

**1. How are wetlands formed? What is their global distribution? Why are they so important for the ecosystem? Explain.**

**Approach-**

Candidates need to write about wetlands first. Then simply as per demand write how it's formed and it's global distribution. Also highlight it's ecosystem importance before the conclusion.

**Introduction**

Wetlands are areas where water is the primary factor controlling the environment and the associated plant and animal life. They occur where the water table is at or near the surface of the land, or where the land is covered by water.

**Body**

Formation of wetlands:

- Flooding of coastal lowlands from rising sea levels has created broad coastal marshes that are protected from wave action by barrier islands or reefs.
- River floodplains develop through erosion processes and through deposition of sediment on adjacent lands during floods.
- Glaciers helped to create wetlands in the northern states 9,000-12,000 years ago. Large wetlands formed when glaciers dammed rivers, scoured valleys, and reworked floodplains.
- Wetlands may also form in "sink holes" and other areas where percolating water has dissolved bedrock. Earthquakes can create wetlands by damming rivers or causing land to drop down near the water table or shoreline.
- People create wetlands. Some "incidental" wetlands are formed when highway and dam construction, irrigation projects, or other human activities alter drainage patterns or impound water.

Global distribution:

- Mangroves such as the Sundarbans on the Ganges delta in India and Bangladesh, the Niger Delta complex in Nigeria and Cameroon, and the Orinoco and Gulf of Paria deltas on Venezuela's east coast.
- Salt marshes inland wetland systems develop saline conditions when the rate of evapotranspiration Scarborough Marsh and Morecambe Bay and Portsmouth in Britain and the Bay of Fundy in North America.

- Tidal freshwater marshes tidal freshwater marshes include the St. Lawrence River between the United States and Canada, the Rhine and Thames rivers in Europe, and the Yellow River (Huang He) in Asia.
- Peatlands Tropical peatlands are found in the lowlands of East Asia and Southeast Asia, the Caribbean, Central and South America, and Africa.
- Freshwater forested swamps are dominated by trees or other woody vegetation found for example from Delaware to Texas and along the Mississippi River.
- Riparian wetlands occur along rivers and streams that periodically overflow their channel confines, causing flooding to which the wetland vegetation is adapted. Occur in the Amazon Basin of South America, in Bangladesh, and in the floodplains of large rivers such as the Mississippi in the United States.

**Importance:**

- Wetlands are highly productive ecosystems that provide the world with nearly two-thirds of its fish harvest.
- Wetlands' microbes, plants and wildlife are part of global cycles for water, nitrogen and sulphur. Wetlands store carbon within their plant communities and soil instead of releasing it to the atmosphere as carbon dioxide.
- Wetlands function as natural barriers that trap and slowly release surface water, rain, snowmelt, groundwater and flood waters.
- Wetland vegetation also slow the speed of flood waters lowering flood heights and reduces soil erosion.
- They provide habitat for animals and plants and many contain a wide diversity of life, supporting plants and animals that are found nowhere else.

**Conclusion**

Effective collaborations among academicians and professionals, including ecologists, watershed management specialists, planners and decision makers for overall management of wetlands.

**2. With the help of suitable examples, explain the causal link between precipitation and flora.**

**Approach**

Students are expected to write about the causal link between the precipitation and flora. Can start with definition of precipitation and then explaining the link of both with examples.

**Introduction**

Precipitation occurs when tiny droplets of water, ice or frozen water vapor join together into masses too big to be held above the earth. They then fall to ground as precipitation.

**Body**

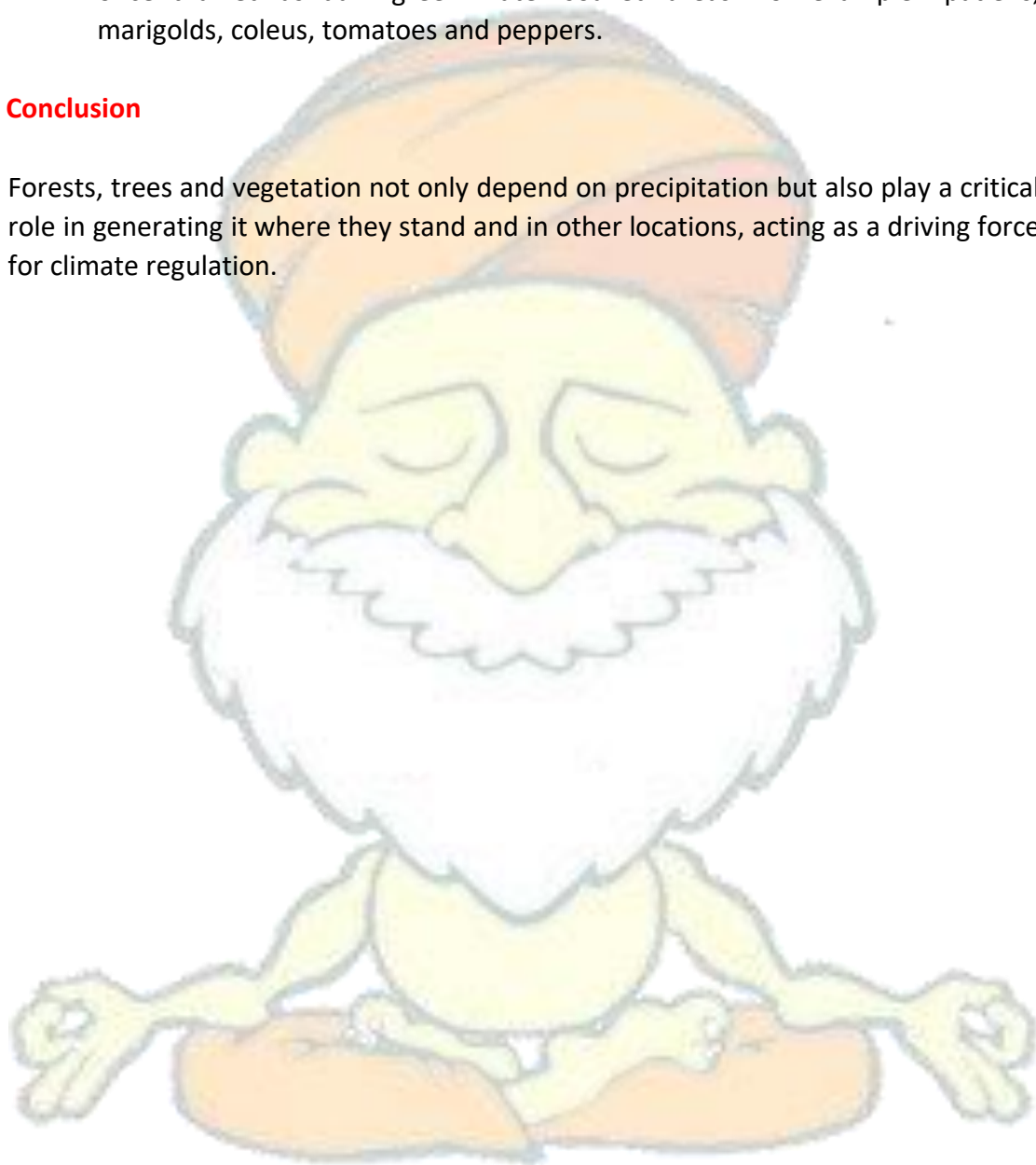
The term precipitation denotes all forms of water that reach the earth from the atmosphere. Usual forms are rainfall, snowfall, hail, frost and dew. Of all these, only the first two contribute significant amounts of water. Magnitude of precipitation varies with time and space.

- Forest-based ecosystems provide an ecosystem service that extends well beyond their ability to produce biomass, carbon sequestration it also help to scale of the water cycle.
- Precipitation in the Blue Nile Basin originating from West African rainforests an area which is seeing an increasing amount of deforestation. If deeforestation continues on its current track, we could lose as much as 25 percent of the rainfall in the Ethiopian highlands.
- The main climatic factors are rainfall and temperature. The amount of annual rainfall has a great bearing on the type of vegetation. For example rainfall 200 cm or more its Evergreen Rain Forests and Below 25 cm it's Desert (Arid) vegetation.
- One of the most important ingredients for plant growth is water. In many ecosystems, particularly grasslands and cropland, seasonal plant growth occurs in perfect synch with the rainy season. For example times of drought, vegetation in these ecosystems grows poorly, if at all. Abundant rain leads to a burst of green.
- Snow can actually be beneficial to landscape plants. Its acts as an insulator and can protect some plants from the effects of freezing and thawing and provides moisture as is melts.

- Dew forms a protective barrier on the leaf; transpiration will not occur until the dew evaporates. Dew can be beneficial when it comes to providing plants with additional moisture and reducing plant stress from drought conditions.
- Frost creates freezing damage. The ice crystals physically rupture cell walls and membranes within the cells causing physical damage. Damage can be seen once thawed as dark green water soaked areas. For example impatiens, marigolds, coleus, tomatoes and peppers.

### Conclusion

Forests, trees and vegetation not only depend on precipitation but also play a critical role in generating it where they stand and in other locations, acting as a driving force for climate regulation.





**3. What do you understand by Fed tapering? How does it affect the economy of developing countries? What measures are usually adopted to lessen the impact of Fed tapering on the domestic economy? Discuss.**

**Approach-**

Candidates need to write about the Fed tapering and then explain how it affect the economy of developing countries. Also discuss measures adopted to lessen the impact of Fed tapering on the domestic economy.

**Introduction**

Tapering refers to the Federal Reserve policy of unwinding the massive purchases of Treasury bonds and mortgage-backed securities it's been making to shore up the economy during the pandemic. The reason the Fed has decided to accelerate the process is likely because it now believes inflation may be less transitory than it had hoped, at the same time that the labor market appears strong.

**How does Fed tapering affect the economy of developing countries:**

- An aggressive financial tightening would raise US yields and strengthen the US dollar against EM currencies. As a result, portfolio flows would abruptly reverse.
- The sudden stops and reversal of capital flows will lead to depreciation pressures on EM currencies. When foreign investors invest in equities, bonds and other financial assets in EMEs, they measure financial returns in the US dollar and other foreign currencies. If the EM currency depreciates against the US dollar, it decreases the value of their investments in dollar terms and, therefore, they may engage in distress sales of funds.
- The Fed's policy guidance that it would raise borrowing costs more quickly did not cause a substantial market reassessment of the economic outlook.
- Should policy rates rise and inflation moderate as expected, history shows that the effects for emerging markets are likely benign if tightening is gradual, well telegraphed, and in response to a strengthening recovery.
- Emerging-market currencies may still depreciate, but foreign demand would offset the impact from rising financing costs.
- Even so, spill overs to emerging markets could also be less benign. Broad-based US wage inflation or sustained supply bottlenecks could boost prices more than anticipated and fuel expectations for more rapid inflation.
- Faster Fed rate increases in response could rattle financial markets and tighten financial conditions globally.

**What measures are usually adopted to lessen the impact of Fed tapering on the domestic economy:**

- A depreciated currency would undoubtedly help boost exports, benefiting countries like Saudi Arabia and Iran that export energy, but would hurt countries like India, Indonesia and Turkey that import oil and gas.
- Secondly, EMDEs and LICs with a large stock of foreign currency debt and low forex reserves will be particularly vulnerable to tightening global financial conditions. This group of countries includes Argentina, Colombia, Indonesia, Turkey and Sri Lanka.
- Thirdly, a rising US dollar would increase the debt-servicing costs (in local currencies) of EM non-financial corporates (NFC) with unhedged currency exposure, thereby exacerbating liquidity and solvency concerns.
- Fourthly, in response to faster rate hikes by the Fed, EME central banks would have to raise interest rates to maintain interest rate differentials, prevent capital outflows and domestic currency depreciation, despite sluggish recovery and growth risks.
- Indeed, tighter monetary policy by the US and other advanced economies presents dilemmas for policymakers in EMEs.
- If EM central banks continue the current loose monetary policy with low-interest rates, it will lead to capital outflows and domestic currency depreciation.
- On the other hand, if EM central banks pursue tighter monetary policy by increasing interest rates too early, it would derail a fragile domestic economic recovery. Hence, both options risks undermining the economic recovery process. Only those EMEs that actively manage capital accounts can pursue some degree of monetary autonomy.
- As the US Federal Reserve gears up to taper its huge asset purchases, the impact on Indian market is likely to be limited and there is unlikely to be a repeat of 2013 when it caused huge volatility across markets.

**Conclusion**

While the global recovery is projected to continue this year and next, risks to growth remain elevated by the stubbornly resurgent pandemic. Given the risk that this could coincide with faster Fed tightening, emerging economies should prepare for potential bouts of economic turbulence.