refer to both water-logging and salinity, do not credit twice] **[6]**

Practice Questions 1.10

Question 1 — N2015/P2/Q1/A

(a) (i) Describe two ways in which water supplies can be polluted. **[2]**

Sewage discharged into rivers
Domestic waste thrown in rivers
Pesticides/fertilisers runoff from agricultural fields in groundwater/rivers/eutrophication
Industrial waste/chemicals/toxic waste/metals/ waste from ships discharged into rivers
Leakage of oil from ships
'Sea'/'ocean' = 0

(ii) For one of these ways explain how the problem caused by pollution can be solved. **[2]**

Investment in sewerage systems/ infrastructure/treatment of sewage
Improve sanitation facilities in poor quality housing/slums/squatter settlements /katchi abadis
Improve/more regular domestic refuse collection
Treatment of/improving disposal of industrial waste
Open up roads into squatter settlements to allow refuse lorries
Alternatives to chemical fertilisers/pesticides *'Reduce' = 0*
Organic farming
Fines for industrial polluters
More investment by industries to prevent pollution incidents
Maintenance of ship/checking for leaks in ship
If not clearly linked to candidate answer/different answer to (i) then max 1

Question 2 — J2011/P2/Q1/E

(e) Water pollution is a major problem in urban areas.
With reference to examples, explain some of the causes of this pollution, and why it is a major problem to the people who rely on this water supply. **[6]**

Causes (res. 1)

Explanation of	Human waste	e.g. because no sanitation / untreated sewage
	Industrial waste	e.g. dumping in rivers
	Litter / plastic/paper	e.g. because no organised collection
	Oil spills	e.g. from washing of tanks / ship breaking
	Agricultural runoff	e.g. because of use of chemicals / fertilisers and insecticides

Problems (res. 1)
Not for drinking / poisonous / contaminates groundwater
Cost of treatment
Causes disease
– risk of cholera, typhoid, diarrhoea , hepatitis, dysentery etc.
Not for food processing (e.g. fish canning)
Smells
Reduces fish catch / kills fish
Can damage machinery
Blocks ditches / canals / causes flooding
– risk of malaria from stagnant water

Question 3 N2008/P2/Q2/C

(c) Study Fig. 3 again.

(i) Locate one area of

A unsafe drinking water,
Makran coast/Gwadar district, SE Sindh, W Balochistan

B marine pollution.
Indus delta, Karachi, Korangi, Port Qasim [2]

(ii) Explain how industries can pollute river and sea water.
The answer must relate to water pollution
effluent/liquids }
dumping/solids } credit one example of each
sewage/garbage
e.g. dyeing and tanning (credit one example of a polluting industry except power station)
hot water from power stations
oil spills
accidents
etc. [4]

(iii) Explain how this pollution affects farming, fishing and wildlife.
contamination of sub-soil water and irrigation,
contamination of mangrove environment,
toxic chemicals cause mutation and death,
entering food chain,
oil kills seabirds
eutrphication reduces oxygen

N.B Not humans, no reserves [6]

Practice Questions 1.11

Question 1 J2017/P2/Q4/C(iii)

- Seepage from beds of canals/absorbed into the soil/land/no canal lining;
- Evaporation/evapotranspiration from surface of canals/tanks/flooded land;
- Excessive runoff of water immediately into streams/rivers;
- Theft of water/theft from canals;
- Water drawn up by vegetation on side of canal;
- Mismanagement.

3 @ 1 mark

Question 2 — J2009/P2/Q1/C

(c) Study Fig. 1, a graph showing the amount of water stored in the reservoir of the Hanna Dam.

(i) By how much did the amount of water decrease from 1974 to 2004?
0.45 million gallons/1.43 – 0.98 million gallons [1]

(ii) Suggest why the amount of water stored in the reservoir is decreasing.
Siltation/silting
Due to soil erosion/deforestation/overgrazing/river deposition
Less water supply
Due to climatic change/lower rainfall/higher temperatures/more evaporation
Increased usage (max 1) [2]

(iii) What can be done to stop the amount of water in the reservoir from reducing further?
Silt traps
Afforestation }
Terracing } of slopes
Dredging/removal of silt
Reducing wastage/pollution [3]

Practice Questions 1.12

Question 1 — J2013/P2/Q2/E

(e) To what extent is it possible to increase water supply in Pakistan?

Possibilities (res. 2)
Indus river system + details
rainfall in mountains
melt water from mountains
groundwater
flat land for canals
cleaning dirty water/desalination
reduce losses, e.g. more storage, less leakage, ration usage (max. 2)
control misuse, e.g. by education

Problems (res. 2)
not enough river water
not enough rain
loss by leakage, siltation
Indus Water Treaty restricts water in reservoirs/rivers
evaporation in hot climate
pollution
demands always increasing
some places remote (e.g. Baluchistan)
lack of funds/government will **[6]**

Question 2 — N2011/P2/Q5/D

(d) Consider the feasibility of improving water supply to farmers in Punjab and Sindh. [6]

In favour (res.1)
Rainfall in monsoon season can be stored
Snow melt from mountains
Indus river system brings water from highlands

Can make more storage / reservoirs / dams / barrages
Can build more canals
Can use groundwater / build more tubewells

Against (res. 1)
Cost of reservoirs, canals etc
Cost of tubewells
Lack of reservoirs / dams / barrages
Indus Treaty limits supply / conflict with India over supplies
Lower water table restricts groundwater
Waterlogging and salinity problems
Lack of / cost of power supplies for pumps
Other constraints, e.g. education, wastage, conflict between users etc.
Can be ruined by floods

Alternative approach
Improvements (res. 1)
More storage
More canals
Reduce waste / seepage / flooding
Clear silt / silt traps
Control water pollution
Modern technology, e.g. tubewells, sprinklers
Education of farmers
Plant trees for more rainfall

But (res. 1 mark)
Need for investment
Lack of training for farmers
Lack of water supply
Conflict with India

Question 3 J2011/P2/Q1/B-C

(b) Study Fig. 1 which shows canal water supply in Pakistan.

(i) In which year was the water supply highest? **[1]**

1999

(ii) How much higher was this than the supply in 2002? **[1]**

31 (million acre feet)

(c) Why is there not enough water supply from canals to meet the needs of all users? **[4]**

Shortage of rainfall
Evaporation
Less river water / restrictions by India / more dams on rivers
Problem of tail-enders / canal system does not reach all those who need it
Siltation in reservoirs / canals
Seepage / leakage from canals
Wastage by users / some use more than they need
Water pollution
High demand / variety of uses
Theft of water
Population increase
Lack of investment

Review Exercise

Question 1 J2017/P2/Q4/D

Levels marking

Level 1 (1–2 marks)
Simple point addressing any view (1).
Simple points addressing any view (2).

Level 2 (3–4 marks)
Developed point(s) explaining one view (3).
Developed point(s) explaining views (4).
No evaluation.

Level 3 (5–6 marks)
Developed points explaining both views. Evaluation giving clear support to one view or a named example (5).
Developed points explaining both views. Evaluation giving clear support to one view and a named example (6).

Content Guide:

Answers are likely to refer to:

For infrastructure
- Prevents loss of water downstream into sea
- Collects rainfall/snowmelt
- Reservoirs feed perennial canals
- Can store large amounts of water

Against infrastructure
- Source of conflict between countries and provinces
- Social issues
- Loss of fresh water at Indus Delta
- Water intrusion into Sindh
- High initial investment
- Little use in Balochistan where rivers dry up
- Mismanagement by provincial/national government
- Siltation occurs

For water saving
- Planting trees
- Lining canals
- Careful monitoring/regulation of amount of water used
- Better forms of water storage in homes
- Water meters in homes/industries

Against water saving
- Long time scale required to educate sufficient number of people
- Resistance to education
- Water a valuable raw material in industry
- Growing population with increasing demand for drinking water
- Development goal to increase availability of water

ETC.

Question 2 N2009/P2/Q1/E

(e) Read Fig. 3, an extract from a magazine.

> **Most farmers in Balochistan do not have access to water from the River Indus.**
> **There are many small rivers that flow into shallow lakes but they are dry for most of the year. These small rivers can provide some water for irrigation.**
> **Other sources of water are underground, and some water flows in tunnels from the mountains.**
>
> ***Irrigation News***

Describe the irrigation methods that can be used by farmers in Balochistan and comment on the success of such schemes for increasing farming output. [6]

The candidate is expected to describe, and possibly illustrate at least 2 of the following schemes.

Maximum 4 marks on any one scheme, but 1 mark must comment on 'success'.
Reserve 2 marks for 'success of schemes.
Credit labels on diagrams if not in script.
Allow one named or located example of each scheme.

Karez
canals from rivers/diversion canals
tubewells
wells (primitive)
shaduf to lift water
charsa to lift water
Persian Wheel to lift water
tanks for storage
dams (small)

For Example – The Karez

underground canal/tunnel
uses groundwater
vertical shafts for cleaning
water taken in turn according to shares in ownership
irrigates oases
Example – Quetta-Pishun valley, Mastung valley

Success – less important now, neglected – bad
sources drying up – bad
lack of government investment – bad

continuous supply – good
only water in the desert – good
water from mountains put to good use – good
does not evaporate – good
etc.

Recent Past Paper Questions

Question 1 N2019/P2/Q2

V = Indus
W= Jhelum
X = Chenab
Y = Ravi

4 @ 1 mark

Z= Mangla Dam

1 @ 1 mark

- Amandarra
- Balochi
- Chasma
- Guddu
- Islam
- Jinnah
- Kotri
- Kurrangarhi
- Marala
- Panjnad
- Qadirabad
- Rasul
- Siddha
- Sukkur
- Sulaimanka
- Taunsa
- Trimma

2 @ 1 mark

- Dams store water / barrages control flow of water;
- Barrages can supply little / small amounts / no electricity (dams are major suppliers of hydel power);
- Silting is a problem for dams (but not barrages);
- Maintenance cost is lower for barrages (more expensive for dams);
- Construction and or maintenance time is quicker for barrages (longer for dams);
- Construction cost is lower for barrages (more expensive for dams);
- Fewer or no people have to be evacuated for barrages;
- Barrages have less environmental impact than dams;
- Barrages can be built on flat land (dams require steep slopes);
- Dams have multiple uses whereas barrages do not;
- Dams provide water for a larger area than barrages;
- Barrage to deviate channel to an area where there is no river;
- Do not need to excavate a large area for barrages.

4 @ 1 mark

- Reducing water supply / less water available / water becomes silty / pipes blocked / reduces capacity of reservoir / less water stored;
- Blocking the flow of water / blocks canals or rivers / chokes or blocks irrigation canals or pipes / water cannot get through / floods may occur;
- Weakens foundations of dams / have to be emptied or strengthened / flow of flood water is hampered and can damage dam / damage to turbines or machinery;
- Not enough water for irrigation / industry / domestic use;
- Reduces water available for hydel power / generation of hydel power stopped;
- Encourages growth of algae / eutrophication.

- Scenic beauty; for tourism / picnic / leisure (dev);
- Provides water; especially to areas where rainfall is low/named; examples / sustains life or drinking water (dev);
- Helps to generate hydel power / electricity; which reduces power shortages / reduces need to import coal or oil / reduces need to use fossil fuels (dev) / one of main sources of electricity;
- Adds alluvium to soil; so, improves the fertility of the soil / aids crop growth (dev);
- For fishing industry / subsistence fishing; provides income or food supply to local areas / people (dev);
- Provides water for domestic use / in the home; named examples, e.g. cooking / cleaning (dev);
- Provides water for industries; named examples, e.g. cement, brick making, cotton (dev);
- Provides water for irrigation / agriculture / farming; used to irrigate / water crops / feed livestock / or named examples, e.g. wheat / cotton / sugar cane (dev);
- Transport; for trade / avoid using roads or rail / access to ports (dev);

Etc.

Note: One mark for identification of appropriate idea and a further mark for development (in parentheses).

Note: Max. 2 marks if no development.

2 @ 2 marks

Levels marking

No valid response 0

Level 1 1–2
Simple point referring to one view (1)
Simple points referring to any view (2)

Level 2 3–4
Developed point referring to one view (3)
Developed points referring to both views (4)

Level 3 5–6
Developed points referring to both views with evaluation or relevant example (5)
Developed points referring to both views with evaluation and relevant example (6)

Content Guide
Answers are likely to refer to:

Small dams
- Cheaper to construct;
- Less technical expertise needed;
- Can be built more quickly;
- Minimal disruption to people and environment;

Etc.

Large dams
- More people will benefit;
- Can produce HEP which is good for developing the country;
- Provides employment opportunities;
- A bigger area is utilized;

Etc.