General Studies – 3; *Topic: Effects of liberalization on the economy, changes in industrial policy and their effects on industrial growth*

Mangrove Conservation and Restoration

1) Introduction

- Mangroves are trees or large shrubs which are salt-tolerant and grow in intertidal zones in tropical and subtropical regions
- Mangrove restoration has been used as an ecosystem-based disaster risk reduction and adaptation measure, particularly following the 2004 Indian Ocean Tsunami.

2) Benefits of Mangroves

- Diversity of mangrove roots and their position gives mangroves an important role as habitats for numerous species.
- Mangroves also act as a refuge for corals from ocean acidification
- Mangroves filter and trap sediment from run-off and river water before it reaches adjacent ecosystems.
- Reduces the turbidity of the water and allowing essential light to reach ecosystems
- Mangroves are among the most carbon-rich forests in the tropics. They help in carbon sequestration.
- Conservation and restoration of mangroves can therefore contribute significantly to climate change mitigation.
- Their ability to trap organic sediment and thus store carbon, they are referred to as 'blue carbon' sinks.
- Shoreline protection based on mangrove tree and root structures in reducing erosion.
- Food resources for animals such as migratory birds and fish
- Visual amenity where selected mangrove trees provide shoreline beautification.

3) Nature of Mangrove Destruction

- Rapidly increasing development has put numerous direct and indirect pressures on coastal ecosystems
- Climate Change is likely to further intensify the loss of biodiversity.
- With increases in extreme weather events, sea-level rise, warming of the sea surface temperatures and ocean acidification social, economic and environmental problems will be faced by the people of India.
- Human activities, including conversion to aquaculture, coastal development, overexploitation of timber and pollution, have been the primary causes of mangrove loss
- Mangroves are destroyed through defoliation, erosion, burial by sediment and uprooting by high winds
- High levels of salinity, heavy metals and chlorine.

4) Concerns / Challenges

- Deforestation in these systems releases a disproportionate amount of carbon into the atmosphere as the carbon protected by mangroves is released.
- lack of education and awareness regarding the importance of mangroves, and ignorance of rules and regulations regarding conservation of mangroves
- The poverty of the local inhabitants, which forces them to depend on mangroves for their fuelwood, timber and fodder requirements

- Difficulties of protection because of the scattered geographic distribution of mangroves

5) Sunderbans Mangroves

- **Need for Conservation**
  a. It has a unique population of tigers
  b. Helps to sustain millions of people with food, water and forest products.
  c. The mangrove tree species, including the Sundari, which has historically helped the local economy in the construction of boats and bridges
- **Concerns**
  a. There is evidence of loss of forest cover in the Indian Sundarbans.
  b. Climate change appears to be an emerging threat to the Sundarbans Mangroves.
- **Solution**
  a. Local actions that will protect the banks from erosion, and policies that address the pressures created on natural resources
  b. Promote ecotourism to raise awareness and funds
  c. International climate finance to be channelled to India and Bangladesh for the region's preservation, given its global uniqueness.
  d. Local communities must be pulled out of poverty to relieve the pressure on natural resources.
  e. Encourage Climate research and social science
  f. The Information Technology should be utilized effectively to spread the awareness regarding the issue of Sundarbans.

6) Recommendations

- Wherever possible, preservation of existing mangroves is to be prioritised
- The long-term solution to coastal and marine ecosystem degradation requires a holistic and integrated approach.
- People's involvement in mangrove management on public lands, Plantation of mangroves for creating green belts and post-planting monitoring.
- Community ownership and sense of responsibility is important in long-term successful conservation and restoration efforts
- Programmes to raise people's awareness of the importance of mangroves, e.g. through films, exhibitions, newspapers, study tours in the mangrove forests, establishment of mangrove parks and celebration of Mangrove Conservation Day.
- Enforcement of environmental protection laws
- Integration of environmental management principles, such as biodiversity conservation into economic production activities is necessary.
- Environmentally sustainable livelihoods to reduce pressure on coastal ecosystems
- Bridging gaps between existing policies and implementation and promoting best practices in collaborative coastal forest protection.
- As mangroves age, they store proportionally more carbon in their biomass because of higher productivity. Protection of mangroves should, prioritise older stands.

7) Recent initiatives

- Apollo Tyres and Wildlife Trust of India have entered into a partnership to restore a critical mangrove project in Kerala's Kannur district.
- Asia's first mobile phone application dedicated to the mangrove ecosystem was launched by Maharashtra.