Volcano and its Types

Why in News?

Lava flows from a volcano in Iceland were slowing down recently, although new vents could open at short notice, according to the Icelandic Meteorological Office.

What are volcanoes?

- According to the US Geological Survey, volcanoes are ***openings, or vents*** where lava, tephra (small rocks), and steam erupt onto the Earth's surface.

- **Occurrence –** It can be on land and in the ocean in Earth.
- Scientific evidences also show their presence in other planets like Mars and Venus.
- **Formation –** They are formed when material significantly hotter than its surroundings is erupted onto the surface of the Earth.
- **Earth Core –** Earth's interior has outer crust, middle mantle and inner core layer.
- Mantle is denser than that of the crust and contains a weaker zone called asthenosphere from which the molten rock materials find their way to the surface.
- Liquid rock is known as magma when it is underground and called as lava when it breaks through the surface.
- **3 ways of magma rise**
    1. **Divergence of tectonic plates –** Here, the magma rises up to fill in the space and when this happens underwater volcanoes can form.
    2. **Convergence of tectonic plates –** When this happens, part of Earth's crust can be forced deep into its interior, which under high heat and pressure melts, and rise as magma.
    3. **At hotspots –** They are hot areas inside of the Earth, where magma gets heated up and it becomes less dense, leading to its rise.

*The **Pacific Ring of Fire** includes New Zealand, Southeast Asia, Japan and the western coast of the Americas, is a region in which about 90% of all earthquakes worldwide strike.*

- **Erupted material –** It includes lava flows, pyroclastic debris, volcanic bombs, ash and dust and gases (nitrogen, sulphur and minor amounts of chlorene, hydrogen and argon).

What are the different types of volcanoes?

- According to the British Geological Survey, the type of volcano depends
    - On the viscosity of the magma

    - On the amount of gas in the magma
    - On the composition of the magma
    - On the way the magma reaches the surface
    - On basis of their activity – Active dormant and extinct
- **Shield Volcanoes** – They form very large, gently sloped volcanoes with a wide base. Example: Mauna Loa in Hawaii.
- **Cinder cones** – They are the smallest volcanic landform, formed from accumulation of many small fragments of ejected material.
- **Composite Volcanoes (Stratovolcanoes)** – They are characterised by eruptions of cooler and more viscous lavas than basalt and have steep sides and are more cone-shaped than shield volcanoes.
- **Caldera** – These are the most explosive of the earth's volcanoes.
- When they erupt, they collapse on themselves rather than building and this collapsed depressions are called calderas.
- **Flood Basalt Provinces** - They outpour highly fluid lava that flows for long distances. Example: The Deccan Traps from India.
- **Mid-Ocean Ridge Volcanoes** – They occur in the oceanic areas where the central portion of this ridge experiences frequent eruptions.



- Active volcano – It is called so if the materials mentioned are being released or have been released out in the recent past.
    - ***Iceland***, a volcanically active regions on the Earth witnesses an eruption every 4 to 5 years but since 2021, it has spiked to almost 1 eruption per year.

What are impacts of volcanic eruptions?

- **Advantages** – They help to *stabilize the heat of the core* part of our planet.
- They *form new land forms* after the drying process of liquid lava.
- The lava contains different minerals which *enriches the existing soil*.
- It lead to the formation of geysers which are *sources of geothermal electricity* which help in domestic and industrial use.
- It facilitate *moderation of climate and receive higher rainfall* than flat areas.
- **Disadvantages** - It leads to lot of *destruction to life and property*.
- It can *create other natural hazards* like Tsunami.
- It can produce *harmful gases* and the lava heat act as a *booster for the global warming*.
- The lava flow often *cause wild fire* in the nearby forestlands.

References

1. The Indian Express| Volcanoes and its types
2. The Indian Express| The activeness of volcano



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