

Earthquakes and Volcanoes | Sample Answer

Discuss the positive impacts of volcanoes (2018 Q1)

Volcanoes occur when molten magma forces its way up through a vent or fissure to the surface. The rising magma causes gas bubbles to expand, forcing the magma upwards. When the magma reaches the surface it releases pressure causing a volcanic eruption. Volcanoes have many positive effects. Volcanoes result in lava soils forming. These soils are rich in iron and are ideal for coffee growing e.g. The Deccan Plateau in India.

Volcanoes cause the formation of new volcanic islands e.g. The Hawaiian Islands. These are formed due to the Hawaiian hotspot. A hotspot occurs when there is tectonic activity in the middle of plates and high temperatures in the mantle causing a fountain of rising rock. A magma column rises from the hotspot and erupts through the plate. As the plate moves, magma rises up through fissures in the crust causing a volcano. The Hawaiian hotspot is located 3,200km from the closest plate boundary in the centre of the Pacific plate. As the Pacific plate passes over the hotspot, it causes a volcano. The Hawaiian hotspot is 500-600km wide, 100km below sea level, and it is 86 million years old. The formation of new volcanic islands is positive because, as volcanoes age they may become extinct, so these new islands would be safe for human settlement, therefore preventing homelessness.

Another positive impact of volcanoes is tourism. In Iceland and Yellowstone National Park, geysers are present which attracts tourists from many different countries. The most famous geyser at Yellowstone National Park is called 'Old Faithful'. In Iceland, medicinal tourism is also becoming much more popular. The 'Blue lagoon' heated thermal pool is linked to relieving illnesses such as arthritis, and attracts 2.3 million visitors annually.

Another positive effect of volcanoes is the production of geothermal energy in Iceland. Geothermal energy is captured when magma heats the ground 1 kilometre below the earth's surface. Precipitation seeps 3km down to the bedrock. The precipitation is heated to 380 degrees Celsius, causing a steam vent and a hot spring. Boreholes are drilled and the hot water is obtained as it turns to steam on the surface. The water then turns turbines which produce electricity. There are many benefits of geothermal energy for Iceland. In winter, it allows the country to have ice-free pavements due to underfloor heating. Geothermal energy also has the potential to be exported as there are plans to lay 1,300km of pipelines from Iceland to Scotland, which would benefit the economy in Iceland. Also, geothermal energy provides 30% of the nation's energy, with the potential to reach 40% in the coming years.