GSSCORE

An Institute for Civil Services

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RUPAL SRIVASTAVA

AIR - 113

(CSE 2022)

GEOGRAPHY OPTIONAL

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34377 (1195)

GS SCORE

Geography Test Series 2022

TEST - 05

132

GEOGRAPHY

Time Allowed: 3 Hrs. *Max. Marks: 250*

Instructions to Candidate

- Please read each of the following instructions carefully before attempting questions.
- There are EIGHT questions divided into TWO SECTIONS and printed in ENGLISH.
- The candidate has to attempt FIVE questions in all.
- Question Nos. 1 and 5 are compulsory and out of the remaining, THREE are to be attempted by choosing at least ONE question from each Section.
- The number of marks carried by a question/part is indicated against it.
- Answers must be written in the medium authorized in the Admission Certificate which must be stated clearly on the cover of this Question-cum-Answer (QCA) Booklet in the space provided. No marks will be given for answers written in a medium other than the authorized one.
- Word limit in questions, wherever specified, should be adhered to.
- Illustrate your answers with suitable sketches/maps and diagrams, wherever considered necessary. These shall be drawn in the space provided for answering the question itself.
- Attempts of questions shall be counted in sequential order. Unless struck off, the attempt of a question shall be counted even if attempted partly. Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly struck off.

Name Rupal Srivastava

Mobile No. _____

Date _____

Signature Rupal

1. *Invigilator's Signature* _____

2. *Invigilator's Signature* _____

2

REMARKS

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Roll No. 34377

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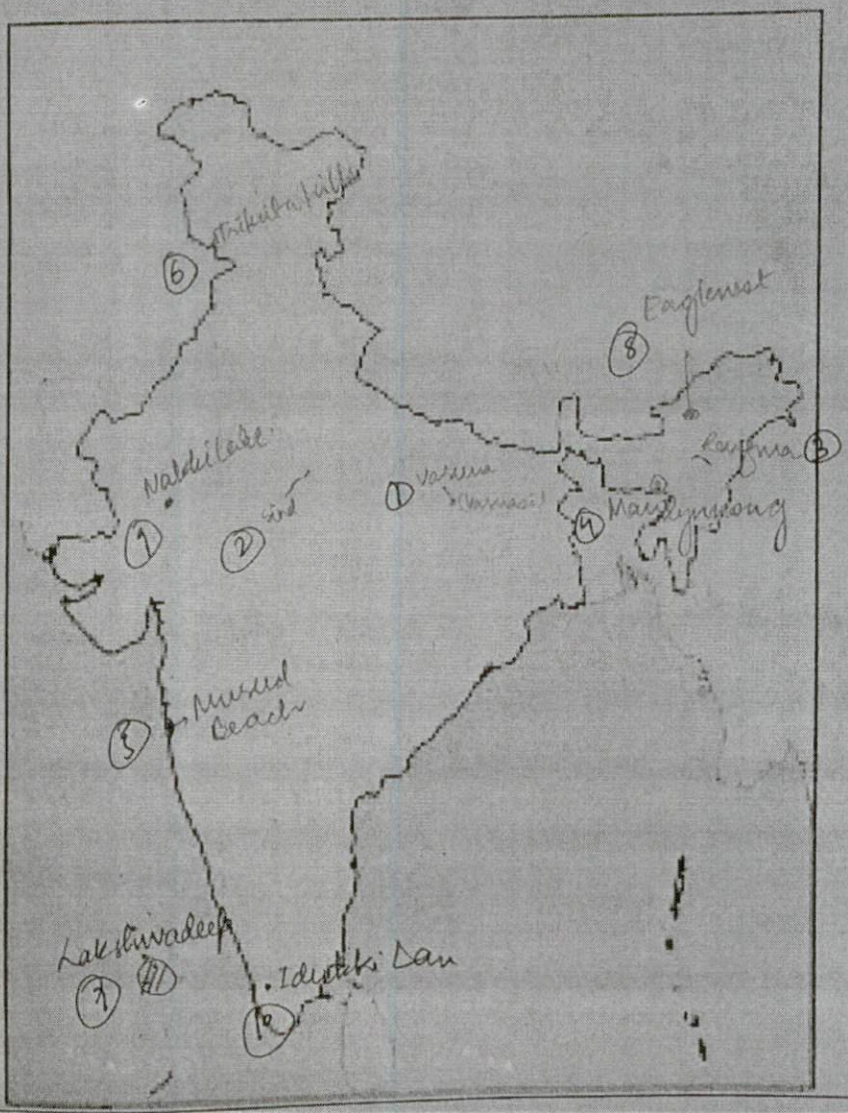
Section - A

1. (a) Locate these map entries on the map and write about 30 words: (150 Words) (10)
   1. Varuna River
   2. Sind River
   3. Rengma Hills
   4. Mawlynnong
   5. Murud Beach
   6. Trikuta Hills
   7. Lakshadweep
   8. Eaglenest Wild Life Sanctuary
   9. Nakki lake
   10. Idukki Dam



Remarks

(1) Varuna River

(a) A tributary of Ganga and joins it at Varanasi

(b) City of Varanasi - derives name from confluence of Varuna and Assi

(c) Important pilgrimage sites like Kashi Temple form tourism centres.

(2) Sind River

A tributary of Yamuna (right bank), originates in the Vindhyan Range near Kihow.

~~Flood~~ Flows through badland topography.

Gandhi Sagar Dam on confluence of Chambal and Sind.

(3) Rengma Hills

(1) Part of Naga Hills of Assam.

(2) Distributed in Nagaland and trace origin to Rengma tribes of Nagaland.

(3) Post Assam-Naga demarcation, removed from official map of Assam and renamed as Naga hills

(4) Mawlynnong

(1) Asia's cleanest village in Meghalaya

Remarks

Rema

② Near to tourism centres of Shillong, Dawki
③ Part of Meghalayan plateau which is an extension of peninsular plateau.

(5) Aswad Beach
- near Ratnagiri (Maharashtra)
- mangrove rich area - trees like Avicennia.

(6) Trikuta hills
① Gives name to 'three-mountains' thus Trikuta
② Located in its lap is the Jammu city and the Vaishno Devi Temple.
③ Extension of the Middle Himalayas.

(7) Lakshadeep
① coral island territory located between 8°N - 11°N latitudes.
② Capital Kavaratti and an important tourist destination
③ Rich coconut plantations and thus scope for eco tourism.

Remarks

(8) Eaglenest Wildlife Sanctuary
- Located near Arunachal - Bhutan Border
- Also called rainforest of the east
- Tropical evergreen vegetation due to rainfall >200 cm.
- Famous for hornbills.

(15)

(9) Nakki Lake
1. Nested in the Mt. Abu peaks near Udaipur
2. Climate relatively cooler than the average of Rajasthan (40°C)
3. Part of Rajasthan Mt. Abu Heritage Circuit

(10) Idukki Dam
1. The largest dam of Kerala, in the Idukki District.
2. On the river flowing Idukki River
3. 2019 kerala floods due to dam failure of Idukki leading of 6 lakh litre/sec water flow down the concretized slopes.

Remarks

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1. (b) Write a short note on winter rainfall in India and also write its significance to Agriculture. (150 Words) (10)

Winter rainfall constitutes around 25-20% of total rainfall of India.

The major causes of winter rainfall during the months of November to February are as follows:-

① Rainfall from NE Monsoon due to ITCZ shift

(a) Areas of Tamil Nadu - Coromondal coast (~ 110 cm average) [80% of rain]
(b) Some parts of Kerala and Nilgiri hill complex

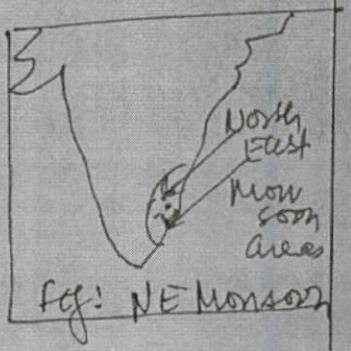

Fig: NE Monsoon

② Rainfall from Western Disturbances

(a) Due to subtropical westerly Jet stream which steers the Mediterrean depressions into India
(b) Rainfall is of temperate cyclonic nature
(c) Characterised by increased temperature due to cloud cover.

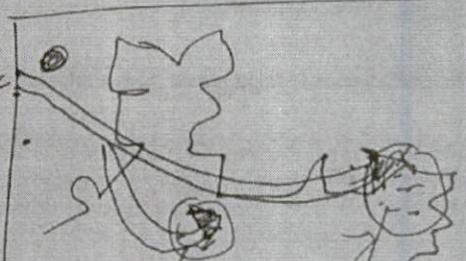

Fig: Winter rain Areas

Remarks

(3) Also due to tropical cyclones developing lately in November both in Arabian and BoB.

Significance for Agriculture

Positive

(1) Supports the growth of rabi crops like wheat in the green Evolution belt.

(2) Helps in rice farming in the Cauvery basin and Southern Sugarcane called Adsali in Cauvery delta.

Negative

(1) Changes in timing of winter rainfall towards maturation time can lead to crop damage

Eg: Jan 2022

↓

Reduced wheat yield.

To reduce the harmful impacts, Climate smart agriculture can be adopted.

4.5

* can write the Impact of winter rainfall in direct
  - Direct
    - for rabi crops
  - Indirect
    - * feeds snowfall & hence leads to water in drainage system which helps in rabi crops.

Remarks

GS SCORE

1. (c) Write a short note on climatological characteristics of Marathwada region. (150 Words) (10)

Marathwada region is the southern part of Maharashtra. Though the region is famous for sugarcane cultivation, the climate characteristics are different

Climatogical features

① Rainfall

(a) In rainshadow side of Sahyadris, thus 85-95cm rainfall

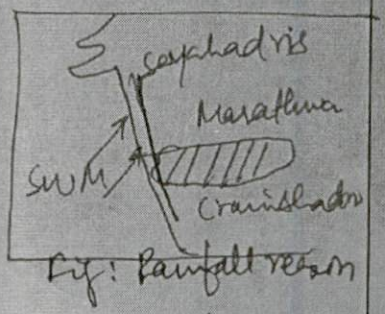

Fig: Rainfall region

(b) Also high rainfall variability (~40-60%.) leading to frequent droughts

② Temperature

Since on the rainshadow side and adiabatically compressed warm winds descend, thus high temperature of 26-27°c annually.

③ According to Koppen's classification, the region falls in the 'Bsh' type - semi arid type of climate

Remarks

GS SCORE

(iv) Disaster vulnerability to droughts

↳ Not just meteorological but also,

Meteorological
- low rainfall (<85-95 cm)

+ Hydrological droughts
- Poor ground water levels (as clayey deccan soil)

→ Agro economic droughts

wrong crop choice

e intensive irrigation

crop failure

farmer suicide (highest in India) NCRB-2019.

out migration

To develop Marathwada, diversification towards dry land farming can help.

* Add the solutions, include development of Animal husbandary
* social forestry to avoid desertification in the region
* Also provisions for watershed development in the region.

Remarks

1. (d) Briefly explain the importance of Inter-linking of Rivers in India. Also, examine the problems and prospects of the Ken-Betwa river link project. (150 Words) (10)

Interlinking idea was first proposed by Sir Arthur Cotton and then developed by K.L. Rao. It aims to transfer water from the surplus to the deficit basin.

Importance of Interlinking in India

① High monsoon variability across India. Thus can be useful in achieving inter-basin equilibrium

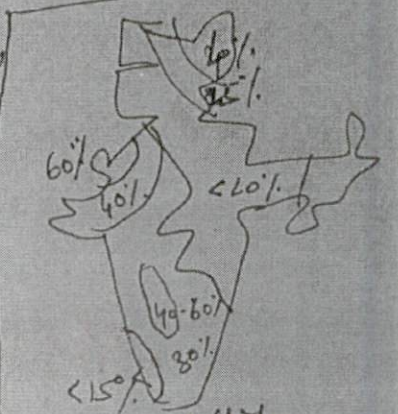

Fig. Variability

② Since agriculture is mainly rainfall dependent (Min of Agriculture only 49% irrigation development) So ensure stable crop supply

③ Create a national water grid by connecting rivers which can be developed into navigation system in future. (Deendayal Dastoor - garland scheme)

In this light, the Ken-Betwa project has been setup.

Remarks

* Also mention problem of submergence of Panna & Ranch National park due to this project

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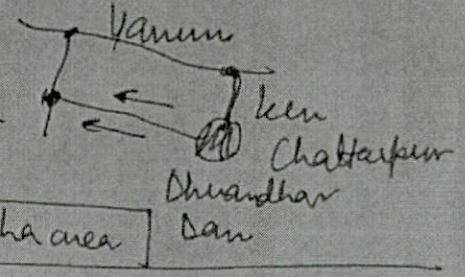
Ken Betwa Link →

Prospects



① Irrigation support to 6 lakh ha of Bundelkhand area

② Meet the water needs of 13 districts - 6 from UP (Jhansi, Lalitpur, Banda, Mahoba, Jalaun, Hamirpur) and 7 from MP - Gwalior, Chhatarpur, Panna, Tikamgarh etc.

③ Development of dams = hydropower potential = 6 ~~MW~~

Challenges * Also add economic cost of the project

① Climatically - both Ken and Betwa are seasonal rivers. Hence surplus - deficit regimes coincide

② Entire area is chronically drought prone.

③ Topographical constraints due to cratonic structure of Bundelkhand.

④ Interstate disputes in river sharing

Firstly, localised rainwater harvesting like Tankas, kunds can be explored. Then moving to interlinking can be the approach

* Resettlement of displaced people is a problem as most of tribal people will be affected

Remarks

4. (a) Discuss the Orogenesis of Himalayan Mountain ranges on the basis of plate tectonics. Elaborate with geographical evidence supporting collision of different types and nature of tectonic plates during process of orogeny. (250 Words) (20)

Himalayan Mountain orogeny began from the Tertiary times and developed through the Oligocene, Miocene, Pliocene and finally completed in the Pleistocene time. However, the procen of upliftmt is still ongoing at a smaller scale.

Plate Tectonics theory by Mackenzie and Parker can explain this 3-stage based upliftment. For India, explaination was offered by Kehdiratta and Tiwary using PT theory.

I Stage (70-65 mya)

① movement of Indian plate towards the Eurasion plate
② Density of Indian plate higher and led to subduction
③ Furrowing of Tethyan sea floor in the procen due to crustal shortening

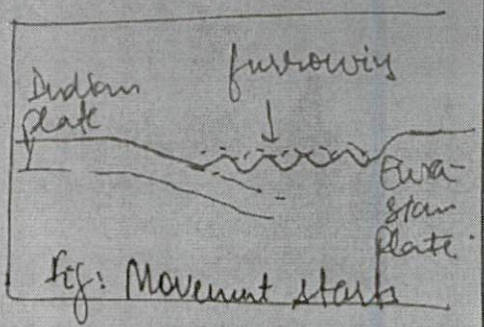


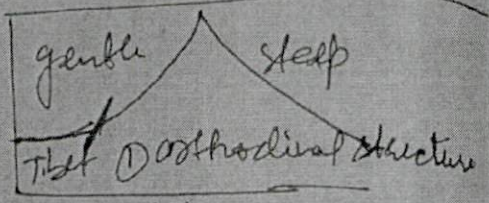
fig: Movement starts

II Collision of Indian plate at the Potwad ridge by 50-45 (million year ago).

Remarks

This lead to the formation of the Great Himalayas. Oldest in age and the inner most range.

Evidence supporting this collision can be found in the (1) orthoclinal structure of Great Himalayas due to unequal compression.



(2) Also nature of sediment in Great Himalaya = marine nummulitic.
Eg: Kashmir Himalayas and Shimla

(3) Also remnant volcanism can be found in Indus Valley and swampy fossils show plate migration

III Mid Himalayas during 30-25 mya

(1) Stronger collision with the existing Great Himalayas. leading to complex structures in folds.

(2) Evidences - (a) Recumbent, Nappe faults in the Mussorie hills

(b) Discrete ranges, Lake →

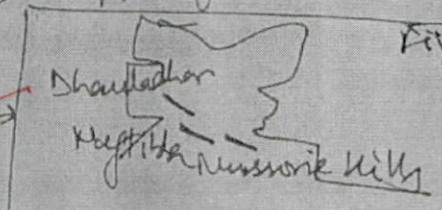


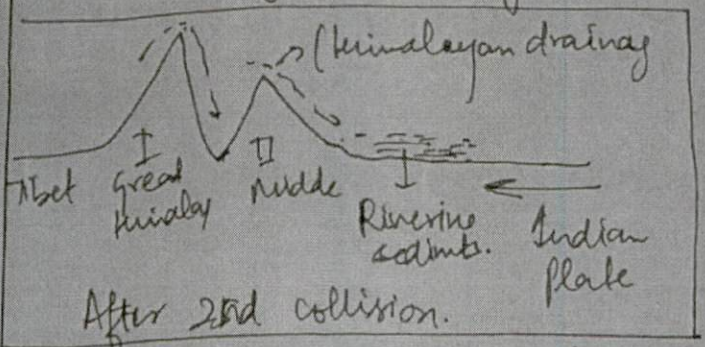
Fig: Discrete Ranges

(c) Sediments found are also of marine nature Eg: Kumaon sediments

(d) Hogback structure due to strong forces.

Remarks

IV Himalayan drainage and Shivaliks



① Next collision of Indian plate led to the formation of shivaliks.

② Lower height and also different nature of sediments – fluvial (compared to earlier marine)

③ Also, evidences of fluvial proces of erosion can be seen in the absence of Shivaliks near the westbengal 'dooars'

V Syntaxial bending in North East due to the formation of Arakan Yoma mountains

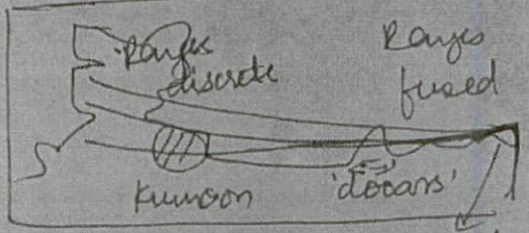


Fig: Himalayan structure. Syntaxial bends

Recent evidence of Himalayan upliftment can be seen in the earthquake vulnerability of area. Also images by cartosat show plate movement at 5cm/year.

This needs careful hazard vulnerability planning of the region as it lies in Zone V and

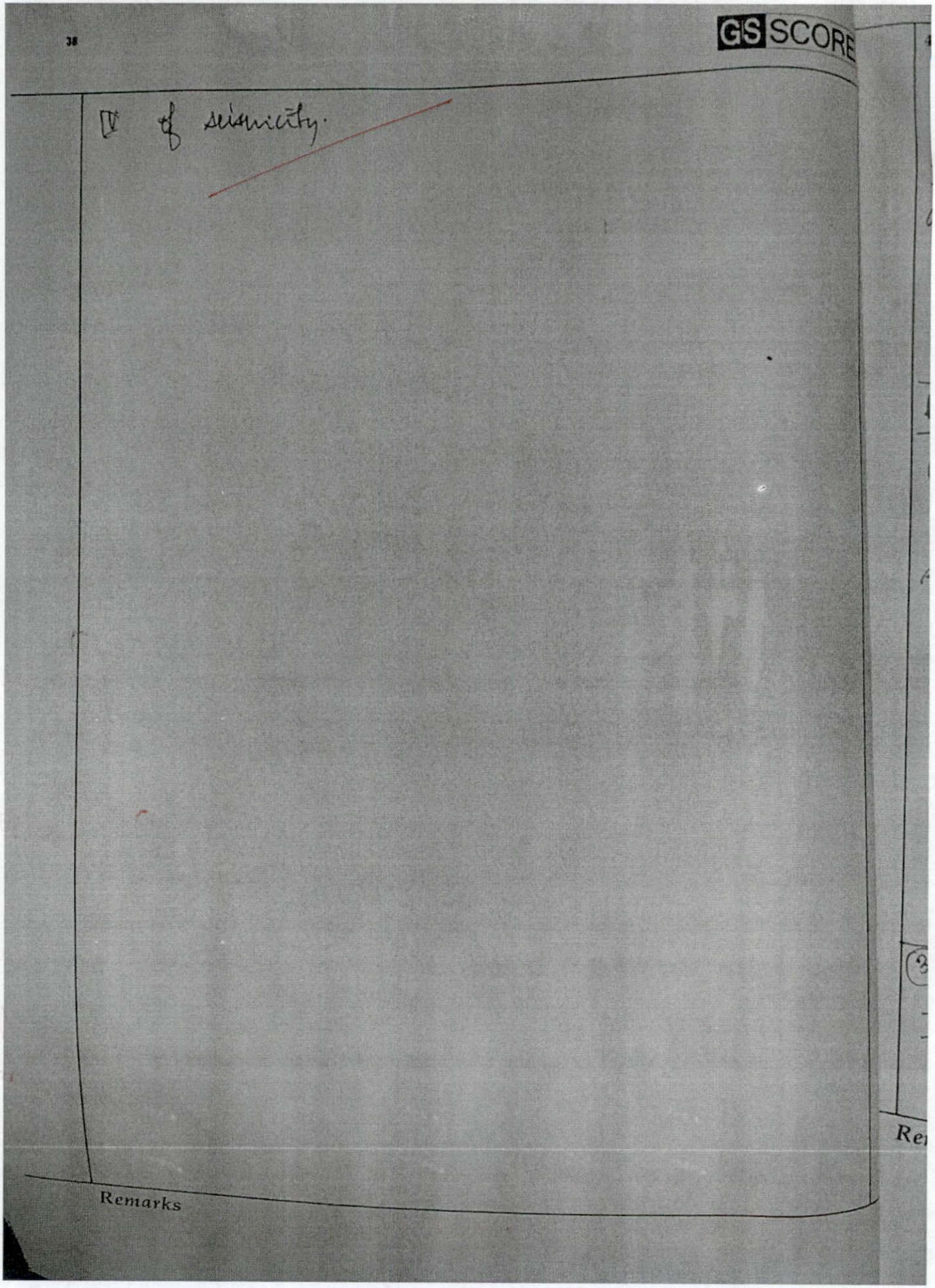
fair conclusion

good conclusion

12

Remarks

↑ You have written a fair answer with all dimensions being addressed, keep it up.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V of seismicity.
Remarks

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4. (b) Discuss the effects of relief and climate on the distribution of natural vegetation in India. (200 Words) (15)

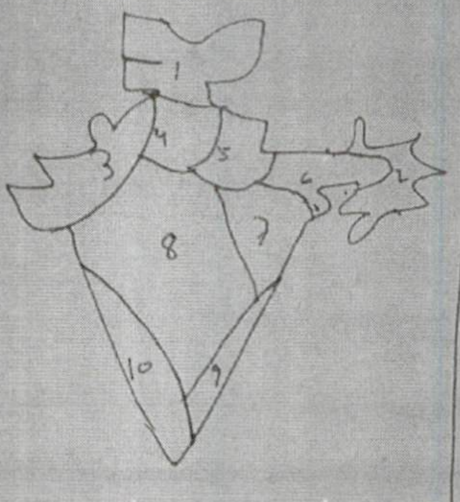
Although the largest vegetation type of India is tropical deciduous, yet there are huge variations due to climate and relief.

This is because 'vegetation is the best reflection of climate' (Koppen)

good usage of idea to interlink

Role of climate on distribution of Vegetation

① According to RL Singh's classification of Indian climate, vegetation distribution can also be seen related to rainfall and temperature.



① : Cool Himalayan Climate
- T~ 10-12°C Rainfall < 50 cm
- Vegetation : Tundra type - lichen, fire etc.
- Some areas of snowfall - Saffron

② Perhumid north east
- T - 25-27°C Rainfall > 250 cm
- Tropical evergreen trees like Redwood, Mahogany

③ Western desert type
- T = 27-29°C Rainfall < 50 cm
- Thorny Vegetation : Cactus, Babool etc

* Xerophytes prominently found here

⑩ Humid Sahyadri
- similar climate as of North East except rainfall 200-250 cm
- Trees: evergreen tropical.

Remarks

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(8) Semi arid tropical - interiors - Temperate = 26 - 27°c - Rainfall = 50 - 100cm - Tropical deciduous like Teak, Sal, Shisham	(9) Humid eastern part - areas of Jharkhand West Bengal. - Teak vegetation as rainfall 80-100 - Also Rice plantation

(4) Semi arid tropical - Punjab, Haryana etc - rainfall < 100cm - Deciduous trees like Khair, babool etc	(5) and (6) - Northern plains, Terai climate - swampy trees like Sal, sagon etc	(7) Tropical Littorals - Tamil Nadu - climate 100 cm rain. Trees like Red Sanders

(2) Shifts in vegetation due to climate

↳ Increased temperature and rainfall variability due to climate change, lead to shifting of vegetation

Eg: Northward shift of tree line in the Shivaliks (Eg: Fir line going upwards)

↳ Changes in succession due to forest fires

Eg: North East fires due to Jhum (2019)

Role of Relief

"Altitude mimics the latitude". Thus vegetation pattern can be seen as follows

Remarks

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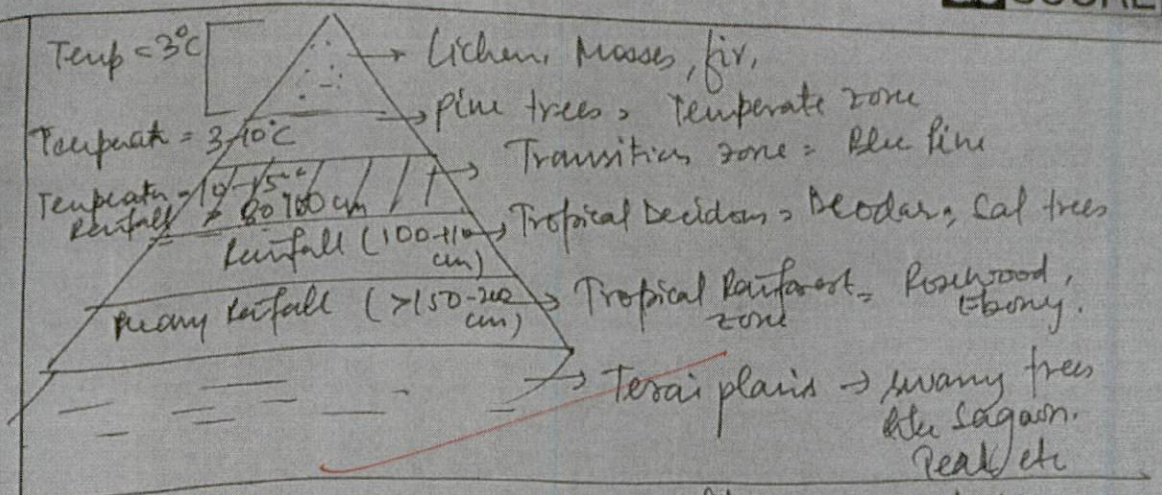


(7)

Thus with change in altitude, vegetation changes can also be seen.

Increasing risk of climate changes and events like droughts, forest fires etc have led to decline in vegetation cover since 1950s. According to FSI Report, 33% of forests of India prone to fires also.

* You have addressed the answer, but try to write how relief ie himalayas/mountains, coastal region, Plains, plateau regions have impacted in distribution of vegetation. Then explain how climate — temperature, altitude has influenced vegetation pattern across the subcontinent.

Remarks

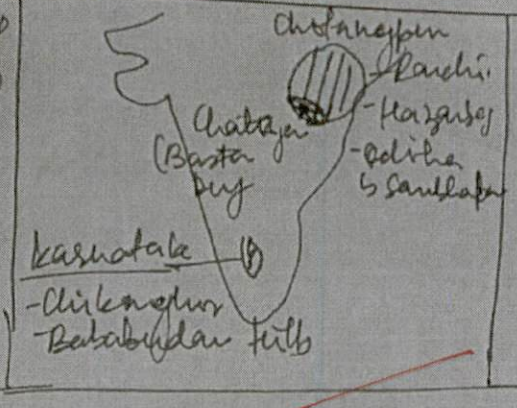
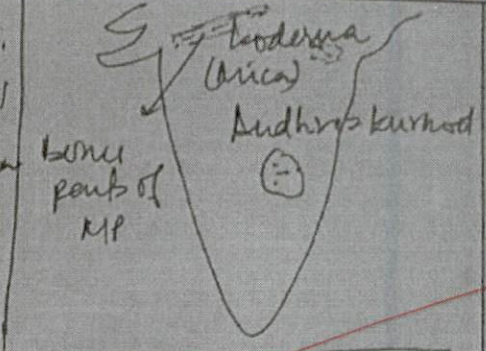
4. (c) Differentiate between Dharwad and Cuddapah rock system in India. Discuss their significance in the economic development of India. (200 Words) (15)

Dharwar and Cudappah rock systems are found in the peninsular plateau region according to SP Chatterjee. Yet they have differences due to the geological history of evolution.

6.5

	Dharwad	Cuddapah
Time formation	2.5 - 3 billion year ago	1400 - 1200 million year ago.
Formation	metamorphosed sedimentary rocks formed after the Archaen granites and gneiss.	sedimentary rocks due to filling up of geo-synclines by the sediments and thus compaction and lithification
Nature of rocks.	Crystalline, azoic rocks	Crystalline but softer than Dharwad rocks do not bear fossils.
Minerals present	Metalliferous minerals like Fe, Copper and also phyllites, mica hornblende	Non metallic minerals like sandstone, limestone, some traces of diamond
Remarks		

* some precious metals depositied ie gold, diamond in dharwad rock

location of Rocks		

Significance in economic development:

I | Dharwad Rocks

(1) the richest mineral belt of India - 98% of all metallic minerals are found.

(2) Basis of heavy industries during the end FYP of 1951–56.

Eg: Centres like: Bokaro, Jamshedpur, Bhillai Steel plants due to fe ore proximity

(3) Growth centres as the industrial towns leading to regional development (according to Perroux)

(4) Link to raw mineral export from India.

Eg: Bababudan hills - fe ore export via Kochi Port.

II - Cuddapah Rocks

(1) Mainly used in construction sector due to

Remarks * ROLE in ensuring energy security in India ie major coal deposits of the country.

nature of materials.
Eg: Marble quarrying in Andhra (Kurnool) and Jabalpur

(2) Traces of Mica used in construction and wood industry.

thus both cuddapah and Dharwar rocks have economic significance but in different sectors. Dharwar minerals form the bedrock of heavy industry, cuddapah rocks used in transitionary industries and construction

* mention some drawbacks / limitations of these rock systems in brief & factors inhibiting its exploration.

Remarks

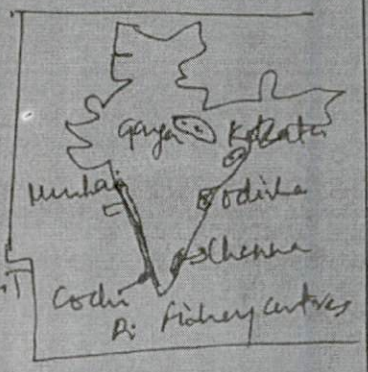
Section - B

5. (a) Write a short note on Blue revolution in India. Also write its prospect and challenges. (150 Words) (10)

Blue revolution, also called the fishery revolution began during 1980s. Since then, there has been a rapid growth in the fishery sector making India the 2nd largest producer of fishery (Economic Survey 2022)

Impact of Blue Revolution

(1) Improved yield and fish catch in both inland and coastal fishery.
[Inland = 8 mT and coastal = 3.5 mT]
produce



(2) Rise of aquaculture parks in the coastal areas.
Eg: Chennai and Kochi aquaculture zones.

(3) Improved export growth of fishery from India.
Eg: largest exporter of Shrimp (Survey 2021)
to USA and China.

(4) Development of exogenous growth for the coastal and farming community

positive impact
- Food security for the nation
- Nutritional security
- Economic security for small & marginal farmers & poor people

Remarks

- Young demography of the nation
- Add, rising Income level / disposable Income
- Rising consumerism

Prospects of Blue Revolution for India

1. Indian Ocean home to 15% of global fishing sector. Thus vast potential to expand
2. Increasing demand of aquaculture products in high value markets like USA, Canada, Russia
3. Can be a source of income diversification leading to Doubling Farmers Income (Dalwai Committee)

S.S

However certain challgs need to be addressed.

1. Environmental issues
   - loss of critical ecosystem of mangroves, Corals etc. due to bottom trawling
   - Migration patten changes of fish eg: Kerala Kollam fish catch decline by 75%. (Down to Earth Reports)
   - Brackish water intrusion leading to salination
2. Connectivity to post-processing infrastructure and reefer vans.
3. Involvement of industrial players affecting local community.

Phyto sanitary concerns of India's fish by E.U.

The renewed PM-Matsya Sampada can be linked to Sagarmala to make India hub of fisheries.

Remarks

5. (b) Write a short note on Zero Budget Natural Farming. (150 Words) (10)

Zero budget Natural farming refers to the use of localized and home grown inputs in agriculture to reduce the input costs and improved environment costs.

this was popularized by Subhas Palekar in Karnataka.

Components of ZBNF

④ Acchdana - live mulching and green manuring	① Beejmitra → pest resistant seeds - coated in cowurine & jaggery slurry
③ Waapsa - Soil air and water managment - by limited ploughing	② Jeevmitra - increase microbial action by vermi compost

Benefits of ZBNF

① Reduce the input costs of agriculture. Thereby increasing profit margin for farmers

② Can be easy practiced on small landholdings by small and marginal farmers (Agriculture census: 86% of farmer hold land size ~1 & 2 ha).

Remarks

(3) Reduces environmental emissions from agriculture. (The IPCC 'Climate change and land Report' says 25% of greenhouse emission from agriculture.

(4) Income diversification beyond traditional source.

Challenge of ZBNF

(1) Claims of increased productivity not yet verified. (Economic survey 2021)

(2) Issue of scalability across larger area of farms

(3) Limited extension to all crops needing intensive cultivation. Eg: Plantation, Rice etc

ZBNF should be deployed on a pilot basis to assess the the feasability and then included into the new agricultural revolution 2.0

* Concern raises in the backdrop of fall in productivity in States like Sikkim which had gone for organic cultivation & is now facing severe decrease in Output of crops hence a similar result of ZBNF can't be worked out.

Remarks

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5. (c) The growing pattern of ecological footprint is uneven in nature. Analyze with respect to land resources in India. (150 Words) (10)

Ecological footprint refers to the rate of utilization of ecological services vis-a-vis their capacity to regenerate. good definition

there are sharp inequalities in this pattern in India with respect to land resources.

good presentation

Unevenness in land use in India

① major portion of land use by agriculture. But low agriculture productivity (~1200-1300 kg/ha) compared to China, Russia (~2400-3500 kg/ha)

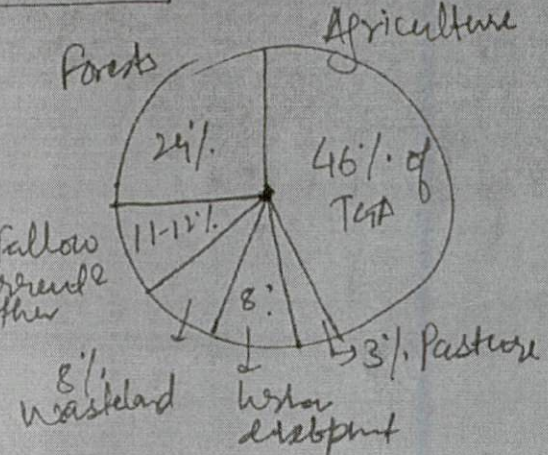


Fig: land use

② Also, the increasing population puts more pressure on land availability for agriculture

③ Built up area currently 8-9%. However, these are responsible for major green house gas emissions (~24% for transport, 21% from industry etc.)

ecological footprint uneven in nature because

a) different nations are different stage of development stages

b) different stage of demography transition etc..

Remarks

(4) Skewed land ownership and farm uneven footprint of development.

To overcome this unevenness in the footprint of land use Mohd. M. Shafiq recommend the land capability classification to be adopted.

4.5

(1) Assessment of the land potential for agriculture (soil, moisture, nutrients etc)

(2) Utilising the productive area for agriculture and non productive land for non-agro diversification

(3) creating equivalent carbon sinks

(4) Land Reform 2.0 based on goals of digitization and cooperative farming

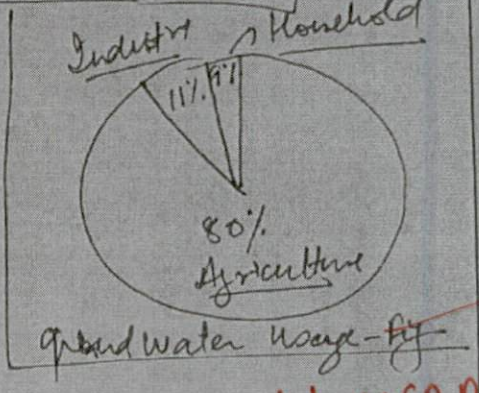
Land resources form the basis of dmlopmt. It is essential to have a balanced utilisation to fulfill the needs of locals and also environt sustainability.

Remarks

5. (d) What are the main causes of ground water depletion in India? (150 Words) (10)

According to Central Ground Water Bureau, 33% of ground water provinces in India face a risk of over extraction. This is the highest across the world.

Main Causes of ground water depletion in India are:



ground water usage - fig

(1) Agriculture

(a) Misaligned agriculture due to faulty crop choices.

Eg: Punjab - water level down by 90-100 cm/year due to Rice-wheat pattern

* Also add MSP policy of Indian rice & sugar cane.

(b) Heavily subsidized irrigation leading to overextraction

Eg: Marathwad - 80-90% rate of groundwater extraction

(c) Low efficiency of irrigation system and low rate of aquifer recharge

* Also mention provision of free electricity.

(2) Industry:

(a) Almost 80% of industrial groundwater extraction goes for coal industries

Remarks

* ground water deficit zones/regions in India could been shown using map of India.

(b) low rate of circular economy development

(3) Urbanization – currently 31% of urban areas in India leading to concretization of pavements and thus recharge capacity.

(4) only 8% of water is stored under Rainwater harvesting in India.

4.5

To overcome groundwater depletion

Agriculture	Industry	Domestic
(1) Micro irrigation – drip + sprinkler (2) Climate smart crop choices. Ex- Dry land farming	(1) Circular and zero liquid discharge system.	(1) Mandatory Rainwater harvesting structures.

A shift towards ~~too~~ Springshed based groundwater management is needed

* mention some case studies like KC valley project in Banglore which plans to recharge ground water using sewage treated water in Adjoining cities of chickballapur & Kolar district of Karnataka.

Remarks

GS SCORE

5. (e) Write a short note on West flowing rivers of our Country. (150 Words) (10)

The major west flowing ~~rivers~~ rivers of India are found in the peninsular plateau. These include- Narmada, Tapi, Sabarmati, Mahi, Periyar, Bharatpuzha etc.

Origin of West flowing Drainage

① Reactivation of the NSG (Narmada, Son-Godavari lineament during the tertiary times) leading to opening up of rift valleys of Narmada and Tapi

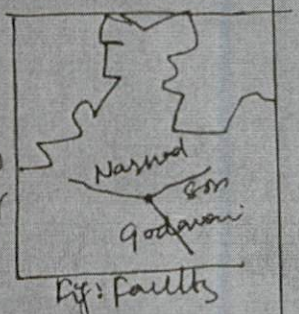
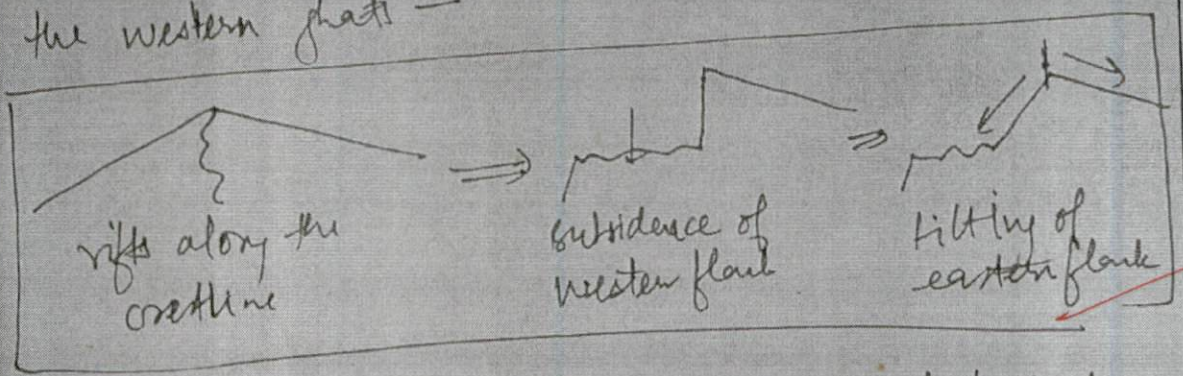


Fig: Faults

② Around 65-60 million years ago, tectonic clays in the western ghats —



Drainage features of west rivers compared to easter

West flowing	East flowing
① Short and swift	① long and sluggish

Remarks

* Also add some more rivers like
a) Kali, Netravathi, Sharavathi in Karnataka
b) Zuari & Mandovi in Goa

② Trellis and rectangular drainage	② Dendritic drainage
③ do not form deltas due to resistant archaen rocks	③ Deltas near the coast Eg: Cauvery
④ more estuaries formed thus better harbours	④ No estuaries, hence issue of silitation
⑤ generally superimposed rivers	⑤ Generally antecedent but some are also superimposed (Eg: Lubansiri a.

40/5

⑥ West flowing rivers have a great potential for hydropower generation - however they also pose a risk of landslide as they flow through steep gorges and ravines.

Remarks

GS SCORE

6. (a) "The fertile soils, perennial rivers and favorable climate, the great plains of north India are of immense economic and social significance". Elaborate. Also, discuss despite huge economic potential the entire Gangetic plain mainly in Uttar Pradesh and Bihar are marred by poverty.
(250 Words) (20)

The Northern Plains formed by the filling up of alluvial sediments in the 'foredeep' brought by perennial rivers offer great significance.

The troika of opportunity in Northern plains

Soil

① Fertile alluvium which is replenished annually - khadar soils.
* 80% of Northern plains)

Rivers

① Glacial originated rivers like Ganga river system.
Unlike the seasonal peninsular drainage

Climate

* Favourable climate
Average rainfall (100-150cm)
- Temperature -
Sum: 26-27°C
Winter = 12-15°C.

Economic significance of the troika

① Very high agriculture potential and also responsible for 60-70% of total food grain production

② Scope to set up agro processing clusters due to both proximity to raw material and market due to high population density.

Remarks

could show a map depicting either the plains, river system or soil profile ie khadar bhangar etc...

③ Uniformity of relief also offer opportunity for a comprehensive network of Road - Rail for establishment of industries.

④ Vast labour force available

⑤ Perennial rivers can form sources of inland navigation across states and also Multipurpose River Projects E.g: Hirakud Dam etc.

Social Significance

① Basis of urban settlements due to vast availability of lands. E.g: Cluster city in Varanasi, Noida ○ compact settlement, high density.

② generally lesser prone to climatic disasters unlike the coastal areas (cyclones) or Himalayan areas.

③ Growth region due to availability of labour (UP and Bihar ≥ youngest population as per NFHS survey 2020) ie young demography.

However, despite this potential, UP and Bihar have been marred by poverty. This can be seen in highest incidence of Multidimensional poverty in Bihar (34%), followed by UP (23%) and low levels of social development.

good data usage

Remarks

GS SCORE

	UP	Bihar	Ag. India
Literacy	~64%	~53%	77%
TFR	2.3%	2.7%	2.0

] = Poor social indicators (as per National Family Survey 2020)

} good usage of data.

Reasons

① Weak agriculture reforms - therefore presence of small and marginal farmers (~91% of farms are SMF in UP and Bihar compared to 86.6% nationally)

② The levels of cooperative movement have not been successful. (Eg: Gujarat, Tamil Nadu etc)

③ Limited industrial growth due to presence of land mafias in land allocation

④ Issue of connectivity to portlands and thus limits the export potential

⑤ Rapid out migration of youth (UP and Bihar = largest source of labours across India - Migration Report 2020), leading to collapse of village economies.

① Often true economic poverty, social poverty due to low access to healthcare (Eg: Encephalitis in UP and Bihar)

* mention reasons for lack of development being

Remarks high population to resources mismatch

* Low Investment of Human development Indicators like education, health & women empowerment

To bring in a change a multipronged focus is needed

Agriculture

1. digitize land records
2. food processing under SAMPADA and mega food park
3. Diversify towards horticulture (UP = maximum potential)

Industrial

1. Improving EODB by online portals and single window.

Service Sector

1. Centres of R&D to be established
2. Investment based on PPP model.

11.5

Northern Plains have to be next growth centre for India's vision of $5 tn economy by holistic focus on education, skilling, health and employment.

Remarks

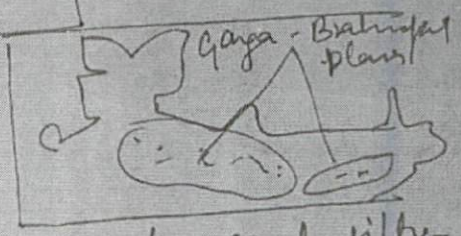
6. (b) What are the different Soil types of India? Briefly write the important characteristics and distribution of Major Soils. (200 Words) (15)

India has 4 major and 4 minor types of soil as classified by RP Singh. Each of these has a different economic characteristic.

Soils of India

Zonal	Intrazonal	Azonal
① Laterite soil	① Alluvial soil	① Black Soil
② Mountain soils	② Sandy Aeolic	② Red Soil
③ Peaty soil		③ Saline Soils
↳ formed due to climatic factors	↳ formed due to transportation and deposition	↳ formed due to insitu rock factors.

Major Soils and their distribution



① Alluvial Soils
- ↳ Occupy 40% of Area
- ↳ fertile riverine alluvium
- ↳ from West to east: change texture to sand-silty-clay and become darker
- ↳ Nutrient | Rich = Phosphorus, Potassium; Poor in Nitrogen
- ↳ Crops: Ria, wheat, Sugarcane.

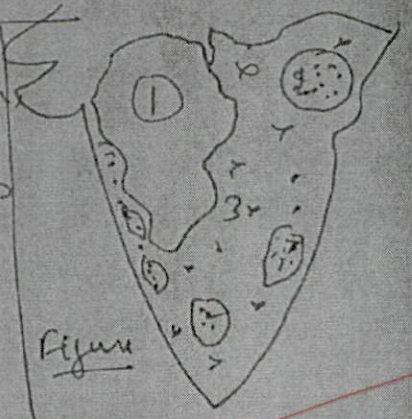
* Most of Alluvial soils deposition across India could have been depicted using map.

Remarks

② Soils of peninsular plateau

			Crops
Red	In situ granitic rocks disintegration	Rich in ferric oxide, red in colour	Cashews, other crops with irrigation
Black (Regur)	disintegration of basaltic rocks	- fe, lime, Mg. - clayey texture - Black colour	- cotton and sugarcane
Laterite	- leaching of SiO (silicon oxides), leaves fe and Al oxides (called sesquioxide)	- 'Paddy land' b hard surface - Rich in Bauxite, iron	- Plantation crops Like Rubber etc

Distribution of Red / Black / Laterite



Figure

① Black Soil
Maharashtra = Marathwada, Vidarbha
parts of Malwa, some parts of Karnataka, Telangana

② Red soil - entire plateau except Black and Laterite

③ Laterite Plateau highlands due to leaching = eg. Ranchi, Hazaribagh, Tumkur.

Along with these, minor soils like Peaty soils (found in Kerala - 'Kari' and Sundarbans), Mountain soils rich in humus, Colloric found in

growth of cotton

Remarks

western India and Saline Alkaline of Punjab, UP and Haryana are also found.

Soil determines the agricultural potential and forms the basis of development.

(7) → Also write some socio-economic importance of these soils in development of Agriculture

Remarks

6. (c) Give a geographical account of Coal resources of India in terms of its reserve & utilisation. (200 Words)

India has the 5th largest coal reserve in the world accordig to the economic survey 2021. However, it is the 2nd largest importer of coal.

6.5

Distribution of Coal reserves in India

(1) the chotanagpur plateau

(a) Formed 250-200 mya
(b) 95% of India's coal reserves.
(c) Mainly of the Bituminous type with 80-85% carbon

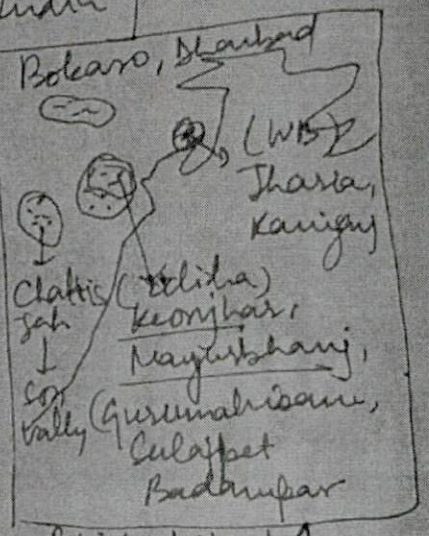


fig: Distribut 1

(2) the Karnataka Coal

(a) Mainly lignite coal | 3-4%
of India's deposit
(c) Tertiary Eneon (65-70 mya)

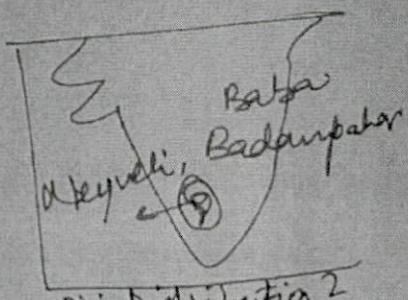


fig: Distribution 2

cross check this fact

(3) the Jammu Coal Reserves

(a) Anthracite coal (90-95% carbon)
(b) oldest tins (300-350 mya)

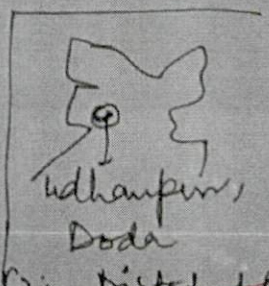


fig: Distribution 3

Remarks

* mention deposition in Singareni of Telangan, andhra pradesh region.

→ mention deposits of WB, Jhar khand region.

GS SCORE

However, despite the widespread distribution of coal, the utilization rate of coal differs across regions.

Utilisation

① Lowest utilization of the Jammu Coal due to rugged terrain and valley of Jammu by Jhelum cutting gorges.

② the Karnataka coal - Lignite - used to a limited extent in Bhadravati Steel Plant as low quality

③ Most Utilized Belt - the Chotanagpur Belt.

↳ Reasons ① higher quality of coal compared to other two

② Availability of mineral reserves of Fe ore in the Archaean rocks
Eg: Odisha - Mayurbhanj,
Bokaro - Fe and steel

③ Closer to ports like Dhanna, Kolkata, Vizag for export.

However, despite this India depends on import of coal. This is due to to -

(a) low quality compared to Ruhr, Rhine and

Remarks → mention how it helps in energy security & Industrialization with Major Industrial belt.

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Good Interlinkage

Appalachian coal (carboniferous time)

(b) Higher demand due to economic revival

(c) 100% import dependence on coking coal from Australia and USA as only 'Jharia' Deocha Panchami coal block has potential

There is a need to shift from coal as the dominant sector to other renewable resources. This is in line with India's commitment @ COP26 to have 50% renewable mix by 2030.

* Speak briefly on inefficiency of coal variety in India
* mention problems associated with coal mining in India

Remarks

8. (a) Examine the need of interlinking of Himalayan and peninsular rivers. Critically analyze the challenges of interlinking Himalayan and peninsular drainage systems. Discuss with reference to different river-interlinking projects. (250 Words) (20)

The interlinking of Himalayan and Peninsular rivers was first proposed by Sir Arthur Cotton post independence.

Later the idea was reiterated by KL Rao and then by Deenshaw Dastoor in his garland scheme. The proposal was to create a Northern garland of Himalayan rivers with a southern garland

Need for interlinking

① Nature of rivers regime

(a) Northern rivers are glacial fed and thus perennial but Southern rivers are seasonal

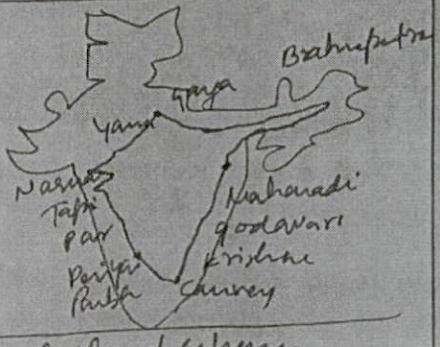


Fig: garland scheme.

② Rainfall distribution - Higher variability in monsoons especially below the 100 cm isohyet. Thus to maintain annual water supply to the peninsular rivers.

③ Floods and droughts

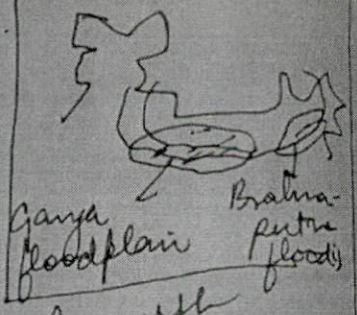
(a) Northern rivers - due to antecedant drainage

Remarks

* Also mention the need due to demographic change, urbanization & Industrialization.

GS SCORE

across alluvial soil prone to flooding hence diverting surplus water to the peninsular rivers which are more drought prone can help.



(4) Balance the agriculture potential of north and south as almost 60-70% of crop production from northern part due to better irrigation

Hence various interlinking projects have been initiated like the Ken-Betwa, Krishna-godavery interlink etc.

Challenges associated in the interlinking

(1) Climatic summoner

(a) Is the rainfall surplus and deficit concept has lot of subjectivity as surplus-deficit depends upon the levels of utilization and population
- Eg: population of North India more than South

(b) Mostly the floods and droughts are in sync.
Eg: floods in Brahmaputra coincide with floods in Mumbai

} good articulation of points.

Remarks

GS SCORE

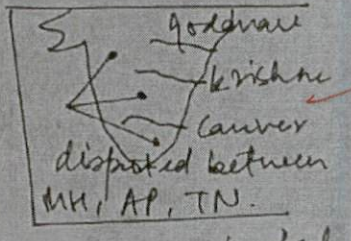
Eg: Drought due to monsoon failure in North also matches with drought in peninsulas.

(2) Topographic constraints.

(a) Cutting across the rugged peninsular blocks of archaen granitic and gneissic rocks.

(b) Issue of lifting water from the canals to the field application area

(3) Inter-state challenge in river water sharing



(4) Issue of deforestation and tribal displacement in the construction of link projects (Patkar committee report states that it can lead to 23.8% of tribal displacement)

(iii) Submergence of most of Tiger reserve in the project.

Therefore following can be done:

(1) Increase the present irrigation efficiency

Ultimate potential = 140 mha → Utilised 80-90 mha → Wasted 20-30 mha

Min. of Agri Data

(2) go for localised ~~agri~~ rainwater harvesting

Remarks

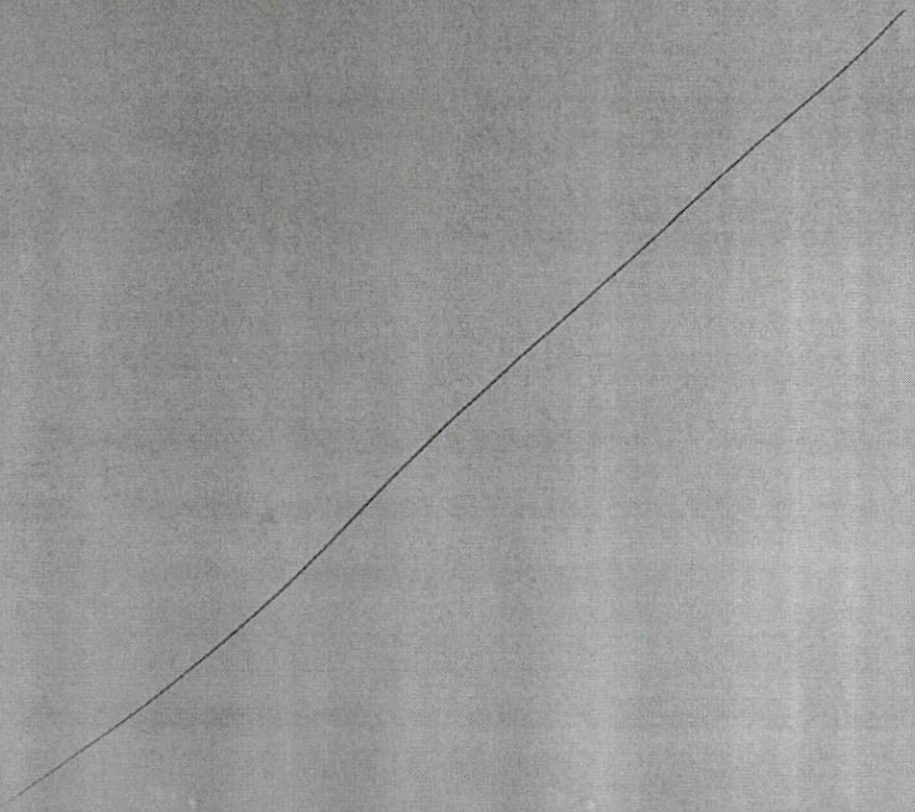
* Add the economic constraints in linking of rivers

structures. Eg: Bundelkhand 'Kuan-Talab' Tiyao Abhiyaan'

(3) Interlinking on a small scale can be tested on pilot based. Eg: localised links of Narmada-Papi etc

(en) Lift irrigation project in telangana

Interlinking of rivers merely will not solve water problems. Addressal of root cause of low efficiency in use needs to be addressed



Remarks

8. (b) Discuss the main causes and consequences of soil erosion occurring over extensive parts of our country. Suggest some viable measures to solve this menace.

(200 Words) (15)

According to ISRO's Land degradation Atlas almost 65% of India's soil is susceptible to soil erosion with varying intensities.

The causes however vary regionally and thus lead to diverse consequences.

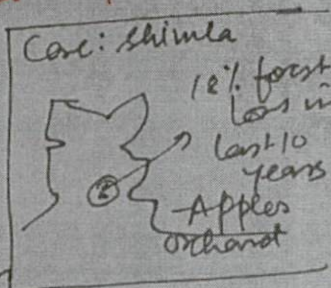
Regional causes and Consequences

1) Soil erosion in Hilly areas.

Causes

(1) Deforestation of the temperate montane forests for plantation orchards and tourism

Deforestation due to agriculture accounts for 80%.

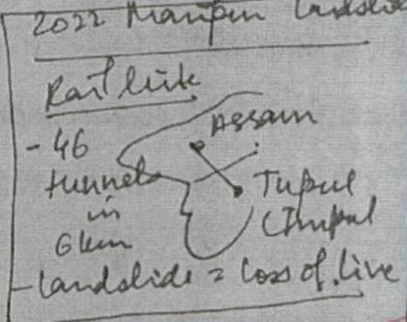


(2) Slope destabilisation for construction purposes. Ex: Clearance of forests in Arunachal for connectivity under NE - SARDP.

~~(3) Thumming~~

Consequences

(1) Increase in landslides in hilly areas



(2) Instances of cloud burst due to concrete exposed slopes forming urban heat islands

Remarks

② Soil erosion in Northern Plains

Causes	Consequences
① Intensive agriculture with heavy chemical inputs in Punjab, Haryana etc. leading to growth of 'chos' = (rills)	① Low groundwater table Eg: Punjab - 60 - 100 cm/year decline
② Urbanization and land clearance Eg: Greater Noida expansion	② Decline in forest regeneration capacity. Eg: Peak decline in UP - Gorakhpur
	③ Change in monsoonal regime due to change in evapotranspiration

③ Soil erosion in coastal areas

Causes	Consequences
① storm erosion due to cyclones Eg: Sundarban = 30% erosion due to annual cyclone (MoES Report	① decline in pristine habitats - Eg: Mangrove decline in Pichavaram (SoF Report 2021)
② soil fertility due to salinization (brackish water intrusion) Eg: Chennai	② Increase risk of coastal inundation as loss of bioshields

Remarks

* Add terrace farming

* Agroforestry & Social forestry.

GS SCORE

To overcome the issue

① ~~topic~~ Sustainable infrastructure development — use of bioswales, geotextiles and blue green infrastructure for construction

* minor water dams rather than large to check siltation

② Sustainable agricultural practices to minimise soil erosivity

Eg. Drip and sprinkler irrigation, dryland farming, terrace farming

③ Greenspaces via urban forestry, social forestry

Eg: Miyawaki in Pune / Bangalore

④ Construction of rain water harvesting structures to reduced the runoff flow by interception (Eg: Trenching practice)

805

⑤ Some structural measures can also help in short term like wire netting, Stone pitching.

Soil erosion control should be a key policy action in the development agenda of 21st century.

* Include more of Agronomic Solutions as way forward in your answer.

Remarks

8. (c) Discuss the rising problem of air pollution in Delhi NCR also write about the initiatives taken by central and state governments to curb the menace. (200 Words) (15)

The AQI (Air Quality Index) of Delhi every year falls to around 200-250 indicating severe level of air pollution.

Causes of Delhi air pollution

① Rapid urbanisation in and around Delhi leading to increased transport use.
According to CPCB = 24% of Delhi pollution due to vehicular traffic.

② Higher cooling demand from refrigerator, AC etc leading to increase of HFC emission

③ Development of industrial complexes
Eg: Bhushan steel plant, NOIDA industrial cluster * Also mention role of Klin (brick kilns)

④ Issue of stubble burning during the months of November-October around Delhi NCR.
In that time, it contributes to 17% of pollution.

Delhi pollution peaking in Winters

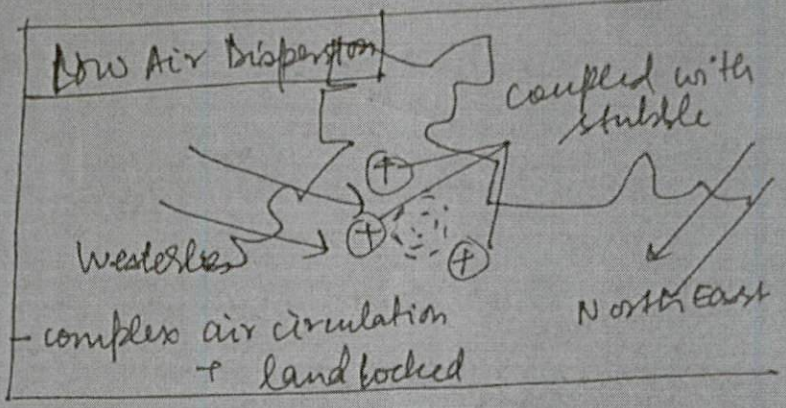
According the World Air Quality Report, the pollution level in Delhi especially peaks

Remarks

* Role of plying of diesel vehicles
* Thermal power plant in the vicinity
* Add temperature Inversion as reason

during the winters. this can be understood as.

- Also cooler climate, lead to surface inversion trapping the 'smog' close to ground.



Impact → on environment → Urban heat domes leading to frequent heat waves
→ reduce visibility leading to accidents
Eg: Yamuna Expressway accidents in winter

↓
On human health

① Increase of Non communicable disease in Delhi (70% deaths due to NCDs)

Steps taken by central and state Government

① Setting up of 'smog towers' and air purifiers to reduce pollutants

② Ban of stubble burning and supplemented by initiatives like Torrefaction (convert stubble to coal), machines like Happy Seeder etc)

→ mention some temporary measures under GRAP ie a) banning of diesel vehicles
b) shutting down of coal Industries or thermal power plants if certain parameters are breached etc..

Remarks

(3) Shift to e-Mobility and mass rapid transport systems. (Eg: Green Buses in Delhi = 1st in country)

(4) Setting up of CAQM (Commission on Air Quality management) replacing older EPCA (Environmental Pollution Control Authority) for inter-state coordination in pollution control.

7.5

Delhi pollution problem needs a holistic remedy. It need urban decongestion and also changes in mobility, agriculture and waste disposal.

Remarks