

tpo_12_passage_3

Rainfall is not completely absent in desert areas, but it is highly variable. An annual rainfall of four inches is often used to define the limits of a desert. The impact of rainfall upon the surface water and groundwater resources of the desert is greatly influenced by landforms. Flats and depressions where water can collect are common features, but they make up only a small part of the landscape. Arid lands, surprisingly, contain some of the world's largest river systems, such as the Murray-Darling in Australia, the Rio Grande in North America, the Indus in Asia, and the Nile in Africa. These rivers and river systems are known as "exogenous" because their sources lie outside the arid zone. They are vital for sustaining life in some of the driest parts of the world. For centuries, the annual floods of the Nile, Tigris, and Euphrates, for example, have brought fertile silts and water to the inhabitants of their lower valleys. Today, river discharges are increasingly controlled by human intervention, creating a need for international river-basin agreements. The filling of the Ataturk and other dams in Turkey has drastically reduced flows in the Euphrates, with potentially serious consequences for Syria and Iraq. The flow of exogenous rivers varies with the season. The desert sections of long rivers respond several months after rain has fallen outside the desert, so that peak flows may be in the dry season. This is useful for irrigation, but the high temperatures, low humidities, and different day lengths of the dry season, compared to the normal growing season, can present difficulties with some crops. Regularly flowing rivers and streams that originate within arid lands are known as "endogenous." These are generally fed by groundwater springs, and many issue from limestone massifs, such as the Atlas Mountains in Morocco. Basaltic rocks also support springs, notably at the Jabal Al-Arab on the Jordan-Syria border. Endogenous rivers often do not reach the sea but drain into inland basins, where the water evaporates or is lost in the ground. Most desert streambeds are normally dry, but they occasionally receive large flows of water and sediment. Deserts contain large amounts of groundwater when compared to the amounts they hold in surface stores such as lakes and rivers. But only a small fraction of groundwater enters the hydrological cycle-feeding the flows of streams, maintaining lake levels, and being recharged (or refilled) through surface flows and rainwater. In recent years, groundwater has become an increasingly important source of freshwater for desert dwellers. The United Nations Environment Programme and the World Bank have funded attempts to survey the groundwater resources of arid lands and to develop appropriate extraction techniques. Such programs are much needed because in many arid lands there is only a vague idea of the extent of groundwater resources. It is known, however, that the distribution of groundwater is uneven, and that much of it lies at great depths. Groundwater is stored in the pore spaces and joints of rocks and unconsolidated (unsolidified) sediments or in the openings widened through fractures and weathering. The water-saturated rock or sediment is known as an "aquifer". Because they are porous, sedimentary rocks, such as sandstones and conglomerates, are important potential sources of groundwater. Large quantities of water may also be stored in limestones when joints and cracks have been enlarged to form cavities. Most limestone and sandstone aquifers are deep and extensive but may contain groundwaters that are not being recharged. Most shallow aquifers in sand and gravel deposits produce lower yields, but they can be rapidly recharged. Some deep aquifers are known as "fossil" waters. The term "fossil" describes water that has been present for several thousand years. These aquifers became saturated more than 10,000

years ago and are no longer being recharged. Water does not remain immobile in an aquifer but can seep out at springs or leak into other aquifers. The rate of movement may be very slow: in the Indus plain, the movement of saline (salty) groundwaters has still not reached equilibrium after 70 years of being tapped. The mineral content of groundwater normally increases with the depth, but even quite shallow aquifers can be highly saline.

question 1

Which of the following statements about annual rainfall can be inferred from paragraph 1?

A Flat desert areas receive more annual rainfall than desert areas with mountains.

B Areas that receive more than four inches of rain per year are not considered deserts.

C Many areas receive less than four inches of annual rainfall, but only a few are deserts.

D Annual rainfall has no impact on the groundwater resources of desert areas.

question 2

The word "drastically" in the passage is closest in meaning to

A obviously

B unfortunately

C rapidly

D severely

question 3

In paragraph 2, why does the author mention the Ataturk and other dams in Turkey?

A To contrast the Euphrates River with other exogenous rivers

B To illustrate the technological advances in dam building

C To argue that dams should not be built on the Euphrates River

D To support the idea that international river-basin agreements are needed

question 4

According to paragraph 2, which of the following is true of the Nile River?

A The Nile's flow in its desert sections is at its lowest during the dry season

B The Nile's sources are located in one of the most arid zones of the world

C The Nile's annual floods bring fertile silts and water to its lower valley

D The Nile's periodic flooding hinders the growth of some crops

question 5

Paragraph 5 supports all of the following statements about the groundwater in deserts EXCEPT:

A The groundwater is consistently found just below the surface

B A small part of the groundwater helps maintain lake levels

C Most of the groundwater is not recharged through surface water

D The groundwater is increasingly used as a source of freshwater

question 6

According to paragraph 6, which of the following statements about aquifers in deserts is true?

A Water from limestone and sandstone aquifers is generally better to drink than water from sand and gravel aquifers

B Sand and gravel aquifers tend to contain less groundwater than limestone or sandstone aquifers

C Groundwater in deep aquifers is more likely to be recharged than groundwater in shallow aquifers

D Sedimentary rocks, because they are porous, are not capable of storing large amounts of groundwater

question 7

According to paragraph 6, the aquifers called fossil waters

A contain fossils that are thousands of years old

B took more than 10,000 years to become saturated with water

C have not gained or lost any water for thousands of years

D have been collecting water for the past 10,000 years

question 8

The passage supports which of the following statements about water in the desert?

A The most visible forms of water are not the most widespread forms of water in the desert.

B Groundwater in the desert cannot become a source of drinking water but can be used for irrigation.

C Most of the water in the desert is contained in shallow aquifers that are being rapidly recharged.

D Desert areas that lack endogenous or exogenous rivers and streams cannot support life.

question 9

Look at the four squares [] that indicate where the following sentence could be added to the passage. Where would the sentence best fit?

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collect are common features, but they make up only a small part of the landscape. Arid lands, surprisingly, contain some of the world's largest river systems, such as the Murray-Darling in Australia, the Rio Grande in North America, the Indus in Asia, and the Nile in Africa. These rivers and river systems are known as "exogenous" because their sources lie outside the arid zone. They are vital for sustaining life in some of the driest parts of the world. For centuries, the annual floods of the Nile, Tigris, and Euphrates, for example, have brought fertile silts and water to the inhabitants of their lower valleys. Today, river discharges are increasingly controlled by human intervention, creating a need for international river-basin agreements. The filling of the Ataturk and other dams in Turkey has drastically reduced flows in the Euphrates, with potentially serious consequences for Syria and Iraq. The flow of exogenous rivers varies with the season. The desert sections of long rivers respond several months after rain has fallen outside the desert, so that peak flows may be in the dry season. This is useful for irrigation, but the high temperatures, low humidities, and different day lengths of the dry season, compared to the normal growing season, can present difficulties with some crops. Regularly flowing rivers and streams that originate within arid lands are known as "endogenous." These are generally fed by groundwater springs, and many issue from limestone massifs, such as the Atlas Mountains in Morocco. Basaltic rocks also support springs, notably at the Jabal Al-Arab on the Jordan-Syria border. [] Endogenous rivers often do not reach the sea but drain into inland basins, where the water evaporates or is lost in the ground. [] Most desert streambeds are normally dry, but they occasionally receive large flows of water and sediment. [] Deserts contain large amounts of groundwater when compared to the amounts they hold in surface stores such as lakes and rivers. [] But only a small fraction of groundwater enters the hydrological cycle-feeding the flows of streams, maintaining lake levels, and being recharged (or refilled) through surface flows and rainwater. In recent years, groundwater has become an increasingly important source of freshwater for desert dwellers. The United Nations Environment Programme and the World Bank have funded attempts to survey the groundwater resources of arid lands and to develop appropriate extraction techniques. Such programs are much needed because in many arid lands there is only a vague idea of the extent of groundwater resources. It is known, however, that the distribution of groundwater is uneven, and that much of it lies at great depths. Groundwater is stored in the pore spaces and joints of rocks and unconsolidated (unsolidified) sediments or in the openings widened through fractures and weathering. The water-saturated rock or sediment is known as an "aquifer". Because they are porous, sedimentary rocks, such as sandstones and conglomerates, are important potential sources of groundwater. Large quantities of water may also be stored in limestones when joints and cracks have been enlarged to form cavities. Most limestone and sandstone aquifers are deep and extensive but may contain groundwaters that are not being recharged. Most shallow aquifers in sand and gravel deposits produce lower yields, but they can be rapidly recharged. Some deep aquifers are known as "fossil" waters. The term "fossil" describes water that has been present for several thousand years. These aquifers became saturated more than 10,000 years ago and are no longer being recharged. Water does not remain immobile in an aquifer but can seep out at springs or leak into other aquifers. The rate of movement may be very slow: in the Indus plain, the movement of saline (salty) groundwaters has still not reached equilibrium after 70 years of being tapped. The mineral content of groundwater normally increases with the depth, but even quite shallow aquifers can be highly saline.

question 10

Directions: Select from the seven sentences below, the two sentences that correctly characterize endogenous rivers and the three sentences that correctly characterize exogenous rivers. Drag each sentence you select into the appropriate column of the table. Two of the sentences will NOT be used. This question is worth 3 points.

- A. Their water generally comes from groundwater springs.
- B. Their water is saltier than the water of most other rivers.
- C. They include some of the world's largest rivers.
- D. They originate outside the desert.
- E. They often drain into inland basins and do not reach the sea.
- F. They contain too much silt to be useful for irrigation.
- G. Their water flow generally varies with the season of the year.