

Geography Model Answers

Q. Discuss the endogenous elements that contribute to the creation of volcanoes with the aid of suitable examples.

Students are expected to provide a thorough overview of the endogenous elements that contribute to the creation of volcanoes along with pertinent examples.

Introduction:

Endogenic forces are those movements that are caused by forces that originate from the earth's core. The contraction and expansion of rocks as a result of changes in thermal conditions and temperature within the earth is what gives rise to endogenic force. Many landforms were created as a result of these processes, including volcanoes.

Body:

Volcano formation-related endogenic factors:

Earth's interior heat is the primary energy source for the forces that propel endogenic processes.

Diastrophic motions and abrupt movements are two categories of endogenic movements.

According to plate tectonics, most volcanoes form when two lithospheric plates collide and one of them slides over the other, pushing the other plate deep into the mantle where it will be reabsorbed.

Ocean floor spreading: Along the axis of the oceanic ridge system, where the plates move apart on both sides of the ridge and magma wells up from the mantle, is a significant site of active volcanism.

Weak Earth Surface: Because of high pressure in the earth's interior, the magma and gases escape with great velocity as the pressure is released through eruptions where opportunity is provided by weak zones along the earth's surface.

Faults: Whenever extreme pressure builds in the mantle, along fault lines an eruption is likely to happen next. The earthquakes, for instance, may expose fault zones through which magma may escape and volcanoes can be formed.

Magma crystallization: Decreasing temperatures can cause old magma to crystallize and sink to the bottom of the chamber and this movement can force fresh liquid magma up and out – similar to dropping a brick in a bucket of water.

Plate movement: Volcanism may occur because of plate movement over a "hot spot" from which magmas can penetrate to the surface. e.g. Islands of Hawaii

(Please do not write anything except the question number in this space)

Conclusion:

It is due to these endogenic elements that volcanoes arise. Volcanoes are further categorised as Active, Dormant, and Extinct depending on their level of activity. Volcanoes not only serve a significant role by cooling the majority of the planet, but they also provide ash and lava, which breaks down to create soil and minerals.

(Please don't write anything in this space)

(Please do not write anything except the question number in this space)

Q. How are different regions of the world affected by changes in the Asian Monsoon's patterns? Provide an explanation using current examples.

Candidates are expected to explain in detail how changes in the Asian monsoon pattern have affected different regions of the world using relevant, current instances.

Introduction:

One of the strongest meteorological occurrences on Earth and one of the most significant for society is the Asian monsoon. Important seasonal rainstorms that water crops and forests as well as destructive typhoons and floods are all caused by the monsoon.

Body:

80%–85% of the annual rainfall in the afflicted areas, which frequently amounts to 1.5–2.5 metres, occurs during the summer monsoon season.

On longer timescales, scientists have frequently pointed to the millions of years of evolution of this seasonal wind flow as a major factor in past changes to the environments, biosphere, and oceanography of this region, which includes the Indian subcontinent, Southeast Asia, China, Korea, and Japan. The Asian Monsoon pattern has changed in the ways listed below:

Since 1976, when there has been a regime change in climate around the world - from a weak to a strong El Nio phase, the monsoon has been delayed practically every year.

The length of the rainy season has decreased as a result of the monsoons ending about a week earlier than they used to - at the end of September.

There are frequently sporadic "break times" throughout the monsoon season when little rain falls. Systems departing the equatorial region and heading north are responsible for these times. The length of the "active periods" when it does rain is getting shorter as a result of global warming, while the break periods are getting longer, according to all available data and models-blended-with-data (known as reanalysis).

Impact of altered Asian monsoon patterns on different regions of the world:

The Indian monsoon is regarded as a well-defined "textbook phenomena" that hasn't changed much over the past century.

Unfortunately, this process has encountered an inconsistent front, with floods in the northwest and northeast and a lack of rainfall in the country's south.

Over the past few years, rainfall extremes have grown tenfold and now cover the entirety of central India, from Gujarat to Odisha.

Since 2002, the monsoon has started later each year and lasts for a shorter amount of time, compressing the Indian monsoon.

(Please don't write anything in this space)

(Please do not write anything except the question number in this space)

As a result of more frequent pauses in the monsoon, the monsoon itself has longer, drier periods.

In the last 10 or two years, there has been a dramatic change in rainfall intensity, duration, frequency, and spatial distribution.

In many areas of India, cycles of drought and flooding have increased in frequency, and their severity has shifted over time. Consider Cyclone Amphan.

Moreover, cyclones are also beginning to hit the countries' western coasts. Consider Cyclone Vayu.

Areas that have traditionally received plenty of rainfall are often remaining dry, while places that are not expected to get a lot of monsoon rain have sometimes been getting flooded.

The intensity and amount of rainfall over the region has increased drastically. For instance, Typhoon Kammuri in Phillipines and Flooding in parts of China.

The agricultural cycle of sowing to harvesting is facing tremendous challenge as unprecedented breaks and excess rainfall in short period of time making difficulty to set sowing pattern.

Many of the metro cities are receiving excessive rainfall as compared to their average normal. e.g. Recent flooding in Mumbai.

Also some experts opined that Australian bushfires partly due to late monsoon ending in India.

The lack of water in other areas has hit water table levels. By 2030, India is expected to require almost 1.5 trillion m³ of ground water, where the current supply is only 740 billion m³, putting a huge pressure on the river basins, which are facing challenges of their own due to fast-disappearing glaciers and reduced rainfall.

In recent times it is proved that monsoons are (nearly) unpredictable natural disasters. Hence, following steps are needed to tackle this crisis:

Need to change crop cycles, credit cycles, create storage infrastructure to deal with flooding.

We need to invest in developing the state of the art technology to predict the accurate data regarding the monsoon cycle.

Also, we need modification in the approach of handling of disasters by NDRF and SDRF as the intensity of the rainfall is extreme in some cases.

Change in the type and variety of crops and change in the kind of inputs used by farmers to deal with the altered reality is needed of the hour.

(Please don't write anything in this space)

(Please do not write anything except the question number in this space)

Conclusion:

The impact of the monsoon cycle changing on various regions of the world is significant. But, using cutting-edge technology and spending more on study to understand how the Asian monsoon is changing would undoubtedly assist to properly address this situation and prevent any losses in the future.

(Please don't write anything in this space)