



GLACIER MELTING - GS III MAINS

Q. Glacier Melting has been on a large scale since industrialisation. Discuss threats from contracting glaciers with special reference to Arctic Glaciers Melting. (15 marks, 250 words)

News: *An icy warning: On threats from contracting glaciers*

What's in the news?

- Few barometers measure the climate crisis as evocatively as the state of glaciers, a key component of the cryosphere.
- The World Meteorological Organization's recent report, The Global Climate 2011-2020, gives a broad view of the planet's response to greenhouse gas emissions.
- In the section on the state of glacier health, it points out that, on average, the world's glaciers thinned by approximately a metre a year from 2011 to 2020.

Causes:

- **Global warming:**
 - Rising temperatures cause glaciers to melt faster than they can accumulate new snow.
- **Human activities:**
 - Deforestation, burning of fossil fuels and industrial processes etc. contribute to the emission of greenhouse gases, which are a key driver of global warming, which in turn leads to the melting of glaciers.
- **Changes in precipitation:**
 - Changes in the amount, timing and form of precipitation can also affect the extent and thickness of glaciers.
- **Natural factors:**
 - Natural factors such as volcanic activity and changes in solar radiation can also affect glacier melting.

Impact:

- **Rising sea levels:**
 - Melting glaciers contribute to rising sea levels, which can have devastating effects on coastal communities and infrastructure.
- **Water scarcity:**
 - Glaciers are an important source of freshwater for many communities around the world. As glaciers melt and retreat, it can lead to water scarcity and affect agriculture and other industries.
- **Changes in weather patterns:**



- Melting glaciers can affect weather patterns, leading to changes in temperature, precipitation and other weather-related phenomena.
- When glaciers melt, the resulting freshwater enters the ocean, which can destabilize the salinity balance of the North Atlantic and weaken the AMOC.
- This weakening can cause changes in regional climate patterns, such as cooler temperatures in Europe and increased hurricane activity in the North Atlantic.
- **Ecosystem disruption:**
 - Melting glaciers can cause ecosystem disruption, leading to changes in biodiversity, food webs and other ecological systems.
- **Potential for natural disasters:**
 - Melting glaciers can create the potential for natural disasters, such as flash floods or landslides, which can have catastrophic effects on human life and infrastructure.
- **Reduced albedo effect:**
 - As glaciers melt, they reduce the earth's ability to reflect sunlight back into space, leading to increased absorption of solar radiation and warmer temperatures.

Strategies:

- **Reduce carbon emissions:**
 - This can be done by increasing the use of alternative energy sources such as wind and solar power, and by implementing policies to reduce energy consumption.
 - e.g. fulfilling the net zero emission targets.
- **Promote energy efficiency:**
 - This includes measures such as improving building insulation and promoting the use of energy-efficient appliances.
 - e.g. Green Housing Scheme by National Housing Bank
- **Encourage public transportation:**
 - This can reduce the use of private cars and consequently the emission of greenhouse gases.
 - e.g. Public Transport Fare Subsidy Scheme in Hong Kong.
- **Reduce waste and recycle:**
 - This can reduce the amount of greenhouse gases released through landfill and other waste disposal methods.
- **Reduce deforestation:**
 - Deforestation causes a loss of natural carbon sinks, decreasing the earth's capacity to absorb carbon dioxide. e.g. REDD+.
- **Plant more trees:**
 - Trees absorb carbon dioxide from the atmosphere, so planting more trees can help reduce the amount of greenhouse gases in the air.
- **Implement sustainable agriculture practices:**



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- These practices can help reduce emissions from agricultural activities and preserve water resources.
- e.g. conservation tillage
- **International agreements:**
 - Governments can work together on international agreements to limit carbon emissions and combat global warming.
 - e.g. Paris Agreement, Montreal protocol etc
- **Adaptation measures:**
 - It is also important to plan and implement adaptation measures to address the impacts of melting glaciers, such as flooding, water resource management and infrastructure protection.

