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कृपया इस स्थान में प्रश्न संख्या के अतिरिक्त कुछ न लिखें।

UPSC

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Name - SRISHTI DABAS

Test Date - 21 August 2023

Time - 4:35 - 7:45 pm

MGP 4 (GSI Sectional Test 8 - 611202)



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write the answers
in this space)
कृपया इस स्थान
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न लिखें।Answer Questions in NOT MORE THAN the Word Limit specified for each in the Parenthesis.
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①

What do you understand from land subsidence?
Explaining various reasons behind land subsidence,
recommend measures to arrest the calamity. (10m)

Land subsidence refers to the
SLUMPING and SINKING of earth's
surface, leading to decline in
elevation of land.

☞ Recently in Joshimath

Reasons behind land subsidence

- ① Unsustainable urbanization -
creation of homes, roads, railways
in ecologically sensitive areas.
- ② Unsustainable tourism - exceeding
carrying capacity of land.
- ③ Waste disposal and poor drainage
infrastructure.
- ④ Excessive pollution - soil, air,
water.

5) Immense deforestation - destabilize land as binding force of soil reduces.

6) Illegal mining - for sand, gravel, minerals.

7) Climate change - due to anthropogenic activities.

Measures to arrest the calamity

STRUCTURAL

- check on illegal constructions.
- afforestation, contour farming, Miyawaki
- retention walls to mitigate landslides

NON-STRUCTURAL

- law enforcement to check illegal mining.
- capacity building of local people.
- Hazard mapping
- EWS.

All this, along with GANDHINAGAR DECLARATION for sustainable tourism must be adopted.

②

Despite being rich in forest resources, why do tropical regions have limited growth of (10m) lumbering industry in comparison to temperate regions?

Lumbering refers to the activities involving cutting trees for timber, transportation of logs of woods and utilization in industries, eg: paper industry.

Reasons for limited growth of lumbering industry in tropical areas →

① Excessive rainfall in tropical regions increases moisture content of wood, making it unsuitable for use.

② Huge canopy of tropical rainforests makes it difficult for people to enter & cut trees.

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③ Immense temperatures of tropical areas act as barrier.

④ The trees in tropical regions are huge, massive and tall - difficult for commercial exploitation

However, in temperate areas, we find:

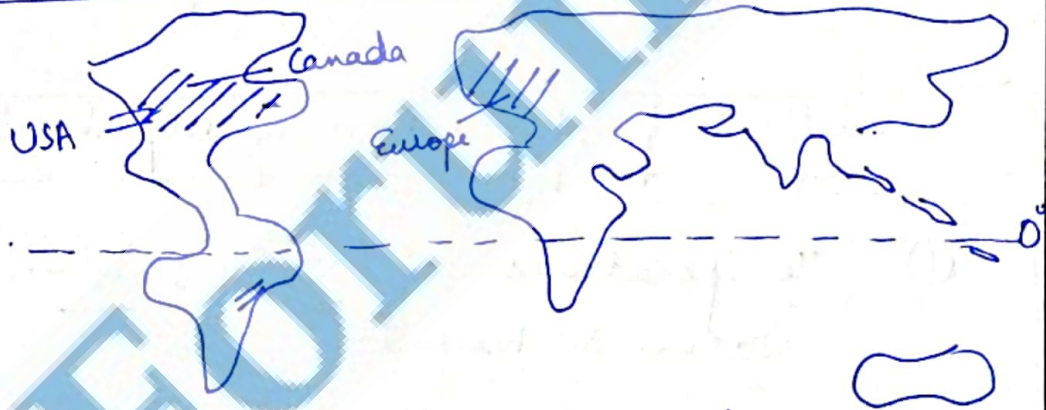


Fig: Lumbering industry

- (1) ease of commercial exploitation.
- (2) relatively favourable temperature
- (3) appropriate rainfall.
- (4) River channels to transport wood of River Superior in USA.

Hence, lumbering flourishes in temperate areas

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3

What are the suitable conditions for formation of tropical cyclone? Also, bring out differences between a tropical & an extra tropical cyclone. (10m)

Tropical cyclone refers to a low pressure formation which whirls around in circular motion, as cyclone is derived from the term CYCLOS meaning coils of a snake.

Conditions for formation of tropical cyclone

- ① Temperatures of 21° - 27°C - warm & humid
- ② ITCZ = Inter Tropical convergence zone - meeting of Trade winds
- ③ Low pressure area - to enable pressure gradient to act
- ④ Divergence in upper air circulation
- ⑤ Latent heat - found over water bodies, like oceans

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Tropical Cyclones

- ① formed at high temperature and ITCZ.
- ② over tropical region ie. 10°N - 10°S.
- ③ formed over water & dissipate on reaching land.
- ④ much more destructive.
- ⑤ over lesser area.
- ⑥ move from East to West.

Extra Tropical, ie. Temperate cyclones

- ① formed because of fronts of warm & cold air.
- ② over temperate areas, ie. 30-35° N & S.
- ③ exist over both land and sea.
- ④ less impactful.
- ⑤ spread over larger area.
- ⑥ West to East.

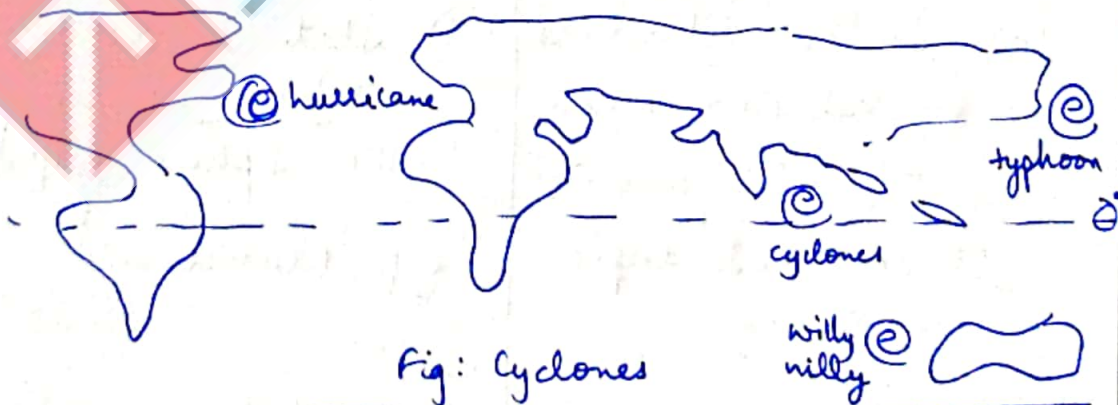


Fig: Cyclones

Cyclones are thus a destructive extreme weather phenomena, increasing with climate change.

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4

Elucidate differences between Western and Indian model of secularism. To what extent do you agree with criticism that Indian model of secularism is susceptible to promoting minority appeasement? (10m)

Secularism is the separation of state and religion, however it differs in East & West as:-

Indian Model of Secularism

- 1) principled distance between state & religion.
- 2) Based on Ashoka's idea of Sama Samkhya
- 3) state intervenes in religion when necessary
e.g. abolished triple talaq
- 4) positive conception

Western Model of Secularism

- 1) strict separation between state & religion.
- 2) Based on Machiavelli's separation of politics & religion
- 3) state never intervenes in the sphere of God
e.g. France -
- 4) negative conception of divergence

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4) state promotes all religions & assists when needed
≠ Hajj pilgrimage

5) state neither promote nor oppose any religion.

Indian Model of Secularism : A Tool for Minority Appeasement

Yes

No

1) vote bank politics where people polarised on religious lines.

2) state intervenes in partial manner
≠ Burkha controversy

3) minority religious institutions allowed by constitution itself

1) state respects all religions equally

2) Art 25-28 : Right to religion upheld.

3) state intervenes only to safeguard rights & dignity
≠ Sabari mala judgement.

Hence, Indian model of secularism is SUI-GENERIS to ensure tolerance & accomodation.

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5

Discuss the multi-dimensional implications of uneven distribution of semiconductor industry in the world.

(10m)

Semiconductor industry is a life quanon for industrial growth, mobility and development. of EVs.



Fig. Semiconductor Industry

Implications of uneven distribution of semiconductor industry include:-

① Geostrategic

→ excessive dependence of developing nations on countries with critical minerals.

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⇒ India imports > 50% of semiconductor chips from China.

→ creates vulnerability during crisis periods ⇒ Russia Ukraine war.

② Geoeconomic

→ Nations with well established semiconductor industry earn forex from exports, employment generation.

→ But nations depending on imports face current account deficit.

→ supply chain disruptions ⇒ during covid.

③ Ecological and Social

→ child labour employed in mining of Lithium, Cobalt ⇒ Congo

→ exploitation by MNCs ⇒ China's Debt Trap Diplomacy.

→ dumping waste, pollution ⇒ e-waste dumped in S.Africa.

There is need for better supply chain resilience
exploration of critical minerals & global collaboration

6

Examining the reasons behind erratic monsoon, highlight the possible outcomes of the same. (10m)

Monsoon, derived from the root word MOUSIM, refers to the seasonal reversal of winds. It is called as the "FINANCE MINISTER" given its impact on economy, agriculture & society.

Reasons behind erratic Monsoon

Natural

① El Niño & La Niña influence monsoons, where former leads to droughts in India while later in S. America.

② Indian Ocean Dipole impacts monsoon intensity.

Anthropogenic

① Human induced Global Warming has led to melting of ice sheets & glaciers - impacting ocean currents.

② Pollution - of air and water has multiplier

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③ Madden Julian Oscillations further impact.

④ The shifting of ITCZ, heating of Tibetan plateau and Jetstreams all influence monsoon

impact on climatic phenomena.

③ Mindless industrialization and urbanization have lead to more waste generation, landing into oceans & atmosphere.

Outcomes of Erratic Monsoon

① Disrupt Agriculture
↳ decline in productivity
↳ loss of livelihood of farmers.

② Extreme weather events
↳ From droughts to floods
↳ cyclones & tsunamis.

③ Reduce productivity of labour - due to heat waves, urban floods, etc.

④ Changes river courses
↳ Damodar - sorrow of Bengal.

Hence, as far as possible, we need to restrict our unsustainable activities & evolve forecasting systems

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7

Why is Antarctica becoming an area of renewed human interest? Examine the significance of Antarctic Bill 2022 in protecting India's interest in the region.

(10m)

Antarctic is becoming the arena of New Great Game where nations have showed immense interest.

Reasons for Renewed Human Interest

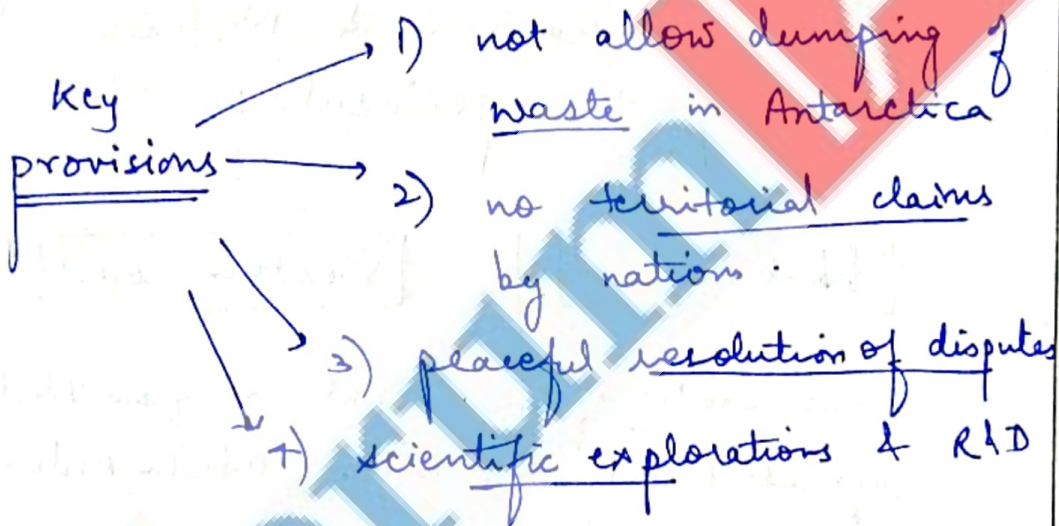
- ① Mineral exploration - rare earth minerals, polymetallic nodules, critical minerals.
eg. Li, Co, Mo.
- ② Energy resources - oil, gas explorations
- ③ Scientific Explorations -> R&D, innovation, missions (eg: India's Maitri)
- ④ Pharmaceutical industries growth prospects.
- ⑤ Fisheries - means of livelihood.
- ⑥ Navigation route - reduce time - enhance trade



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All this has happened due to Climate change and melting of glaciers and ice caps of Iceberg A-76 of Antarctica

Antarctic Bill 2022



Its significance to protect India's interest include -

- ① Geostrategic - as Antarctica opens up new channels of trade.
- ② Geoeconomic - to safeguard nutrition & energy security.
- ③ not let any nation gain preponderance especially China.

The implementation of the Bill will make all the difference to ensure BLUE ECONOMY

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8

How does the Eastern coast of India differ in its geographical features from the Western coast?

(10m)

India has a huge coastline of around 7500 km differing across the Eastern & Western side of the peninsula:-

Western coast

Eastern coast

1) covers states of Gujarat, Maharashtra, Goa, Karnataka, Kerala

1) extends from West Bengal, Odisha, Andhra Pradesh to Tamil Nadu

2) is coast of submergence

2) is coast of emergence.

3) has various estuaries

3) forms numerous deltas

eg Ashtanudi, Vembanad.

eg Krishna Godavari delta

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4) numerous small rivers drain, into Arabian forming parallel drainage pattern.

5) more number of ports because wider continental shelf

eg Mumbai port
Kandla port

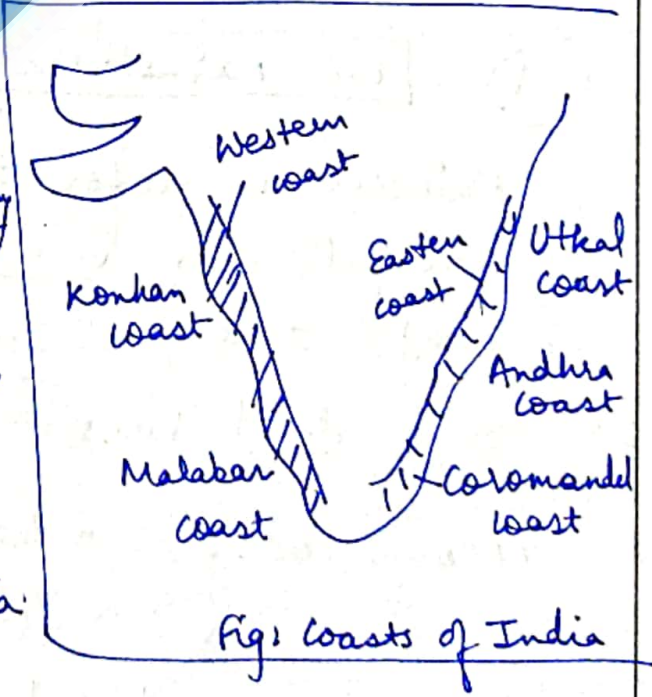
6) less prone to disasters.

4) large and mighty rivers drain into Bay of Bengal forming dendritic drainage pattern.

5) ~~more~~ less harbours and ports
eg Vishakhapatnam port.
(only 11 natural)

6) more prone to climatic hazards
eg cyclone Amphan

Yet despite differences both coasts are immensely crucial for national security, food security and disaster resilience of India.



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9

Explain meaning of colour coded weather warnings for

- Rainstorms
- Thunderstorms
- Duststorms

(10m)

Colour coded weather warnings are given by Indian Meteorological Department (IMD) to give proactive warnings before a disaster hits, to make preparedness and preventive measures e.g. for cyclones.

1) for Rainstorms

Rainstorms refer to immense rainfall in very short duration of time, including hailstorms and doud bursts.

Colour coding

- ~~Yellow~~ Green: no concern
- Yellow: need alert.
- Red: Extreme event

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② For Thunderstorms

Thunderstorms refer to extreme weather event of movement of air in circular & spiral motion, much like cyclones - with more destruction, water and lightning.
Colour coding \Rightarrow Yellow & Orange alerts to caution
 \Downarrow Red alert for impending disaster.

③ For Duststorms

Duststorms refer to swirling winds full of dry air & dust, much like the expanded version of loo.
Colour coding \rightarrow Yellow to warn
 \rightarrow Orange to take precaution
 \rightarrow Red - duststorm cause havoc

Hence, the colour coded warnings are necessary for Early Warnings on lines of Sendai framework.

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10

How has globalization and urbanization impacted the Indian family system?

(10 m)

Globalization refers to the increase in interconnectedness & integration of markets, exchange of goods, services, ideas, technology, people.

Urbanization refers to development of urban areas with industrialization.

Impacts of Indian Family System

I [Negative Impacts] →

- ① Rise of nuclear families -
 - break joint families.
 - people migrate in search of job opportunities; domestically as well as internationally.
- ② Alienation of grandparents
 - children have no time for them
 - busy in social media.

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③ increase in divorce rates and rise of single parent families.

④ importance of family (traditional role) of extending emotional support has somewhat declined.

Positive Impacts

① Families far yet closer
 - connected by technology
 of video conferencing.

② more acceptance to love marriages, even debate on same sex marriages.

③ Intermixing of cultures of families
 - as inter caste marriages increase

④ more friendly relations between parents & children
 - decrease in generation gap.
 - better understanding of challenges
 - more communication.

Hence, there have been both boons & bane

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11

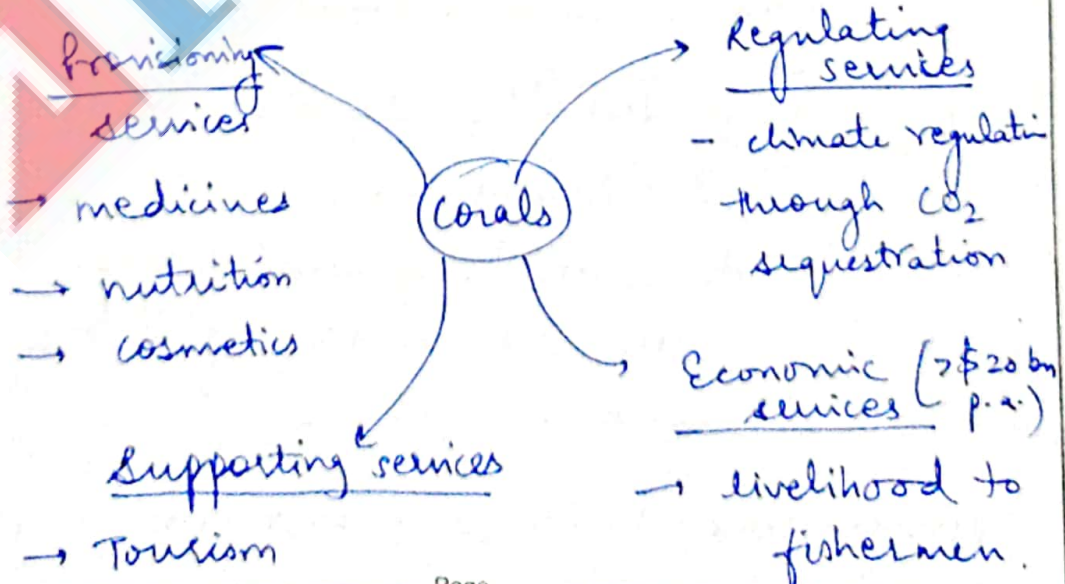
Coral reefs are considered to be at the epicentre of marine ecology, however their existence is threatened due to a plethora of anthropogenic & natural causes. Comment. (15m)

Coral reefs are the conglomerate structures made of calcium carbonate by symbiotic relationship between:



Coral reefs as epicentre of Marine Ecology

→ cover less than 1% of ocean floor but support 25% of biodiversity.



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Coral Reefs are epicentre as 1-

- ① Economies of some countries totally depend on them
 e.g. Seychelles earns 60% forex through corals.
- ② Coastal protection.
 ↳ against cyclones & tsunamis.
 ↳ safeguards lives & infrastructure.
- ③ Aesthetic value.
 ↳ used in cosmetics
 ↳ tourism industry e.g. snorkeling, diving.
- ④ forms beaches.
 e.g. Radhanagar beach, A & N.

But, existence threatened due to →

I Natural causes .

- ↳ change in climatic conditions by EL Niño, La Niña.
- ↳ volcanic eruptions damage corals

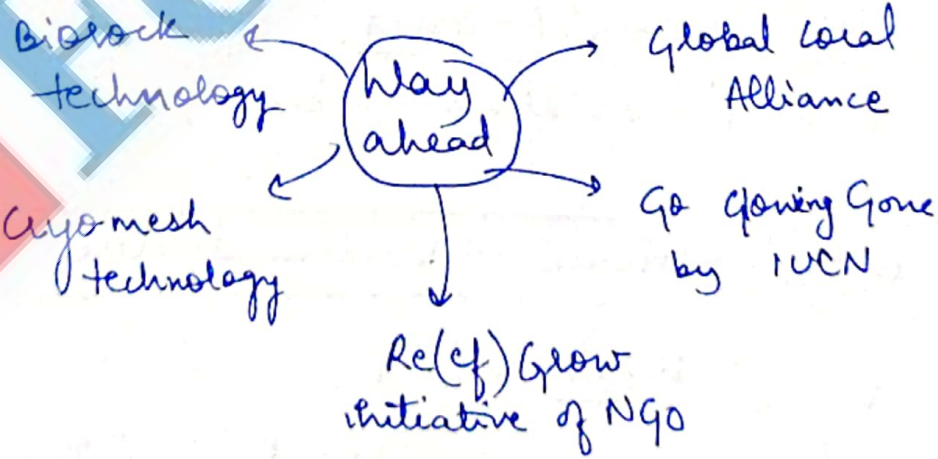
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- ↳ Sunspot cycles change solar irradiance.
- ↳ Alteration of ocean currents.

II Anthropogenic causes -

- ① Destructive fishing → Bottom trawling
→ Purse seine
- ② waste dumping at beaches
- ③ Oil spills
- ④ Pollution of air, water & soil -
- ⑤ unsustainable tourism at beaches
- ⑥ plastic, esp. microbeads pollution

All this leads to CORAL BLEACHING



We need sustainable BLUE ECONOMY to save corals & achieve SDG 14

Life Below Water



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12

Discuss the causes for salinity ingress along with its various consequences and potential solutions. (15m)

Salinity refers to the amount of dissolved salt in given amount of water, measured in parts per million. (‰)

eg. Saline water > brackish water > fresh water

Causes for Salinity Ingress.

① Natural factors.

↳ volcanic eruptions release lava, pyroclastic material and gases (especially CO₂).

↳ ocean acidification due to rising global warming.

↳ Alteration in ocean currents and Global conveyor Belts.

↳ enclosed seas have more salinity

↳ changing wind patterns moving salt rich waters across globe.

② Anthropogenic factors.

↳ excessive water pollution

↳ dumping of waste

↳ Human induced climate change impacting melting of glaciers & ice caps.

↓
Increase in water evaporation due to Global warming & rising temperatures, thereby raising salinity.

↓
Reduction in precipitation (which dilutes salinity)

Consequences of changing salinity

① AMOC = Atlantic Meridional Ocean circulation altered.

② Ocean currents change, further changing migratory patterns of sea horse, (recently)

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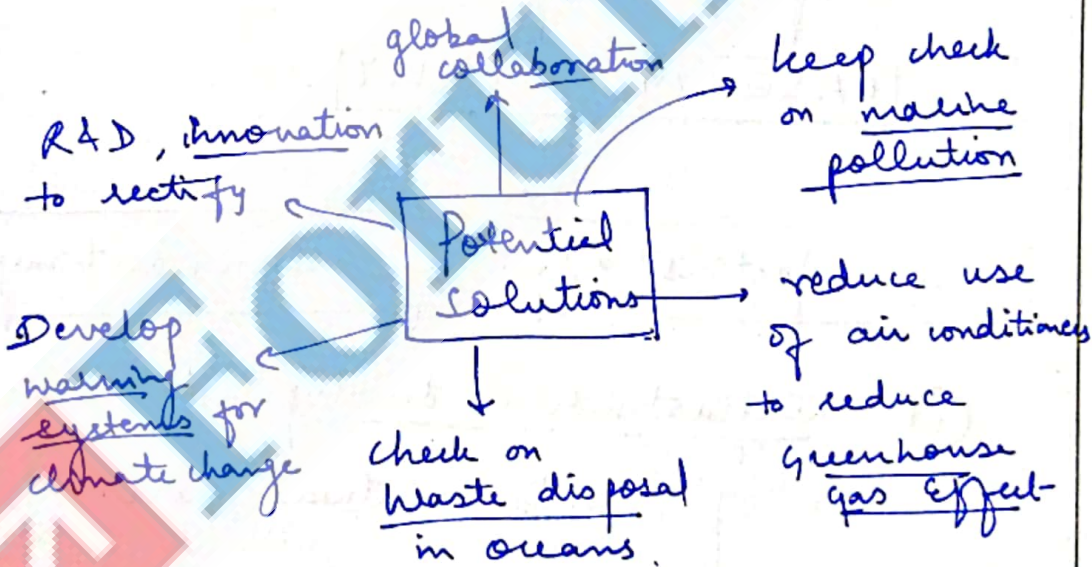
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- ③ Erratic monsoons - impact on agriculture.
- ④ change in biodiversity & fisheries - impact livelihoods.
- ⑤ Navigation routes hampered as dead zones created eg. Sea Snot, Turkey
- ⑥ Not just ocean ecosystem, but atmospheric cycles also disrupted.
eg. Hydrological cycle changed.



Mission Samudrayan of India will promote research, along with the Deep Ocean Mission - to bring solutions to marine related challenges, including salinity ingress.

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13

The actualization of a seamless urban mass transport is hatched by a slew of factors. (15m)
Identifying these factors, recommend measures to create a robust paradigm for urban mass transport.

With rising urbanization in globe
as well as India (currently 32%,
expected to increase to 50% by 2030)
the need for seamless urban mass
transport is paramount — to ensure
EASE OF MOBILITY.

The factors affecting urban mass transport

- ① Infrastructure development
↳ of roads, railways, airways.
- ② Budgetary allocations
eg PM Gati Shakti allocated huge finances.
- ③ Linking hinterlands
eg rural affected areas.

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④ Quality of roads.

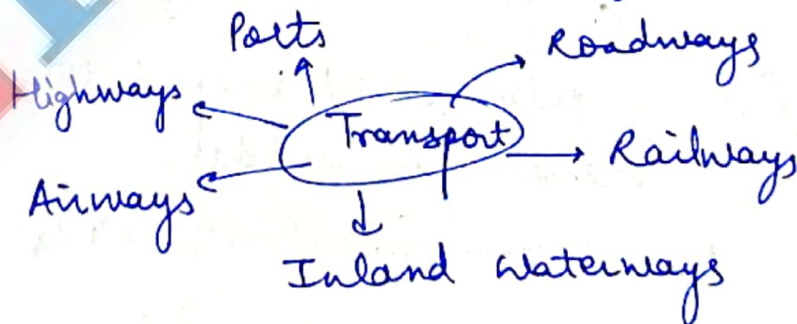
- ↳ potholes develop during rainy season. eg Mumbai
- ↳ slumping of newly constructed highways eg Bundelkhand expressway within 1 week of inauguration

⑤ Last Mile connectivity.

- ↳ to enable efficient delivery of goods & services.
- ↳ ease for tourists to travel.

Robust paradigm for urban mass transport

① Multi Modal connectivity



② Climate friendly transportation

- ↳ use of electric vehicles

Answer Questions in NOT MORE THAN the Word Limit specified for each in the Parenthesis.
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- ↳ hybrid engines (conventional + EV)
- ↳ Green Hydrogen as fuel.
- ↳ Ethanol Blended petrol.

for SUSTAINABLE MOBILITY.

- ③. Reduce cost of travel
- ↳ to reduce logistics cost
 - ↳ boost industrial growth & exports

- ④. emphasis on public transport as well as private entrepreneurship
eg. Elon Musk's driverless cars.

- ⑤ Transport suitable for vulnerable
 Physically challenged → Old Aged
 eg. Suganya Bharat Abhiyan.

- ⑥ Safety in transportation - for women & children
 eg. women conductors, CCTVs.

Hence, Holistic Transformation of urban mass transport is needed.

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14

The economic & strategic significance of mineral wealth of a country cannot be seen in isolation from associated socio-ecological impacts of their extraction. Discuss in light of new found lithium reserves in Northern India.

(15m)

Mineral wealth of a nation boosts its economy through industrial growth as well as increase in people's standard of living.
⇒ use of EVs for transportation.

Economic Significance of Mineral Wealth

- ① helps in industrialization
⇒ semiconductor industries
- ② smart transportation
⇒ Electric vehicles using lithium.
- ③ exports of minerals helps earn forex and improve balance of payment
- ④. revolutionize industrial growth & GDP. ⇒ Iron & steel industry as backbone of economy

Answer Questions in NOT MORE THAN the Word Limit specified for each in the Parenthesis.
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Strategic Significance

- 1) Discovery of Lithium reserves in Raesi district of Jammu & Kashmir add to national mineral wealth.
- 2) decrease dependence on foreign nations → Chinese lithium
→ import of oil
- 3) push to Indian 'self reliance', i.e. Aatmanirbhar Bharat.

Social impacts of mineral extraction

- ① employment of child labour in such mines → easy to get inside smaller areas of vat hole, Meghalaya mining
→ violation of Article 23 & 24, right to dignity.
- ② Displacement of tribals → rehabilitation & compensation issues of Bauxite mining in Odisha.
- ③ Health impacts on workers of Silicosis

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कृपया इस स्थान में प्रश्न संख्या के अतिरिक्त कुछ न लिखें।

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- ④ rise in distress migration
- ⑤ But, positively boosts employment opportunities as well.
- ⑥ women get to work

Ecological impacts of mineral extraction

- ① Pollution - due to release of harmful gases during mining
- ② waste dumping into oceans.
- ③ Greenhouse gases released - add to global warming.
- ④ further leads to acid rain.

Hence, we need to focus on

- sustainable methods of mineral extraction
- global collaborations w/ Argentina
- R&D in mining
- increase in financing & manpower

All this will translate & metamorphise mineral wealth into Nation's wealth to achieve landyplan.

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15

Examine the reasons behind generation of regional sentiments? Do you agree that regional sentiments & cultural assertiveness may lead to the issue of separatism?

(15m)

"Regionalism is the ultimate aim, nationalism takes a back seat."
— Christophe Jafflot

When we talk of regional sentiments, the emphasis is on local issues & concerns over national interests.

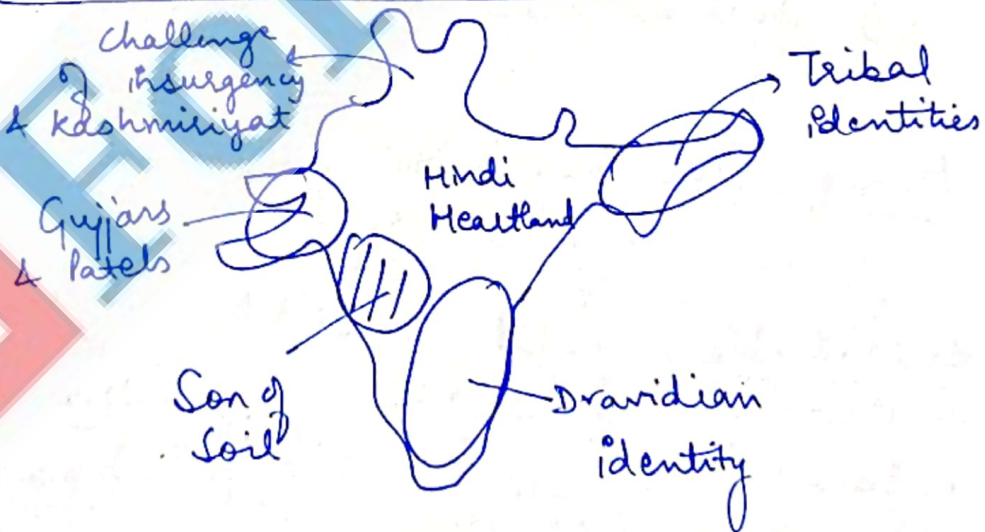


Fig: Regionalism in India

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Reasons behind regional sentiments

- ① Historical - Divide & rule policy of British
- world wars influence on Germany
- ② Political - vote Bank politics
- polarization of voters on regional issues.
- ③ Ethnic - difference in cultural identities & practices.
e.g. North East tribes of Kuki, Meitei, Nagas, clash with Bengalees
- ④ Developmental differences -
poverty, unemployment, hunger
e.g. Naxal affected areas.
- ⑤ Linguistic - Dravidian movement in opposition to Hindi.
- ⑥ Son of Soil movement
e.g. Marathi identity.
- ⑦ Resource differences and disputes
e.g. Cauvery water dispute

Regional Sentiments Leading to Separatism

- ① excessive polarization
- ② see mutually exclusive interests.
- ③ role of foreign actors
⇨ China and Pakistan in NE and Jammu & Kashmir.
- ④ leading to violence
⇨ Khalistani movement.
- ⑤ narrow interests. ⇨ communalism.

However, regionalism also enhances solidarity as →

- ① variety of festivals celebrated show diversity
⇨ Holi, Diwali, Christmas together.
- ② binding force of 'English'.
- ③ regional cinema rise
⇨ RRR, Bahubali unites nation
- ④ idea of unity without uniformity & diversity without differentiation.

Hence, as ^{PM} Modi says :

"we are different 'suns' forming a beautiful saga."

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16

Explain the mechanism & occurrence of earthquake.
Throw light upon vulnerability of regions affected by earthquake & earthquake related disasters.

(15 m)

Earthquake refers to release of energy in form of SEISMIC WAVES - causing damage to life & property

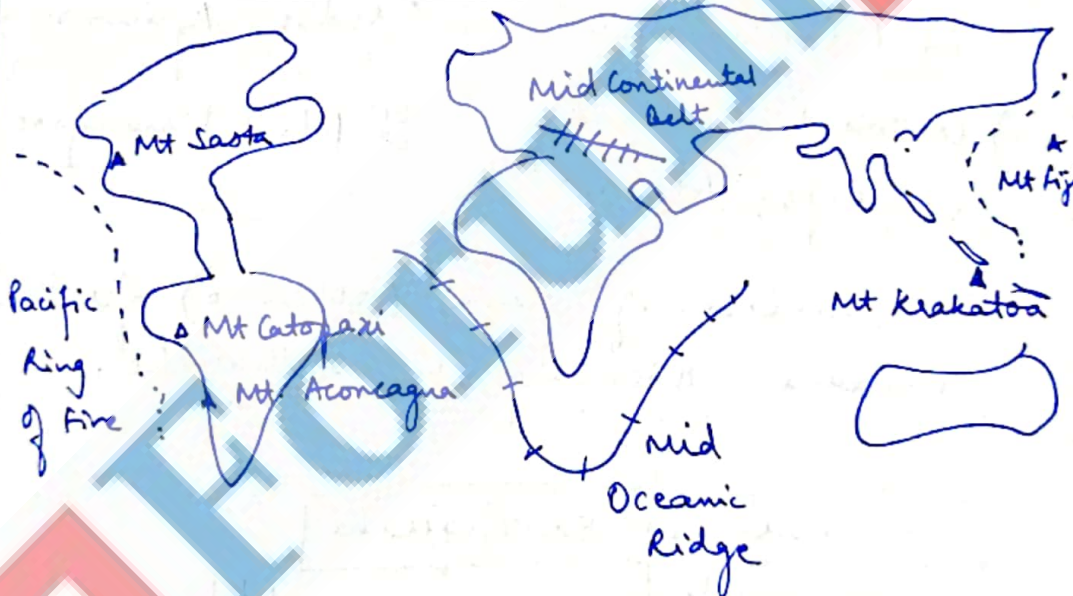


Fig: Earthquake prone areas

Mechanism of earthquake :-

The energy released is due to 2 reasons -

- 1) primordial heat of earth
- 2) radioactive energy in earth's crust

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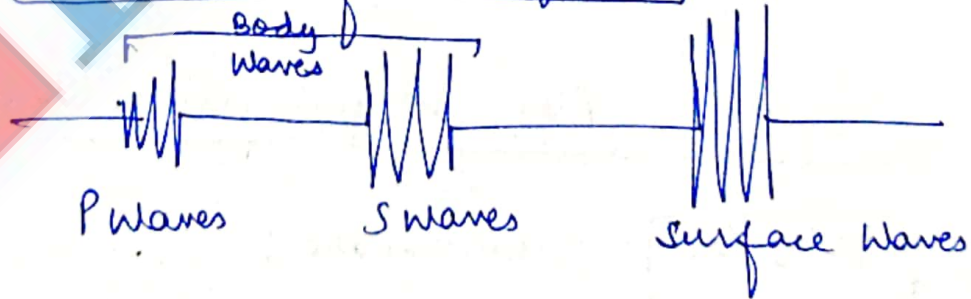
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The Plate Tectonics Theory explains how lithospheric plates move and collide, leading to 2 forms of plate movements, that cause earthquakes.

- | | |
|---|---|
| <u>Convergent</u> | <u>Divergent</u> |
| 1) Oceanic - Continental
≡ Mt. Acancagua | forms mid atlantic ridge, African ridge |
| 2) Continent - continent
≡ Alps, Atlas | ≡ Mt. Kilimanjaro |

The release of lava (volcano) further increases intensity of earthquake.

Occurrence of earthquake



- | | | |
|----------------------|--------------------|-------------------------|
| - First to arrive | - second to arrive | - last to arrive |
| - least destructive | - transverse waves | - most destructive |
| - longitudinal waves | | - interact with surface |

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The occurrence is measured by Seismograph which records waves & their intensity on Richter Scale.

Vulnerability of earthquake prone regions

① Region wise

↳ 80% earthquakes in Circumpacific belt.

↳ 15% in Mid Continental Belt.

↳ 5% in Mid Oceanic ridges.

② Impact wise (eg Recently in Turkey)

Economic

- infrastructure destruction
- damage to transportation lines
- loss to GDP

Social

- loss of lives
- forced migration
- women, children, old age most vulnerable

Ecological

- forests uprooted
- main ecosystem disrupted
- loss of biodiversity

Earthquakes are a 'Bad news' as they lead to destruction, but we need to ensure EWS, Zone Mapping, preventive steps, resilient buildings to minimize impact.

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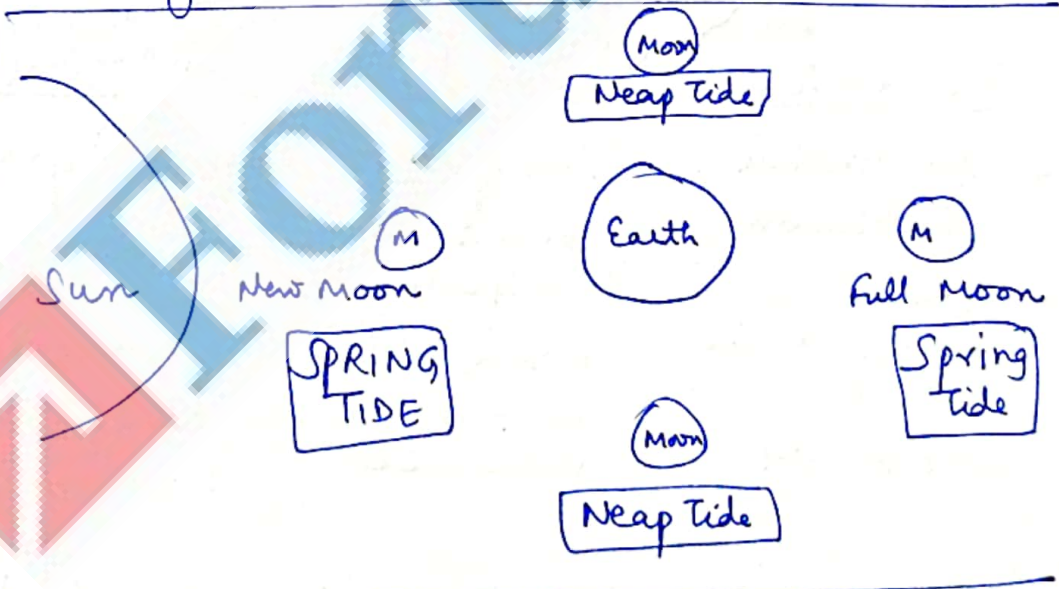
17

Enumerating different types of tides highlight their significance. Also, explain how tides are different from waves.

(15m)

Tides are the periodic rise and fall of water due to the gravitational pull of sun & moon vis - a - vis the earth - usually twice a day.

Types of Tides



① Spring Tide - formed when Sun, Moon, Earth are in straight line, during new & full moon.

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- The Tidal Range is the highest

② Neap Tide - when gravitational forces of Sun & Moon counteract thus, reducing tidal range to its minimum.

Significance of Tides

① Aid Navigation - as easier to move ships at high tides
↳ boost trade.

② Help Clean Coasts - as the polluted waste carries along tides, also desiltation.

③ Tidal energy - renewable & sustainable source of energy.

④ can cause disaster - if intensity of rise & fall exacerbates = flood

⑤ bring essential nutrients & fisheries from deep ocean to coasts - help fishermen livelihood.

⑥ Aquaculture.

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कृपया इस स्थान में प्रश्न संख्या के अतिरिक्त कुछ न लिखें।

Difference :-

Tides

Definition: periodic rise and fall of water

Reason: gravitational force of moon & sun

Frequency: usually twice a day

Impact: Huge and visible

Motion: Rise & fall

Movement: water

of Neap Tide & spring tide

Yet, Both are crucial component of ocean ecology.

Waves

movement of energy in water

wind action and frictional force with water.

anytime, very irregular.

can be insignificant and localized ripples

circular motion (in gyre)

wave energy

of steady waves & steep waves

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18

With special reference to India, elucidate how globalization - a multifaceted phenomenon - has had positive socio-economic outcomes on one hand & widened gaps between haves & have nots on the other?

(15m)

Globalization enhances integration, interconnectedness & interactions among goods, services, ideas, people, technology.
— Milton Friedman

Globalization is a multi faceted phenomenon influencing all spheres of life.

I. Positive Socio Economic Outcomes

Social

1) more opportunities for women of Going Online as Leaders (GOAL) with facebook

Economic

1) Better employment opportunities to workers, students of in Middle East, Silicon valley.

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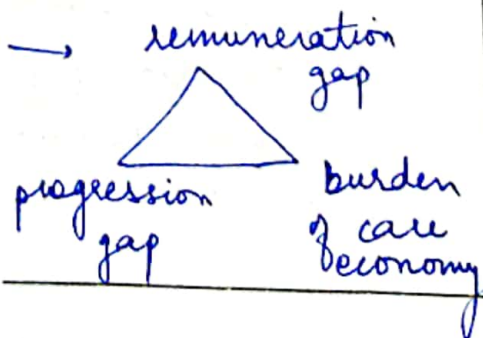
- 2) Empowerment of Tribals
⇨ e-Haats
- 3) Increase in reach of interactions
⇨ through vlogs
- 4) Better education opportunities for students
⇨ in London Cambridge
- 5) More communication & closer families
⇨ through video calls.

- 2) raise exports of a nation - add to forex reserves, better current account balances
⇨ to Africa
- 3) competitive advantage can be harnessed
⇨ Diamond industry in Surat - exports to UAE
- 4) raise e-commerce
⇨ Mobitech: Uber
Food Tech: Swiggy

However, it widened gaps between

haves & have nots as -

Gender Gap :-
① Women still face (even worse are transgenders)



② Rural - Urban gap:

Internet connection or smartphone use → hardly 30% in rural & over 70% in urban.

③ Digital Divide

Digital illiteracy still at 90% in India

④ Vulnerability

to crimes → to frauds
of online sexual abuse, Bullibai app → of dupping money

⑤ Rise in Inequalities:

Oxfam Time to Care report says: -
Top 1% owns 70% wealth
and Bottom 50% owns mere 3%.

⑥ Rich versus poor

Rich getting richer & poor poorer
of around 22% poverty in India

⑦ Brain Drain - hamper demographic dividend.

Hence, globalization is a double edged sword.

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कृपया इस स्थान में प्रश्न संख्या के अतिरिक्त कुछ न लिखें।

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19

What makes India one of the most vulnerable regions to climate change?

(15m)

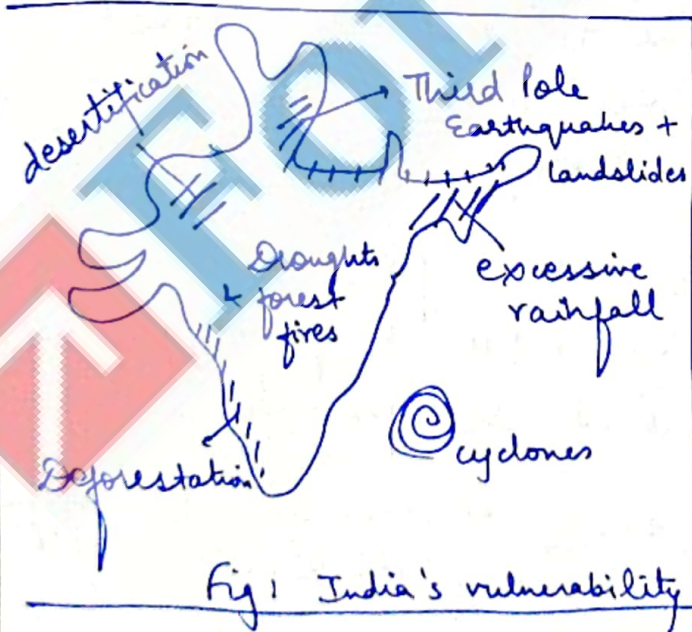
Discuss the role of governments, citizens and businesses in building climate resilience.

India's vulnerability to climate change is evident from the figures of rise in greenhouse gases

150% increase in CO₂ (419 ppm)

123% increase in nitrous oxide

260% rise in Methane



Reasons for India's vulnerability

① Himalayas:-

melting of glaciers & ice caps due to unplanned urbanization,

excessive rainfalls/cloudbursts, avalanches, landslides.

UPSC

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कृपया इस स्थान पर केवल प्रश्न संख्या ही लिखें।

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② Western Ghats → unsustainable infrastructure growth (eg: Konkan railways) leading to landslides & erratic monsoon

③ Vast coastline of 7500 km → susceptible to extreme weather events + threat of coastal submergence

④ Geo-climatic location of India - Tropical nation with numerous rivers = leading to floods.

The vulnerability to various disasters is

```
graph TD; India[India] --> Earthquakes[70% earthquakes]; India --> Drought[68% Drought prone]; India --> ForestFires[36% forest fires]; India --> Floods[12% floods]; India --> Landslides[13% landslides];
```

To build climate resilience, concerted efforts are needed of :-

- ① Governments - collaboration of Center and State government
- ensure preparedness & preventive measures

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कृपया इस स्थान में पत्र संख्या को अतिरिक्त कुछ न लिखें।

- ⇒ climate resilient infrastructure
- enhance investments in governance
- ⇒ National Disaster Relief Fund.
- collaborate with other countries
- ⇒ learn from Japan

- ② citizens → to be cautious & proactive
- mock drills against disasters.
 - behavioural change to reduce global warming.
 - ⇒ reduce ACs use.
 - change vehicles to EVs, public transport

- ③ Businesses
- utilize CSR funds to build climate resilience.
 - change business plans to ensure ESG guidelines are abided by
 - ⇒ Adidas reused plastics to make shoes.

Hence, with coordination & collaborations we can ensure trinity of



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20

All deserts are rain deficit, but are formed due to different reasons. Discuss. Also, analyse various adaptations in flora & fauna to survive water deficit conditions.

(15m)

Desertification is the phenomenon of rapidly increasing drylands, i.e. arid and semi arid areas.

All deserts are rain deficit as:-

Evaporation > Precipitation

leading to decline in water availability to less than 25 cm.

Yet, they are formed due to different reasons as

Hot Deserts

Cold Deserts

- ① Offshore Trade Winds of Sahara desert
- ② in Sub Tropical High pressure belt
- ③ Dissipating effect of cold ocean currents of Patagonia desert

- Due to leeward side, i.e. rain shadow effect of Gobi desert in China

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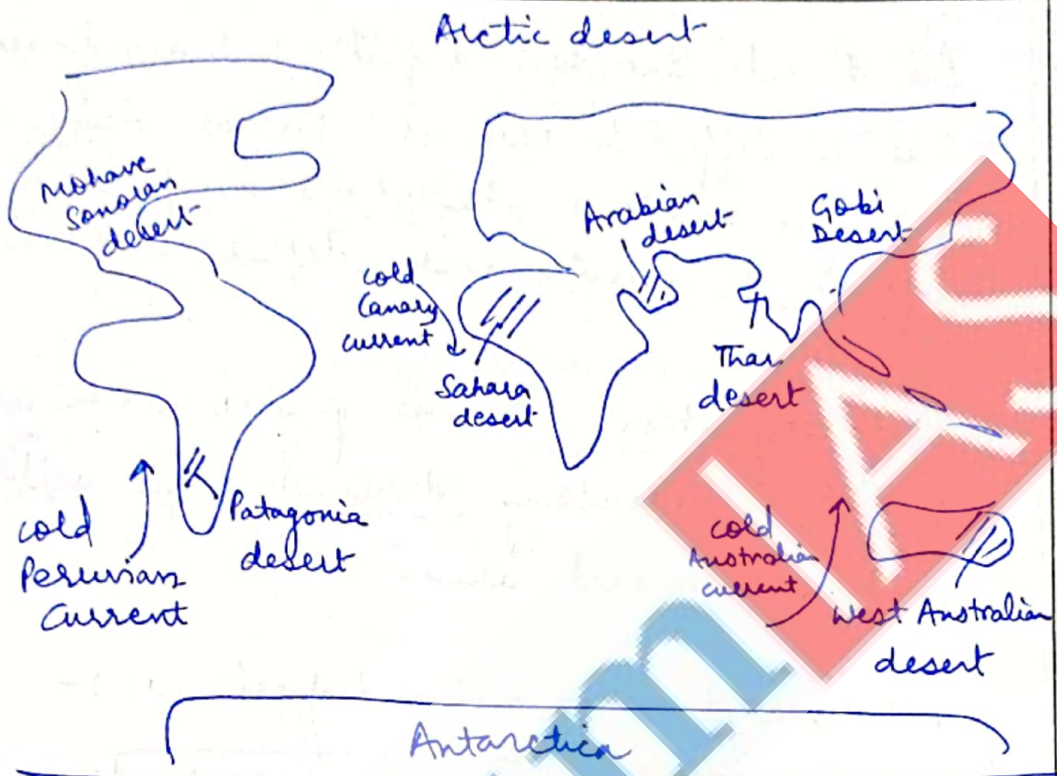
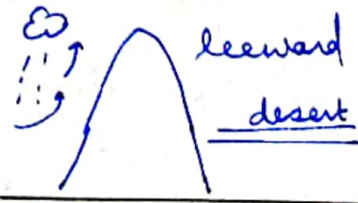


Fig. Deserts

Hence, we can see that hot deserts are formed between $\Rightarrow 20-30^\circ N \& S$ i.e. sub tropical belt, along western side of continents.

Also, presence of mountain ranges act as barrier to moisture laden winds, causing deserts to form

presence of Rockies as obstruction forms Sonoran desert



Adaptations in water deficit conditions

In flora

eg CACTUS, BABUL, ACACIA

① have toeny projections in place of leaves to save water from evapotranspiration.

② have longer roots to go deeper in soil in search of water.

③ have sunken stomata on lower sides of leaves

④ fleshy & thick stems, waxy coating to save water.

In fauna

eg CAMEL, RATS, SNAKES

① Camel has hump back to store water.

② reduced metabolism to reduce water loss (via urine)

③ larger surface area of body to cool them.

④ are nocturnal and live in Burrows.

Hence, nature has given ways to flora & fauna to survive in harsh conditions.