

Q7. What are Tsunamis? How and where are they formed? What are their consequences? Explain with examples. (150 words)

A Tsunami is a series of large ocean waves caused by the sudden displacement of a large volume of water.

Causes of Tsunami

- Undersea Earthquakes
- Volcanic Eruptions
- Landslides

Where form

- Tectonic plate boundaries
- Volcanic Regions (Krakatoa – Indonesia)
- Coastal & underwater landslide (sea floor displaced)



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Effects

- Flooding of coastal areas.
- Loss of life and property.
- Damage to ecosystems (mangroves, coral reefs).
- Long-term economic (Infrastructure loss , Agriculture and fisheries)
- social impacts. (Mental trauma)

Examples

- 2004 Indian Ocean Tsunami: Triggered by a magnitude 9.1 earthquake near Sumatra;
- 2011 Japan Tsunami: Caused by a magnitude 9.0 earthquake; led to the Fukushima nuclear disaster.

Tsunami is not a single wave, but a series of powerful waves generated by sudden disturbances in or near the ocean leading to catastrophic impact on society.

Q.15 How can Artificial Intelligence (AI) and drones be effectively used along with GIS and RS techniques in locational and areal planning? (250 words)

➤ **Urban planning**

Analyze population density ,land use , traffic flow

➤ **Agriculture**

Drones can monitor crop health
Precision Farming (Fertilizer & irrigation)

➤ **Disaster management**

RS + drones provide real time flood & cyclone mapping

➤ **Environmental monitoring**

Forest cover , mapping desertification , wetland management

➤ **Infra Project**

Drones + AI – Terrain mapping Highway , Railway Mining project

Synergy of AI drones GIS & RS - Enhance decision making through accurate , real time & future prediction of disasters

Q.16 Discuss how the changes in shape and sizes of continents and ocean basins of the planet take place due to tectonic movements of the crustal masses. (250 words)

Changes

1 Divergent plate Boundaries

- Ex Mid – Atlantic Ridge .
- African Rift valley – potential Future ocean basin

2 Convergent Plate Boundaries

- Ocean –ocean (Mariana Trench, Japanese Archipelago , Tonga island , Lesser Antilles)
- Ocean – continent (Andes Mountain – Nazca Plate)
- Continent –Continent (Himalaya)

3. Transform Boundaries

Ex – San Andreas Fault (California)

Tectonic movements – dynamic Forces

Explain past super continents ,Present land form, & Future continental Rearrangement

Q.17 Discuss the distribution and density of population in the Ganga River Basin with special reference to land, soil and water resources. (250 words)

Factors

1 Land

Fertile alluvial Plains -high Density .

2 Soil

Fertile suitable for rice wheat sugarcane – Intensive Agriculture leads to population Cluster.

Ex Bihar (1102 People per sqkm)

3 Water Resources

Ganga and its Tributaries

Canal and ground water availability



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**Q4. How are climate change and the sea level rise affecting the very existence of many island nations?
Discuss with examples. (150 words)**

Impact

1 Agriculture

- Loss of arable land
- Food insecurity

2 Economic

- Loss of Tourism & Fisheries
- Impact on Blue Economy
- Mangroves and coral

3. Rising sea level

- Submergence of coastline
- Flooding
- Migration
- Refugee crisis (Tuvaluans migrating to New Zealand)

National Centre for coastal Research -32 % of India's coastline underwent sea erosion.

Maldives

Sierra Leone (Nyangai)
Solomon Island (South Pacific)



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Q.5 What are non-farm primary activities? How are these activities related to physiographic features in India? Discuss with suitable examples. (150 words)

Non – Farm Primary Activities

Primary Sector Activities other than agriculture

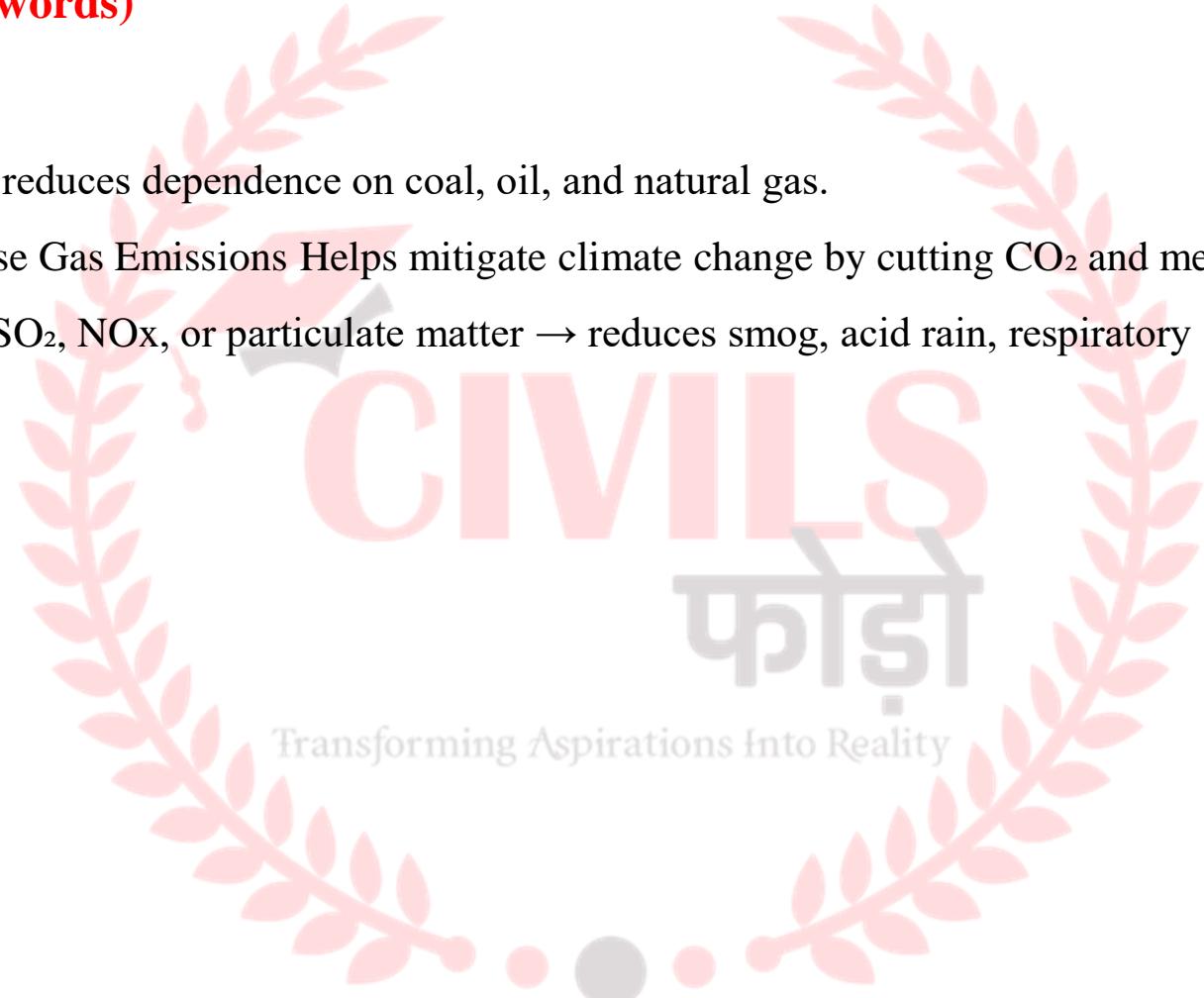
Ex

- Fishing (Coastal Plains- Kerala , Andhra Pradesh WB)
- Forest (Himalaya Western Ghats)
- Mining & Quarrying (CNP – Coal , Iron)
- Animal Husbandry (Camels in Rajasthan desert)
- Dairy

Q.6 Explain briefly the ecological and economic benefits of solar energy generation in India with suitable examples. (150 words)

Ecological Benefits

1. Clean & Renewable → reduces dependence on coal, oil, and natural gas.
2. Reduction in Greenhouse Gas Emissions Helps mitigate climate change by cutting CO₂ and methane emissions.
3. Improved Air Quality (SO₂, NO_x, or particulate matter → reduces smog, acid rain, respiratory diseases.)
4. Water Conservation.



Economic Benefits

1. Energy Security & Reduced Imports Cuts India's oil & coal import bill,
2. Employment Generation Solar projects create jobs in manufacturing, installation, operation & maintenance.
Decentralized rooftop solar encourages local entrepreneurship.
3. Low Operating Costs After installation
4. Affordable & Inclusive Energy Rooftop solar and off-grid systems provide cheap electricity in rural & remote areas. Supports Digital India & rural electrification.
5. Boost to Ancillary Industries Growth of solar panel manufacturing, battery storage, EV charging infra → strengthens domestic industry.

Q.14 Give a geographical explanation of the distribution of off-shore oil reserves of the world. How are they different from the on-shore occurrences of oil reserves? (250 words)

- **Middle East & Persian Gulf:** Saudi Arabia, Iran, Iraq, UAE, and Kuwait hold vast reserves, much of which extend into the shallow Persian Gulf.
- **North Sea Basin:** UK and Norway developed significant off-shore production during the late 20th century, exploiting fields in the North Sea continental shelf.
- **West Africa (Gulf of Guinea):** Nigeria, Angola, and Ghana have deep-water reserves that have become major contributors to global output.
- **South & North America:** Brazil's Campos and Santos Basins (pre-salt deposits) and Mexico's Gulf of Mexico fields are key global reserves.
- The U.S. Gulf of Mexico is also a leading producer.
- **Asia-Pacific:** Offshore fields in Malaysia, Indonesia, Vietnam, are important regional sources.

Difference from On-shore Occurrences Location & Access:

- On-shore reserves occur in continental sedimentary basins (Texas, Rajasthan), while off-shore reserves lie beneath sea-beds, often requiring drilling platforms.
- **Technology & Cost:** Offshore exploitation is technologically complex, requiring rigs, subsea pipelines, and high investment, whereas on-shore drilling is relatively easier and cheaper.
- **Risks:** Offshore oil is exposed to marine hazards (storms, oil spills, accidents) compared to land-based risks.
- **Contribution:** While on-shore reserves historically dominated production, off-shore reserves now account for nearly one-third of global oil, especially as many on-shore basins mature.

Transforming Aspirations Into Reality



*THANKS FOR
WATCHING*