

**UPPSC MAINS 2024 - CRASH COURSE****Generic Booklet**

Test Name/Code/No. : 7712232 Geography Section Test

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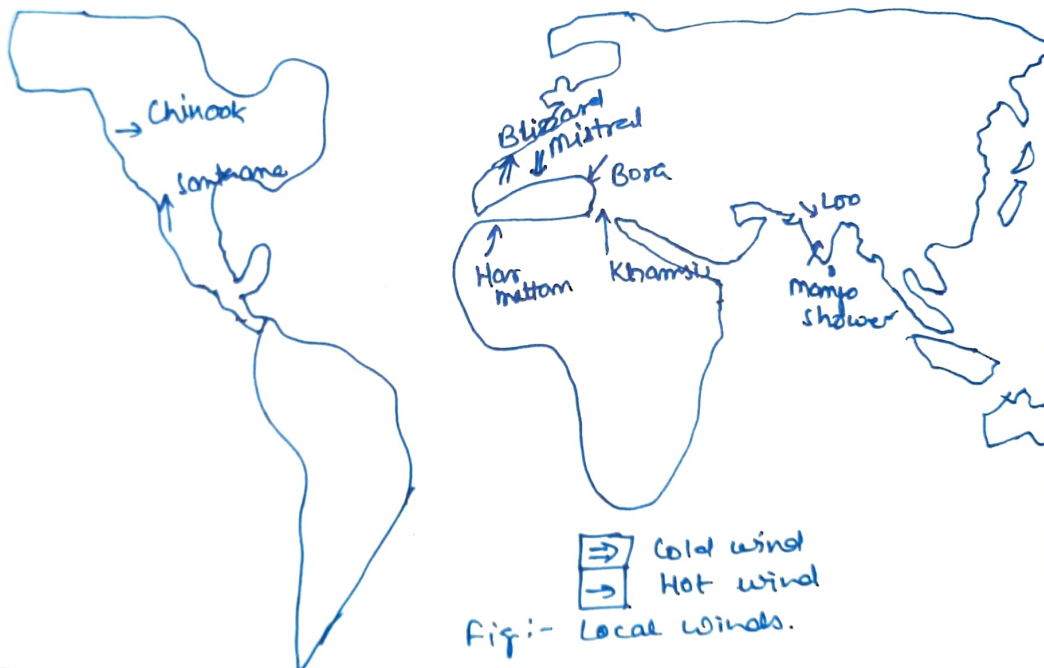
Allotted Time : 90 Minutes**Instructions to Candidates -**

- There are 10 Questions in this Question paper.
- All Questions are Compulsory.
- Answers must be attempted in the QCA Booklet only.

Q. No.	Grade/Score
1	
2	
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Overall Grade/Score	

Q.1) What are local winds? discuss their impact on associated regions, citing examples from different parts of world.

Ans:- Local winds are seasonal or blow in a specific regions of world with distinct characteristics like cold, hot etc.



Impact on regions:-

- (1) Warming effect - melt glacier and grow biode of vegetation and beneficial for agriculture
 Eg - Chinook (hot wind) in USA melt ice over Rockies.

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(2) Chilling effect and change of climate -
Cold wind give drying and chilling effect
Eg → Mistral in France

(3) Regulate weather - local wind with inherent property create weather
Eg - Hot dry wind from Sahara blow toward Europe and create dusty weather.

(4) Health effect → Loo in India blow from Punjab towards gangetic plain cause heat strokes.

(5) Beneficial for agriculture → Mango shower in Kerala, help in riping of mango.

Thus local winds play crucial role in effecting weather and climate of region and pose challenge as well as benefits. also.

Overall Grading (✓)

Poor			Average			Good		
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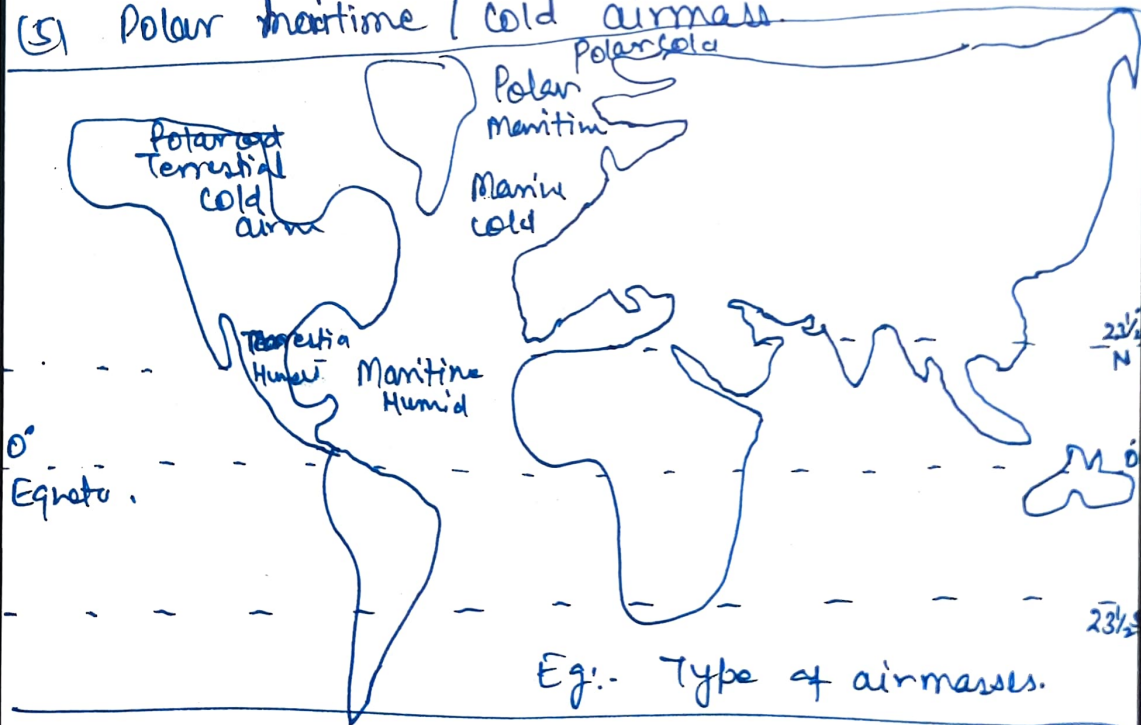
11 min.

Q.3) Explain the concept of air mass. How does it influence the weather condition of a region?

Any Air mass is a vast body of air with homogeneous characteristic influence over a large area of land. It can be cold or hot air mass, help to form temperate cyclone in Sub tropical regions.

Types of Air Mass

- (1) marine hot/humid air mass.
- (2) marine cold air mass.
- (3) Terrestrial humid air mass
- (4) Terrestrial cold air mass
- (5) Polar maritime / cold air mass.

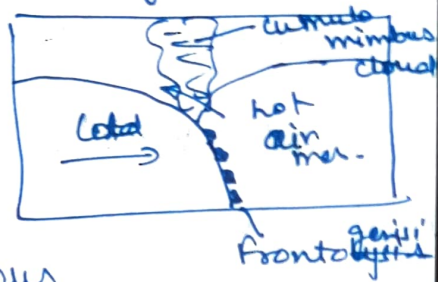


(Do anything)

Influence on the weather of region

(1) frontogenesis ^{genesis.} → Hot or cold air mass move toward each other and powerful one (cold) carry the hot air mass carry over it

(2) When hot air mass completely covered by



Cold mass Cumulonimbus cloud form and huge amount of rain occur with longer time and temp. of region decrease as per the cold air mass.

(3) formation of Temperate cyclone → when two or three different air mass come together again front form and start a war of air mass with the low pressure are get into cold air mass and form temperate cyclone

Thus air mass impact huge on large area climate and cause huge floods in USA and some-time very chilling cold with effect of air mass.

Overall Grading (✓)

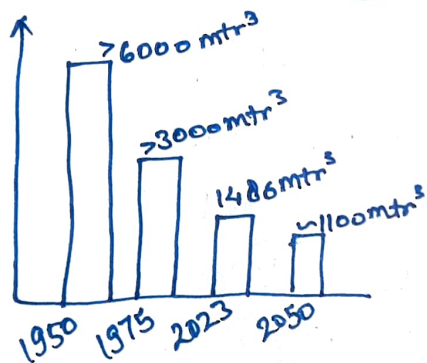
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13min

Q.4) What is meant by water stress? Why is there variation in water stress in regional level in India?

Ans- Water stress refer to a condition where water availability get decreased to a level which pose difficulty to residents and farmers unable to get sufficient amount of water for irrigation.

Status of water availability



Water availability per capita in India

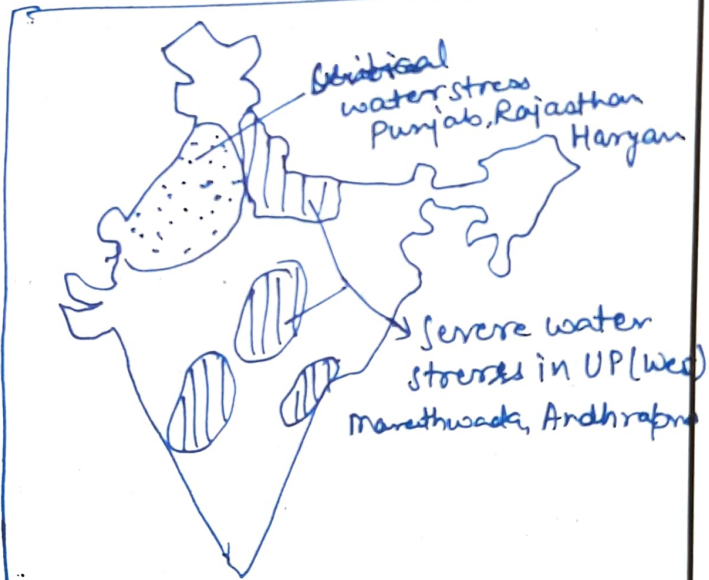


Fig:- water stress in India.

Reasons for variation in regional level:-

(1) High use of ground water - Punjab and Haryana with advent of Green revolution draw excessive ground water → decrease

(Do anything)

in water table to critical level.

- (2) Government policies → free availability of electricity for irrigation.
- (3) Tubewell and Submersible pumps - easily installing tubewell in Gangetic plain and surrounding area.
- (4) Topology of Terrain → other areas like Maharashtra, Telangana, rocky terrain pose challenges to make borewell.
- (5) Water guzzling cropping pattern → Rice wheat and Sugarcane plantation need high water. Eg - India is net water exportable country.
- (6) Mono cropping due to MSP → led to high use of water.
- (7) Industrial use and high population for domestic use

Thus govt need to focus on policy change to get sufficient ground water recharge for the sustainable development

Overall Grading (✓)

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12 min.

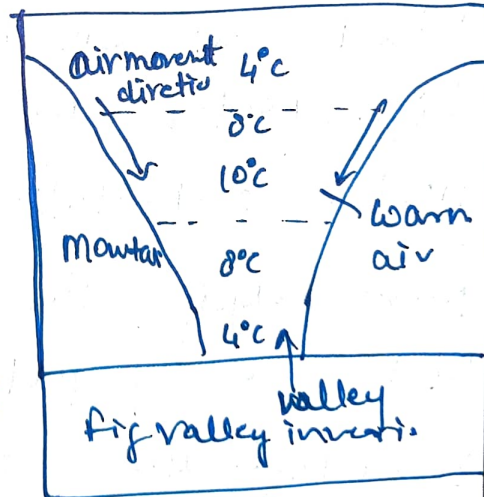
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Q.5) Explain the concept of temperature inversion, incl the conditions under which it occurs. How does it affect the weather and the inhabitant of the place?

Ans Temperature inversion is a condition in which warm air gets trapped between the cold air and with the increase in height temp. get increase instead of decreasing.

Types of Temperatur inversion and Condittons

(1) Valley inversion:- due to cold weather, clean sky and differential cooling of surface led to mountain ground of valley cool faster than air.

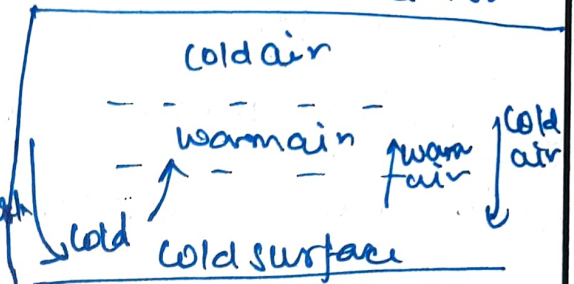


which led to cold air move toward valley and warm air get uplifted and create inversion conditton.

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(2) Subsidence of air →

due to cold temp and clear sky, terrestrial heat radiated back quickly and surface get cold rapidly and create condition of subsidence air



(3) Ground inversion :- almost similar to subsistence of air pattern occur in colder region and create foggy weather.

(4) Frontal inversion :- when warm front meet cold front and get uplifted due to cold front movement and frontogenesis. inversion condition created.

Impact on climate -

- foggy weather
- Rain moderate
- Trapping of pollution
- frost bite on slope of mountain

Thus Temperature inversion create a condition of inverse of normal and change the climate rapidly.

Overall Grading (√)

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11 Min.

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Q.6) Briefly describe the process of tide formation and differentiate between tides and wave.

Ans:- Tides are the vertical movement of ocean water due to the gravitational force and of Moon and sun, coriolis force of earth also help in formation.

Process of Tides formation

(1) When sun moon and earth comes in one line it creates high and low water tide due to

strong gravitational force. It happen on full moon and New moon day.

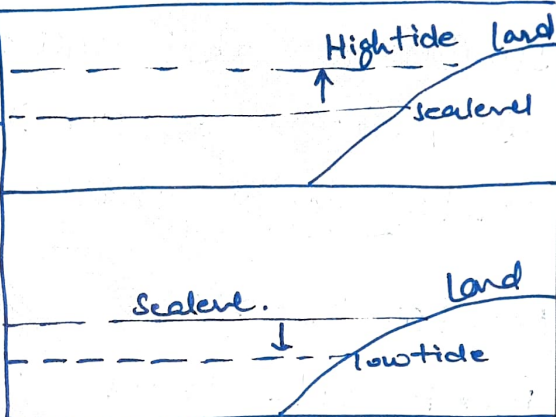
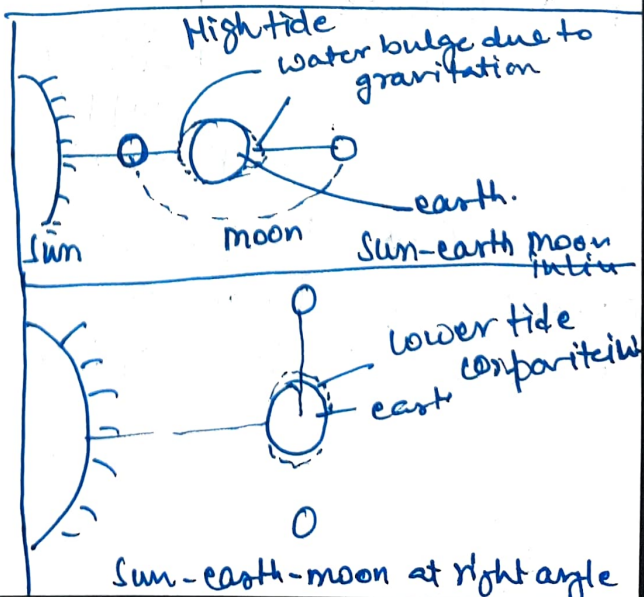


Fig:- Tides in ocean.



(2) Low Avg and Any low high tide → when moon and sun at right angle with earth then both gravitational force ~~center~~ cancel other force which but due to moon proximity to earth, moon push high gravitational than sun. So it create comparitively lower low and high tide. It occurs on neap tide.

(3) Average high and low tide → formate on the crescent moon during waxing and waning.

Differentiate between Tide and Waves

Tide	Waves
(1) <u>Vertical movement of water</u>	<u>Horizontal movement of water</u>
(2) <u>Due to sun and moon gravitational force.</u>	<u>No impact of sun moon gravitational force.</u>

(3) No impact of wind

- Form due to wind friction.

(4) No impact of ocean current and salinity.

- Influence due to current of ocean and salinity.

(5) Daily 2 high and 2 low tide at interval of 6 hrs. few min.

- No regular interval rather based on wind speed.

(6) High influence on navigation of merchant ships.

- No impact on shipping.

(7) Regulation of water and clear pollution from port.

- No such impact on regulation on water movement

Benefits of Tides

→ Revivine port entry and exit of vessels.
Eg - Kolkata port.

→ Water movement and high tide are dangerous during monsoons as cause Tidal bulge and flooding in low areas.

Thus Tides play very important role in daily life and marine ecosystem and can be harness Tidal energy with technology.

Overall Grading (✓)

Poor			Average			Good		
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Q.7) Discuss the conditions favorable for the formation and intensification of Tropical cyclones. also explain how they differ from extra tropical cyclones.

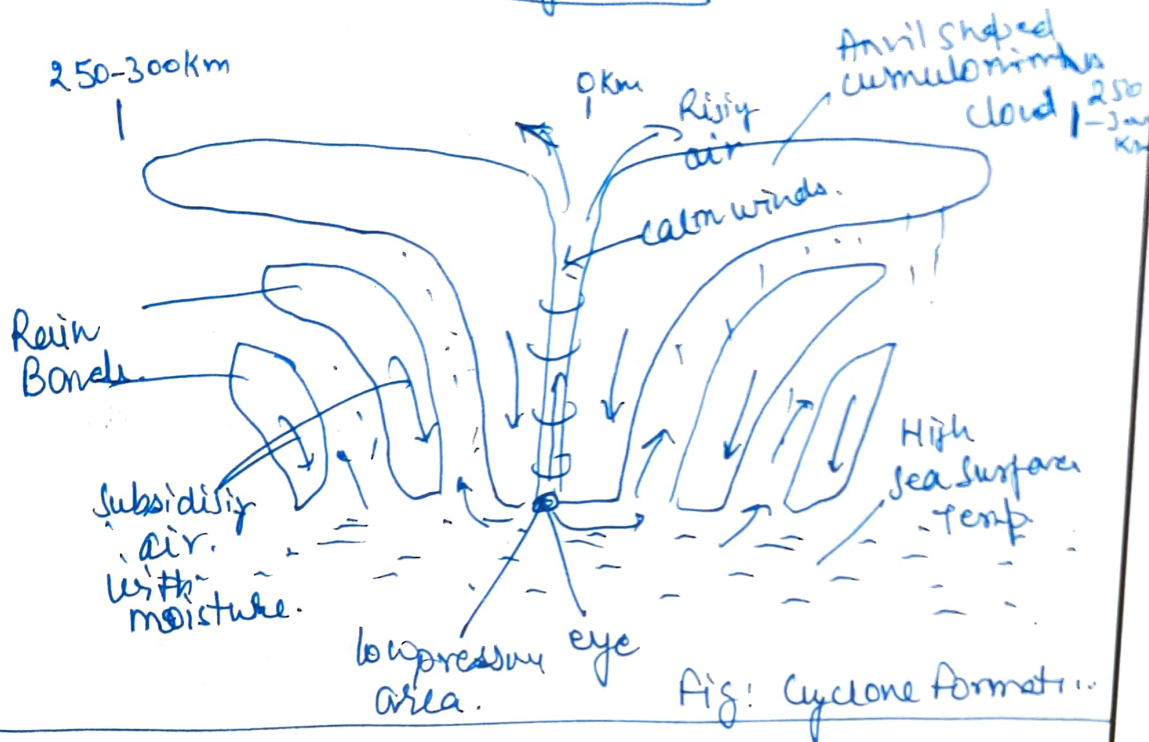
Ans Indian, Odisha, West Bengal and Andhra Pradesh coast is highly vulnerable to Tropical cyclone originated in Bay of Bengal during the late summer of August to October months.

Favorable conditions for formation of cyclone :-

- (1) High sea surface temperature - $>27^{\circ}\text{C}$
- (2) Calm wind shear with little vertical variation.
- (3) Relatively low pressure
- (4) Coriolis force and formation of depression.



Formation of Tropical cyclone:-



Cyclone genesis in few stages.

Stage I - Relative calm wind and low surface pressure and high temp with availability of moisture and enough coiolis force in 15-30° N/S latitude.

Stage II → left over cyclonic dipression or sumergt air due to low pressure and rise of speed due to coiolis force and formation of cloud with multiple bands.

Stage III → Circular motion with moving in Right direction and high incidence of rain.

Stage IV → formation of cyclone or severe cyclon

(Do anything)

based on wind speed.

Stage dissipation stage with fall on land as moisture supply cut off.

Difference between Tropical and Temperate cyclone

Tropical cyclone	Temperate cyclone
(1) Originated due to low pressure on sea and high surface temp.	Originated due to front formation
(2) Between <u>15-30° N/S</u> latitude of Tropical area	Above <u>30-45° N</u> in mostly USA.
(3) Only originated on sea, <u>dissipated on land</u>	Can originate both place dissipate when <u>frontolysis</u> .
(4) High wind and cause severe destruction	Destruction due to <u>flood</u>
(5) <u>Rain</u> could be <u>upto 3-4 days</u>	<u>Rain</u> upto <u>2-3 weeks</u> .
(6) <u>Eye</u> a central calm area	<u>No eye formation</u>

Thus cyclone are vary in their formation as per condition of temp, moisture and latitude.

Overall Grading (✓)

Poor			Average			Good		
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20min

Q.8) Why do middle gangetic plains remain relatively underdeveloped despite having abundant water resources, fertile soil and favorable geography.

Ans:- India's middle gangetic plain areas consist eastern part of UP, Bihar and West Bengal marred with high poverty, malnutrition, underdevelopment.

Characteristic of Middle gangetic plain:-

- ↳ Fertile plain
- ↳ Abundance of Minerals
- ↳ Rich Biodiversity
- ↳ High population
- ↳ Agriculture area
- ↳ Flood prone
- ↳ Surplus water availability.
- ↳ High migration from area
- ↳



Fig: Middle Gangetic Plain.

Reasons for Underdevelopment

- (1) Sub-par industrialisation - little or no industrial investment due to govt neglect.
- (2) High flood prone region → Annual incidence of flooding in Repti, Ganga, Kosi river
- (3) High population → small agriculture field
 low mechanisation. ← low income and farm distress. ← low economy of scale
- (4) Conflict zones → Left wing extremist region → ~~no~~ conflict and violence → Little investment opportunities.
- (5) High illiteracy and awareness → Bihar in whole India lowest literacy < 50%. (2011 census)
- (6) Private investment and govt unpredictable policy led to poor investment.
- (7) Socio-cultural factor - Gender discrimination, caste and religious hierarchies, Religious intolerance etc.

Ways to improve ^{situation}

- (1) Socio-economic Reforms - Quality education, healthcare and sanitation. clean water availability - Jal Jeevan mission
- (2) Attract investment → Ease of doing business by creating infrastructure, connectivity to remote areas, clearing licences and single window approval of projects.
- (3) Boost local manufacturing → skill development and cottage and small industries - One district and one product
- (4) Push for food processing industry - Makhana Board, Millet cultivation and storage and warehousing facilities.
- (5) Entrepreneurship and risk taking.

Thus Gangetic plain can be engine of growth in the Eastern India by applying right strategy and reform in structural bottlenecks.

Overall Grading (✓)

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17min

Q.9) Rare earth elements are rightly referred as Vitamins of modern Industry; but their uneven distribution across the world has wide ranging implication. elaborate.

Ans:- Rare earth elements are group of more than 30 minerals which are crucial for modern technology but found in small quantities with wide spatial variation.

Resource Regions of Rare earth minerals

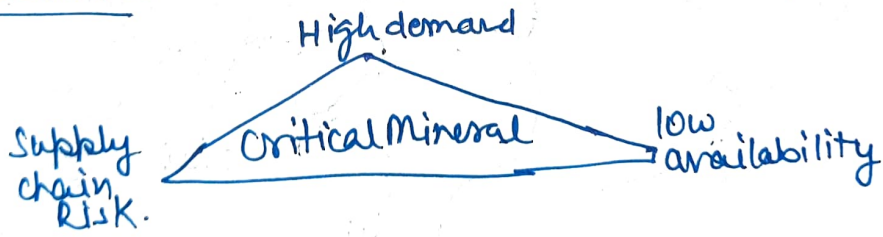


Fig:- Rare earth minerals.

Rare earth mineral as Vitamins of modern Industry:-

- ↳ Crucial for Electronic equipment
- ↳ Semiconductors, chips and transistors
- ↳ Electronic vehicle
- ↳ Solar panel and Wind Turbine
- ↳ Digital and Communication systems.
- ↳ Mobile and Battery storage.

Implication due to uneven distribution

- (1) Monopolistic trade → >90% REE processing and ~80% availability in China → restricted trade.
- (2) Risk of modern technological change → due to strained availability.
- (3) High demand → make in critical mineral.

- (4) Trade war and tension in countries → due to weaponisation of mineral supply.
- (5) Crucial for transition toward sustainable energy generation and e-vehicle adoption

Wdly Forward

- Global collaboration to meet each other demand → Critical mineral → Supply chain resilience.
- Develop processing capability in domestic area → as India 5th largest reserve of rare earth elements.
- Improve supply chain with diversification of import destination.
- Investment in exploration and extraction in major regions of world → China hold 90% cobalt reserve in Congo.
- Invest in Research & Development → India 0.6% R&D budget lowest among China (2.5%), US (~3%), Israel (4.5%)

Thus govt need to locate regions of REE and develop capability of processing as well as need to collaborate for import resilience.

Overall Grading (✓)

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1	2	3	4	5	6	7	8	9

6 High

Q.10) How can the demographic transition in the southern states marked by low fertility rates and aging population, impact the region's economic growth and social welfare policies?

Ans:- India's Southern region is well developed and economically ahead in terms of socio economic indicators (MMR, IMR, ~~Age~~ life expectancy and GDP).

Demographic Transition as compared to North and East India

↳ High life expectancy vs low/moderate

Eg- South → > 75yrs.
North → ~ 65yrs.

↳ Low poverty → only 5-7% population is

under below poverty while in North and East > 15% population under poverty.



Southern India → Andhra Pradesh
Karnataka
Telangana
Tamil Nadu

Fig: South Indian States.

- ↳ High skill and education outcome → Technical education with high output and low dropout ratio.
- ↳ low fertility → Almost all south state achieve replacement ratio few below it while in North → UP - 2.3, Bihar ~ 3.0.
- ↳ Better healthcare and sanitation measures → Boost physical and mental strength → more economic opportunities.

Impact of low fertility and Aging population on economic growth and social welfare

- (1) Rise Healthcare burden → due to aging and low fertility → ^{need of} develop care economy.
- (2) Below replacement ratio of fertility → manpower shortage → decline growth.
Eg - Recently AP chief Minister urge public to have more children.
- (3) Reduction of economic growth and burden on youth :- due to rising age.

- (4) Controlled population → better monitoring and distribution of resources → Raise income and opportunities.
- (5) Optimum and sustainable utilisation of resources → to meet the current and future development needs.
- ⊕ Due to above it pose both positive and negative impact on govt and welfare policies for more improvement govt need to -
 - ↳ Invest in emerging technology for creation of better facilities and optimum utilisation.
 - ↳ Digital governance → awareness of demerits of shrinking population and delivery of services.
 - ↳ Skill development and Role models for North and rest of Indian states.

Therefore southern state need to stock the knowledge of situation and take progressive steps to maintain and raise growth of state and Indian nation.

Overall Grading (✓)

Poor			Average			Good		
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