

1. With the help of suitable examples, discuss the correlation between continental drift and the distribution of species.

Approach

Candidates need to write and explain the economic of scale with production of goods point of view. And with suitable example discuss how it affect the location of the industry.

Introduction

According to Wegener's Continental Drift theory, all the continents were one single continental mass (called a Super Continent) – Pangaea and a Mega Ocean surrounded this supercontinent. The mega ocean is known by the name Panthalassa.

Body

Correlation between continental drift and distribution of species:

- Fossils of plants discovered on different continents helped to Wegener push his case that the continents were once locked together before breaking up and drifting away. For example Glossopteris.
- Glossopteris was Fossil from fern. It is a fern that was discovered in Africa, South America, Antarctica, India, and Australia.
- There are three families of cycad are widely distributed throughout tropical and temperate continents of the world. Prior to the theory of continental drift, the widely scattered distribution of present-day cycads in Australia, South Africa, Malaysia and the Americas was an enigma.
- There are more than 100 species of coral trees, mostly found in Mexico, Central and South America, and Africa. It is doubtful that corals existed when Africa and South America were connected.
- During continental drift plant species must have evolved or gone extinct because of climate change.
- Continent moving towards pole will get less sunlight and less photosynthesis means less temperatures and less vegetation. Whereas continent moving towards the equator will generate high vegetation with high warmer climate.
- Continent drift had changed the size and topography of the continent due to which land masses get impacted by ocean circulation patterns and general circulation of atmosphere.
- These dynamic structures encouraged the relocation of the focal point of plant species diversity.

Conclusion

The theory of continental drift can be used to provide a simplified explanation of the global distribution of plant, their evolution and provide a background. There is also more research needed to study other abiotic factors in relation to plant species diversity.

2. What is seafloor spreading? How does it occur? What are the landforms and features associated with seafloor spreading? Discuss.

Approach

Students are expected to write about the fintech industry and discuss the location factors affecting the it.

Introduction

Sea floor spreading theory was given by Harry Hess. The theory states that in the middle of ocean, the oceanic plates are moving away from each other in the middle of the oceans. Whereas, at the oceanic continental plate boundary, the oceanic plate gets sub ducted under the continental plate.

Body

Forces that cause Seafloor spreading

- Convectonal current theory which was proposed by Arthur Holmes addresses the forces which cause the sea floor spreading.
- According to Holmes the heat which is generated from the radioactive decay of substances deep inside the Earth (the mantle) creates magma which consists of molten rocks, volatiles, dissolved gases among other material.
- Further this magma, heat and gases seek a path to escape which leads to the formation of convection currents in the mantle.
- According to the theory of Seafloor spreading, convectonal cells are the force behind drifting of continents thus these conventional cells are explained by convectonal current theory of Holmes
- These ocean plates get subducted under the continental plates (since ocean plates are denser than continental plates), when these two types of plates converge.

Landforms and features associated with sea floor spreading:

- Rocks on either side of the crest of oceanic ridges having equidistant locations from the crest were found to have similarities both in terms of their constituents, their age and magnetic orientation.
- Rocks closer to the mid-oceanic ridges have normal polarity and are the youngest and the age of the rocks increases as one moves away from the crest (ridge).
- The rocks of the oceanic crust near the oceanic ridges are much younger than the rocks of the continental crust.
- Geophysical formations- various phenomenon mentioned above causes geophysical formations on sea bed such as sea mount, guyots, young fold mountains or deep trenches are formed at the boundary of oceanic continental plates.

Conclusion

Geographers have combined the knowledge from Plate tectonic theory, Sea floor spreading theory as well as continental drift theory to explain the formation of various physical features and geological processes on earth. Further these theories combined with modern technological advancements have helped humankind to predict various disasters more efficiently and save lives this making lives more secure and economy resilient.

3. What is a hailstorm? How does it occur? Explain.

Approach-

Candidates need to explain the hailstorm and how it occurs.

Introduction:

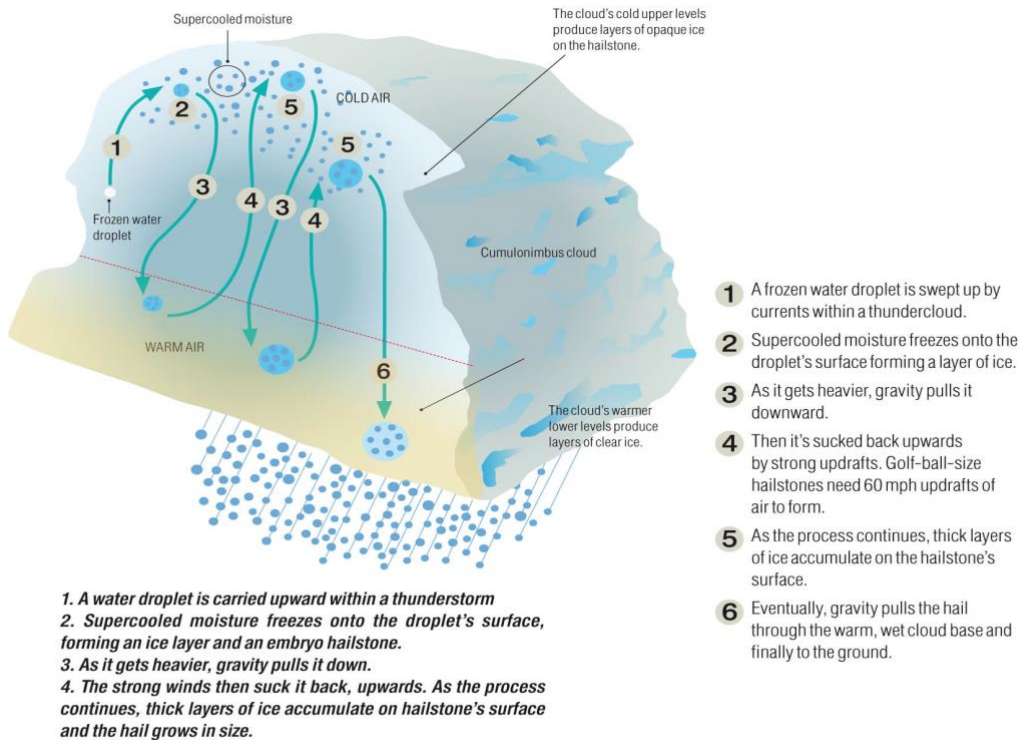
In the last decade, India has been repeatedly battered by different extreme events like heavy rainfall causing extensive flooding, droughts, unseasonal rainfall, hailstorm etc. The number of extreme events of very heavy rainfall has almost doubled in the country in the last 50 years. Among other extreme events unseasonal rains and hailstorms are mostly observed during pre-monsoon season from March to April in the country. The unseasonal rains and hailstorms have destroyed crops in lakhs of acres of farmland in many states including Himachal Pradesh, Uttar Pradesh, Uttarakhand, Punjab, Haryana, Madhya Pradesh, Gujarat, Rajasthan, Maharashtra and Andhra Pradesh causing huge losses to farmers.

What is a hailstorm?

- Hailstorm is a severe weather phenomenon, which causes extensive damage to crops, property and livestock. It is a thunderstorm that produces ice as precipitation.
- Hailstorms can cause serious damage to aircraft, automobiles, glass-roofed structures, skylights, besides crops, property, people and livestock.
- Hail is solid precipitation made of balls or irregular lumps of ice, each of which is called a hailstone.
- Unlike graupel or snow-ice pellets that are smaller and translucent, hailstones consist mostly of water ice and measure between 5 mm and 15 cm in diameter.
- Any thunderstorm, which produces hail that reaches the ground, is termed a hailstorm.
- In India, hailstorms mostly affect the northeast and western Himalayas, with the maximum strikes in March and April.

Occurrence of hailstorm:

- A hailstone begins as a water droplet that is swept up by an updraft inside of a thundercloud. Inside the cloud, there are a large number of other supercooled water droplets already present.
- These supercooled particles will adhere to the water droplet's surface, forming layers of ice around it.
- As the water droplet reaches higher elevations within the cloud it comes into contact with more and more supercooled particles.
- This is because it is at the highest parts of the cloud, where the temperature is too low (at least 32 degrees Fahrenheit) for water molecules to remain in either a liquid or gaseous state.
- The hail embryo will grow larger and larger as it reaches higher altitudes in the updraft.
- The hailstone will reach a size and weight where gravity will begin to act on it and pull it down.
- However, this is not necessarily the end of its formation, as it could be pulled into another strong updraft and remain in the upper part of the cloud.
- Hail forms as super-cooled droplets, ice crystals and water freeze upon an embryo hailstone.
- Once hail forms, gravity will bring the hail to the earth's surface. If the updraft is stronger than the pull of gravity, the hailstone will continue to grow.
- Once the hail reaches a size that the updraft can no longer keep aloft, the hail stone will make its way down.



Source: everythinglubbock.com

Conclusion

Though occurrences of hailstorm are unavoidable, need is felt now for its prediction followed by recovery, rescue and remedial measures. There are methods available these days to detect hail-producing thunderstorms using weather satellites and weather radar imagery. Severe weather warnings are issued now for hail when the hail reach a damaging size, as it can cause serious damage to structures, crops and live stocks.

