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GENERAL STUDIES (TEST CODE : 1693)

Name of Candidate	DIVYA MISHRA		
Medium Eng./Hindi	Eng.	Registration Number	38515
Center	Online	Date	27.10.20

INDEX TABLE		
Q. No.	Maximum Marks	Marks Obtained
1	10	
2	10	
3	10	
4	10	
5	10	
6	10	
7	10	
8	10	
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18	15	
19	15	
20	15	

Total Marks Obtained:

Remarks:

INSTRUCTIONS

1. Do furnish the appropriate details in the answer sheet (viz. Name, Registration Number and Test Code).
   उत्तर पुस्तिका में सूचनाएं भरना आवश्यक है (नाम, प्रश्न–पत्र कोड, विद्यार्थी क्रमांक आदि)।
2. There are **TWENTY** questions printed in **ENGLISH & HINDI**
   इसमें बीस प्रश्न हैं अंग्रेजी और हिन्दी में छपे हैं।
3. **All questions are compulsory.**
   सभी प्रश्न अनिवार्य हैं।
4. The number of marks carried by a question/part is indicated against it.
   प्रत्येक प्रश्न/भाग के अंक उसके सामने दिए गए हैं।
5. 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 medium other that the authorized one.
   प्रश्नों के उत्तर उसी माध्यम में लिखे जाने चाहिए जिसका उल्लेख आपके प्रवेश पत्र में किया गया है और उस माध्यम का स्पष्ट उल्लेख प्रश्न–सह–उत्तर (क्यूसीए) पुस्तिका के मुख्य पृष्ठ पर अंकित निर्दिष्ट स्थान पर किया जाना चाहिए। उल्लिखित माध्यम के अतिरिक्त अन्य किसी माध्यम में लिए गए उत्तर पर कोई अंक नहीं मिलेंगे।
6. Word limit in questions, if specified, should be adhered to.
   प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए।
7. Any page or portion of the page left blank in the Question-Cum-Answer Booklet must be clearly struck off.
   उत्तर पुस्तिका में खाली छोड़ा हुआ पृष्ठ या उसके अंश को स्पष्ट रूप से काटा जाना चाहिए।

EVALUATION INDICATORS

1. Contextual Competence
2. Content Competence
3. Language Competence
4. Introduction Competence
5. Structure - Presentation Competence
6. Conclusion Competence

Overall Macro Comments / feedback / suggestions on Answer Booklet:

1.

2.

3.

4.

5.

6.

All the Best

Don't write anything this margin (इस भाग में कुछ ना लिखें)

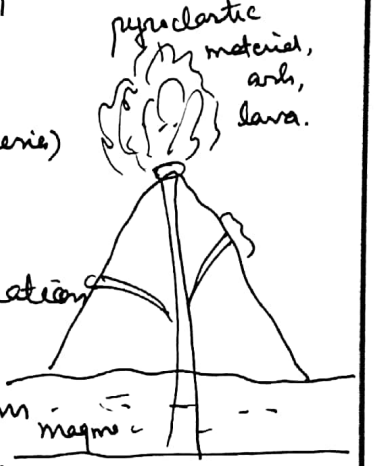
1. Explain the concept of volcanic winter giving examples. **(150 words) 10**
उदाहरण प्रस्तुत करते हुए वोल्कैनिक विंटर की अवधारणा की व्याख्या कीजिए।

Volcanic winter is the decline in temperature of a region due to lack of sunlight reaching ground on account of prevance of aeroral particles, dust, ash, and pyroclastic material thrown by volcanos

eg mount Aconcagua eruption.

eg Mt. Vesuvius (Italy)

eg Anak Krakatua (Indonesia)



- magmatic fine particles go to atmospheric circulation
  ↓
  relatively calmer conditions lead to their sustenance in upper layers
  ↓
  Blockage of insolation due to cloud formation on aerorals.
  ↓
  decrease in temperature
  ↓
  volcanic winter.

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2. Bring out the importance of community-based disaster management in India. (150 words) 10

भारत में समुदाय-आधारित आपदा प्रबंधन के महत्व को स्पष्ट कीजिए।

India lost $ 80 Billion due to disaster and 80% of the population in prone to varying kind of disaster

ex Earthquake, cyclone, floods, drought

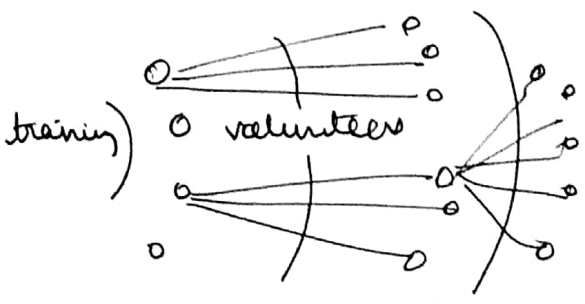
Community based disaster management

when community capability is built up to deal with disasters using local sources, conventional system and modern methods.

ex. Andaman and Nicobar tribes went to uphill areas during Tsunami (2004)

ex Contrary to Cyclone Phailin (1999), Odisha's community management in Cyclone Fani (2019) was praised by UN.

- It has a cascading effect approach



Importance

- Prime minister's 10 point disaster management approaches calls for - local community based solutions.
- Local people know best
  eg. during chennai floods (2015), locals guided army vehicles.
- Sendai framework (2015-30) and CDRI places community at the core of disaster management.
- Community is the first responder in any disaster

3. The concept of ecological footprint is a useful indicator for assessing progress on the sustainable use of resources in a country. Explain.

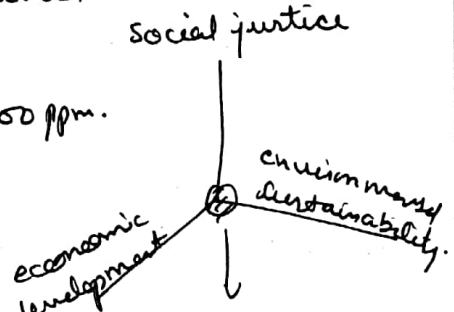
(150 words) 10

किसी देश में संसाधनों के संधारणीय उपयोग पर हो रही प्रगति का आकलन करने के लिए इकोलॉजिकल फुटप्रिंट की अवधारणा एक उपयोगी संकेतक है। व्याख्या कीजिए।

Recent ~~used~~ WEF spearheaded report highlighted that humanity has exceeded its ecological footprint by more than 1.5 times. It means we have exceeded earth's ability to regenerate its resources within a given time period.

Ecological footprint

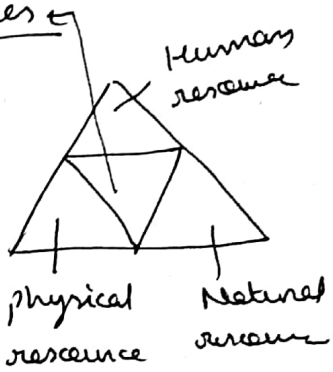
- Amount of GHG emitted
  eg. current CO_2 levels have exceeded 400 ppm.
- SO_2 and NOx levels
  eg. India - SOx hotspot
- Resource extraction and recycling
  eg. world will have more plastic than fishes by 2050
- Soil degradation
  eg 37% of India's soil is degraded.
- Deforestation, mining, groundwater extraction.



- New accounting tool of GDP which accounts for environmental costs gives a measure for ecological footprint.

Sustainable use of resources

- Planting trees, preventing land degradation
  eg. UNCCD's - land degradation neutrality (2030)



- Ocean hoperpots management
- Paris deal, Kyoto protocol and Vienna convention.
- Aichi targets - Biodiversity.
- UN decade on ecosystem restoration.
- UNFCCC - loss and damage, Talanoa dialogue, Warsaw convention
- Blue COP - 'Chile' as host for sustainable maritime activity.

Brundtland report (1987) provided for sustainable development. Earth doesn't belong to us. We belong to earth.

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4. The CRZ Notification, 2018 aims to maintain a balance between economic growth and conservation principles of coastal regions. Discuss.

(150 words) 10

CRZ अधिसूचना, 2018 का उद्देश्य आर्थिक संवृद्धि और तटीय क्षेत्रों के संरक्षण सिद्धांतों के मध्य संतुलन बनाए रखना है। चर्चा कीजिए।

CRZ notification 2018 have amended the previous notification and have made way for more inclusive development alongwith environmental protection.

eg. Supreme court ordered dismantlin Maradu apartments (Kochhi) due to violation of CRZ rules.

- The norms of CRZ-I and IV have been unaltered
- The exemption limit has been increas from 50 m to 200 m in dense urban areas for tourism related ancillary activities for - FEE beach certification

5. Fertilizers have been one of the key inputs in the agricultural sector since Green Revolution in India. In this context, give an account of distribution of fertilizer industry in India. **(150 words) 10**

भारत में हरित क्रांति के बाद से, उर्वरक कृषि क्षेत्रक का एक प्रमुख आदान (इनपुट) रहे हैं। इस संदर्भ में, भारत में उर्वरक उद्योग के वितरण का विवरण प्रस्तुत कीजिए।

Fertilizer were a key component of green revolution alongwith HYV seeds and perticides. India is self reliant in urea fertilizer manufacturing (though natural gas is imported) and in Phosphatic and Potassic fertilizer >50% of raw material is imported.

Fertilizer Industry

- Mostly in coastal areas

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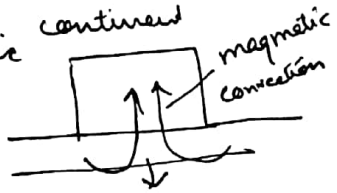
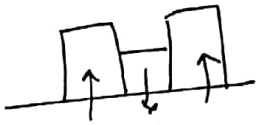
6. Giving example, explain how continental rupture ultimately results in the formation of a new ocean basin. **(150 words) 10**
उदाहरण देते हुए, स्पष्ट कीजिए कि किस प्रकार महाद्वीपीय विदारण के परिणामस्वरूप अंततः नवीन महासागरीय बेसिन का निर्माण होता है।

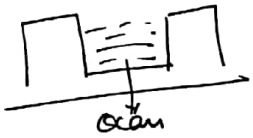
Alfred Wegner gave sea floor spreading theory. The blocks and faults formed make way for rift valleys and oceans.

- Due to upwelling magmatic activity, a part of the continent may sink below.



- The resulting geological formation will have block mountains and a rift valley





  eg. Rift valley (Africa)
  eg. Narmadi, Tapi rift valley.
- Which will be gradually inundated with catchment water.
  eg. Red Sea
- The rift valley under Tectonic forces will gradually widen giving way to new ocean basin.

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7. COVID-19 has exposed gaps in India's domestic laws to deal effectively with outbreaks of infectious diseases, especially pandemics. Discuss.

(150 words) 10

कोविड-19 ने संक्रामक रोगों, विशेष रूप से महामारियों के प्रकोप से प्रभावी ढंग से निपटने में भारत के घरेलू कानूनों में व्याप्त अंतरालों को उजागर किया है। विवेचना कीजिए।

India followed the legal postulates of colonial era Epidemics diseases Act, 1896 that British passed to deal with Bubonic plague in Bombay, alongwith IPC sections.

Exposed gaps

- Aforementioned law was meant to deal with situation of localised health emergencies like epidemics not pandemics.
- No priority chart for actionplan.
- Haphazard and arbitrary management under NDMA, 2005.
- No institutional arrangement in place
- Response centric approach rather than pro-active holistic approach.
- Followed world model of complete lockdown rather than customised solution.
- Health - State subject - a lot of variation across States.

- Health infrastructure - overwhelmed
- Focus on flattening the curve rather than preventing the outbreak
- Huge economic loss. (15-32%) of trade.
- Migrant crisis.
- Supply chain disruption.
- MSME, Agriculture, construction - worst affected

Measures needed.

- Legal framework to be in place
- community awareness and capacity building eg. Japan - lockdown was not long, economic activity continued.
- Epidemiological data mapping on a continuous basis is needed.
- Health expenditure (from 1.4% to 2.5% of GDP)
- current 1456 ~~doctor~~ patient per ~~doctor~~ doctor to WHO recommended 1000.

Pandemic management should become part of developmental planning

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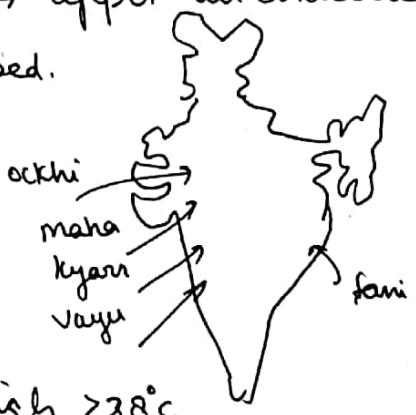
8. Give an account of the increasing frequency of cyclonic activity in the Arabian Sea region. (150 words) 10

अरब सागर क्षेत्र में चक्रवाती गतिविधि की बढ़ती आवृत्ति का विवरण प्रस्तुत कीजिए।

Usual ratio of cyclogenesis in Bay of Bengal to Arabian Sea is 4:1. However current year's cyclone trend shows a reversal.

Reasons

- Global warming → upper air circulation over Arabian disturbed.
- Very few sources of river water offtake
- Ocean sea surface temperature very high >28°C
- Tropical jet stream flows.
- Ocean currents during pre-monsoon making cyclogenesis easy.
- Less dispersion of air → perfect conditions for cyclone formation.



Impact

- delay in monsoon arrival.

- Western coastal infrastructure will see damage
- More public expenditure on disaster management
- Important industries on western coast of Crude oil, fertilizer, ports.
- Maritime economy will be affected.
- Number of effective fishing days will reduce.

Therefore with current climate change induced pattern reversals, disaster resilient infrastructure and shift to renewable energy has become a necessity.

9. Explain the phenomena of Sudden Stratospheric warming witnessed in recent years. How does it affect the ozone hole formation over Antarctica? **(150 words) 10**

हाल के वर्षों में देखी गई आकस्मिक समतापमंडलीय तापन की परिघटना की व्याख्या कीजिए। यह अंटार्कटिका के ऊपर ओजोन छिद्र के निर्माण को किस प्रकार प्रभावित करता है?

Ozone layer exists in the stratosphere (15km – 50km) above the troposphere. Till now the challenge has been antarctic ozone hole due to southern polar winters and CFCs but now new phenomenon of Stratospheric warming is observed.

- Global warming raises temperature
- Higher solar insolation in this cloudless zone of atmosphere.
- more UV rays → Higher temperature.

Impact on ozone hole

- It will prevent formation of polar stratospheric clouds (PSCs).
- PSC can only form in very cold temperature (−≤50°C)
- Chlorine free radical cannot break the O_2 molecule for O_3 formation.

- It will reduce ozone hole size.
- May thicken the layer.

Kigali Agreement (2016)

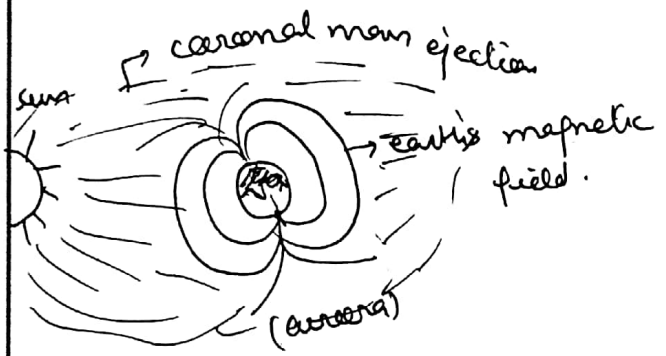
On recently protocol was made to preserve Ozone layer from depletion. However this natural process will also heal the ozone hole

Don't write anything this margin (इस भाग में कुछ ना लिखें)

10. Write a brief note on Earth's magnetism and its role in protecting the Earth from solar winds. **(150 words) 10**

पृथ्वी के चुंबकत्व तथा सौर पवनों से पृथ्वी की रक्षा में इसकी भूमिका पर संक्षिप्त टिप्पणी लिखिए।

Earth's liquid core with molten iron is responsible for its magnetic activity that shields it from solar winds. It forms a blanket around earth's atmosphere preventing harmful solar flare to reach ground.



- Solar winds contain harmful UV radiation which may cause - cancer and damage life.
- It also interfere the functioning of satellites in low earth orbit
- It can adversely affect the GPS, navigation activities.

Aditya L1 mission of ISRO, Solar Parker mission ~~of~~ and SOHO are various international projects to understand this phenomenon and develop further safeguards.

11. How does climate change affect the process of desertification?

(250 words) 15

जलवायु परिवर्तन मरुस्थलीकरण की प्रक्रिया को किस प्रकार प्रभावित करता है?

Recent IPCC report highlights the global average temperature has already risen above 1.5°C above preindustrial level which may further lead to desertification.

Desertification - degradation of land in dry, humid and subhumid areas.

Effect of climate change

- Global warming
- extremity of weather - floods and droughts simultaneously
- soil erosion
- loss of soil fertility
- flood / sea level rise → frequent inundation → Salinization of soil
- loss of peatlands (drying of wetlands) → fires in dry season → soil disaggregate
  Eg. Brazilian wetland.
- Acid rains → soil acidity.
- soil moisture loss → due to evapotranspiration.

Measures

- Afforestation
- Agro-climatic equilibrium through climate resilient crop
- drought-proof / resistant cropping
  eg. coarse cereals, hardy crops, millets etc.
- micro-irrigation eg. Israel.
- Agro-forestry eg. Kilimanjaro agroforestry model
- Social forestry.
- Soil health card.
- Intercropping and crop rotation.
- United Nations Convention to combat desertification (UNCCD)
  - Delhi declaration - engaging youth, farmers, scientists.
  - ecosystem restoration
  - judicious use of fertilizer.

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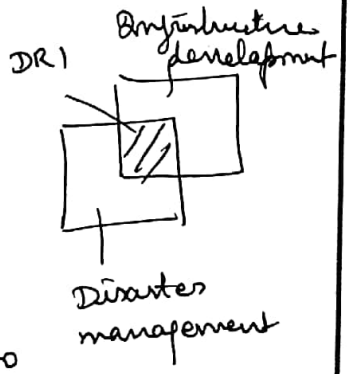
12. Discuss the increasing need of 'disaster resilient infrastructure' in India. Mention the steps taken in this direction with specific reference to the Global Coalition for Disaster-Resilient Infrastructure. **(250 words) 15**

भारत में 'आपदा-प्रत्यास्थ अवसंरचना' की बढ़ती आवश्यकता पर चर्चा कीजिए। ग्लोबल कोएलिशन फॉर डिजास्टर-रेजिलिएंट इन्फ्रास्ट्रक्चर के विशेष संदर्भ में इस दिशा में उठाए गए कदमों का उल्लेख कीजिए।

India has lost 2% of GDP ~$80 Bn over 2 decades due to disasters.
1 in every 7 person in prone to disaster.
Whereas, India needs to invest $1 Trillion in infrastructure in coming years.

Need for disaster resilient infrastructure (DRI)

- Finance diverted for disaster mitigation and relief can be diverted for DRI to achieve both.



- Reduces vulnerability to cyclones, floods and earthquakes.
- Ensures sustainability
  - Build back better principle
- "every $1 spent in DRI brings $7 in return"
- nature - capital expenditure.

- Greater employment.

Steps taken

- Coalition for disaster resilient infrastructure (CDRI)
  - Recently PM in UN Climate action summit, USA (2019) announced it with UK as co-chair.
  - Sets targets and goals for countries related to DRIs and frames strategies.
  - Works at the interface of Paris deal, SDGs and Sendai framework (2015-30)
  - HQ - Delhi
  - Advices and guidelines are voluntary and non-binding
  - Governing Council
    - apex decision making body, consist of all the members.
  - Fiji, Australia, Germany, Japan etc all are member.
  - India has already pledged $680 crore in the CDRI.

- Other steps

Structural measures	non-structural measures
◦ Sea walls. ◦ river embankment ◦ retrofitting of the vulnerable buildings	◦ capacity building of communities ◦ training ◦ mock drills ◦ disaster exercises

e.g. Recently, Odisha government followed policy of Zero casualty during Cyclone Fani with IMD data.

- National disaster management Plan-2019 provides for guidelines and disaster mitigation funds.

50% of our population is prone one or other disaster hence DRI is the sustainable way forward.

"By failing to prepare, we may prepare to fail."

Don't write anything this margin (इस भाग में कुछ ना लिखें)

13. Identify the important mineral belts of India. Highlighting some of the issues plaguing the mining sector in India, discuss how the National Mineral Policy 2019 aims to address these issues. **(250 words) 15**

भारत की महत्वपूर्ण खनिज पट्टियों की पहचान कीजिए। भारत में खनन क्षेत्रक को समस्याग्रस्त करने वाले कुछ मुद्दों को रेखांकित करते हुए, चर्चा कीजिए कि राष्ट्रीय खनिज नीति-2019 इन मुद्दों को किस प्रकार संबोधित करने का लक्ष्य रखती है।

India is a mineral rich country with world's second largest coal reserves, largest exporter of steel and producer of bauxite and abundance of thorium in the monazite sands.

Important mineral belts

- Chhota nagpur plateau - iron and coal reserves
- Coal - mayurbhanj, Raniganj in west Bengal
  - Neyveli, Salem
- Copper - Khetri (Rajasthan)
- Bauxite - Odisha, Jharkhand MP
- Uranium - Brahmaputra valley, Godavary valley
- Iron - Bailadila (Chhattisgarh), Odisha, west Bengal
- Mica - Rajasthan, MP, Odisha
- Thorium - Andhrapradesh, Kerala, Tamilnadu.

- coal & iron
- copper
- crude oil
- bauxite

Issues

- Major miners under union list and minor minerals - State list (schedule 7)
- Mines and minerals (development and regulation) Act - doesn't clearly define minerals. clarifications.
- riverbed mining, coastal mining leading to landscape disfiguration
- Illegal mining
- Undercriminate, unmonitored mines management
  eg. rathole mining (Meghalaya)
- very low private sector involvement
- Auditing of mines is lacking.
- Low FDI
- Nexus between contractors, bureaucracy and politicians.
- Unscientific mining → desertification
- land acquisition in tribal areas.
- forest and wildlife clearances are delayed eg. Vedanta - Niyamgiri hill tribe case

National mineral policy - 2019

- Clear delineation of minerals into major and minor.
- more private sector involvement is facilitated.
- e-auction / reverse auction of mining rights.
- prospecting cum mining rights.
- No captive use compulsion.
- mining as industrial infrastructure sector status - for ease of credit.
- District mineral fund - more rights to gramsabha for its management.
- Land acquisition and compensation guidelines
- Sustainable mining.

mining per se is not a problem. it is unsustainable mining that plays the devil. Economically viable, socially empowering and environmentally sustainable mining is the need of the hour.

14. Not only is the spatial and temporal distribution of freshwater in India very skewed, but also its usage inefficient and wasteful. Discuss in context of the current water crisis. **(250 words) 15**

भारत में ताजे जल का स्थानिक और सामयिक वितरण न केवल अत्यधिक विषम है, अपितु इसका उपयोग भी अकुशल एवं अपव्ययी है। वर्तमान जल संकट के संदर्भ में चर्चा कीजिए।

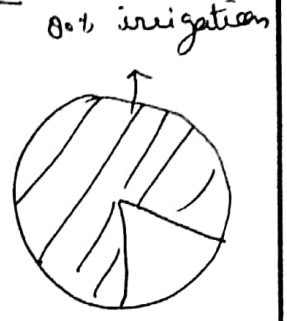
India receives 80% of its annual rainfall in just 4 months over June - September through south-west monsoon. While Assam and Bihar face flooding vidarbha and marathwada face drought simultaneously.

Skewed spatial distribution

- Ganges and Brahmaputra valley often face floods.
- Punjab and Haryana - have groundwater depletion.
- Rajasthan, Gujarat (Saurashtra, Kathiawad), Maharashtra - vidarbha - every year drought.
- Tamilnadu - low rainfall
- urban floods and heatwaves → transpiration low
- low groundwater recharge

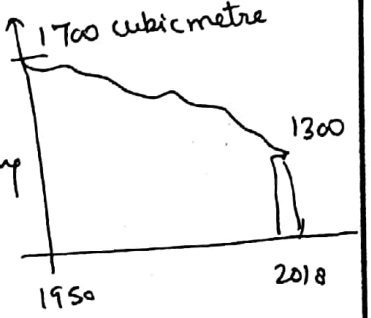
Skewed temporal distribution

- High rainfall within less time.
- Rain shadow regions - Aravali eastern side of western ghats no rainfall.
- North east rainfall on eastern coast during retreating monsoon.



2. Inefficient and wasteful usage

- Very less water use efficiency - on farm
- poor rainwater harvesting
- No river - interlinking
- High dependence on the groundwater extraction - Highest in the world.



(water stress)

- Electricity and water subsidies → water crisis.
- Excessive extraction → Uranium and arsenic pollution

Measures

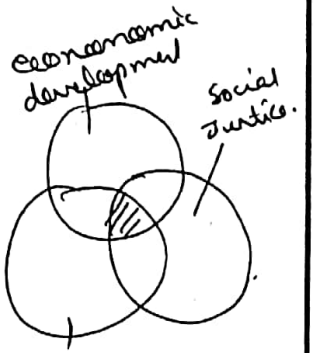
- River interlinking projects
  - eg Ken-Betwa
- Traditional rainwater harvesting measures
  - eg Ahar-Pynes (Bihar), Eri (Tamilnadu) Jhalara (Rajasthan)
- Jal Shakti Abhiyan
  - Source augmentation
  - grey water reuse
- Acquifer mapping - Bhujal Yojna
- Watershed development
  - Neeranchal project, PM Krishi sinchai Yojna
- micro, drip, sprinkler irrigation
  - per drop more crop.

Government from this year has initiated a Jan andolan for water harvesting to ensure harghar jal by 2024.

15. Examine how resource efficiency can bring about multiple benefits along the three dimensions of sustainable development - economic, social and environmental - in India. **(250 words) 15**

परीक्षण कीजिए कि संसाधन दक्षता, भारत में संधारणीय विकास के तीन आयामों-आर्थिक, सामाजिक और पर्यावरणीय - के साथ-साथ किस प्रकार विविध लाभ प्रदान कर सकती है।

India is a resource rich country - both natural - physical and human but without sustainable management it become a resource curse



Resource efficiency (RE)

- It is the ability to utilize resources with minimum wastage.

$$RE = \frac{\text{output}}{\text{input}}$$

Economic development

- More economic returns per unit resource
  eg. micro irrigation increase the water use efficiency by 30-80%.
- Reuse, Reduce, Recycle model creates recycling industry → more jobs.
- More economic output in sectors
  eg. automobile, cellphone etc.

- Less expenditure of Inputs.
  eg. extracting metal from mobile waste is cheaper than mining them
- Leads to balanced economic growth
  eg. Purnodaya mission (Steel Sector in Jharkhand and Odisha)

Social development

- Inclusive development
  - minimises external costs on marginal communities.
- Intergenerational equity is achieved.
- Health and education is prioritised,
  eg. DMF in tribal areas
- Realizes Amartya Sen's - Development is freedom - Capability approach.

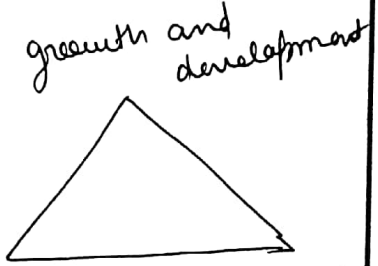
Environment sustainability

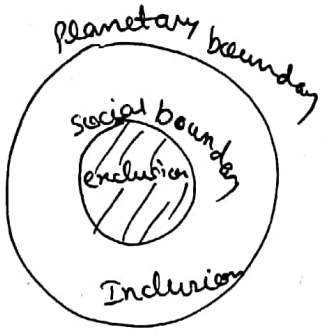
- decreases resource interventions
- less environmental pollution.
  - Solid waste management rules
- Recirculization of products into next stage

- Lower environmental footprints.
- maintain planetary boundaries.
  - eg plastic waste management rules, 2016.

Measures

- National action plan on climate change
- NITI Aayog - Resource efficiency framework
- Sustainable agriculture mission.
- Thrust on renewable sector - 87 GW action
  - & Biofuel policy
- Aspirational district programme.
- International solar alliance





(Doughnought economy)

Prakrati Rakshati Rakshitah - Nature protected protects you. RE is a step in that direction.

16. Highlighting the significance of unconventional hydrocarbons for India, discuss the issues faced in their exploration and extraction. **(250 words) 15**
भारत के लिए अपरंपरागत हाइड्रोकार्बनों के महत्व पर प्रकाश डालते हुए, उनके अन्वेषण एवं निष्कर्षण में आने वाली समस्याओं की विवेचना कीजिए।

India imports 80% of its energy needs in unconventional hydrocarbons making our energy security a matter of foreign policy.

Significance

- NITI Aayog - India's energy needs are going to increase by 20-30% by 2050.
- Renewable sector is still underdeveloped ~ 87 GW
- Coal still provides majority of thermal power.
- Natural gas is imported for the fertilizers, commercial and residential usage.
- Crude oil - Industries and transportation
- Petcoke and furnace oil - cheap but polluting sources.

UH - unconventional hydrocarbon

Issues in Exploration

- Lack of GIS maps related data.
- regulatory hindrances
  - Despite new policy, the unified exploration of coal and coalgas was denied.
- Government monopoly over mineral blocks
- clearances - environmental, wildlife and land acquisition is a hurdle.
- Auctions - reserve prices are high.
- Red tapism and bureaucratic hurdles

Issues in extraction

- poor technological infrastructure
- protests and public outrages.
- logistics - 14% of overall GDP
  - High cost of transportation from hinterland to ports.
- Captive usage compulsion.
- Regulation on labour laws.

Measures

- New Hydrocarbon exploration policy
  - unified exploration allowed.
  - unconventional hydrocarbons can be explored berides conventional ones
  - coal bed methane, shale gas - allowed
  - open acreage is given.
- Recent amendment in mines and mineral Act - provides for ~~mining~~ more flexibility for private sector participation.

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17. What is Soil Organic Carbon (SOC)? Identify various factors affecting SOC levels. Also, highlight the beneficial impacts of SOC on soil health and functionality. **(250 words) 15**

मृदा जैविक कार्बन (SOC) क्या है? SOC के स्तर को प्रभावित करने वाले विभिन्न कारकों की पहचान कीजिए। साथ ही, मृदा स्वास्थ्य और कार्यात्मकता पर SOC के लाभकारी प्रभावों पर प्रकाश डालिए।

Soil organic carbon is the amount of carbon (mobile and immobile) present in soil in the form of humus, litter, biomass, insects etc.

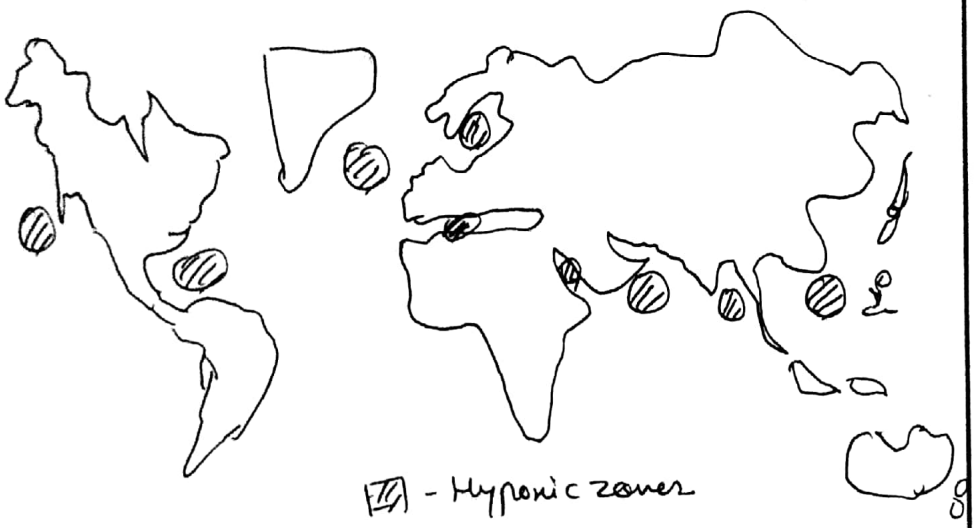
Factors affecting

18. Ocean deoxygenation is one of the most detrimental, yet under-reported side-effects of human-induced climate change. Identify the causes behind it. Also, mention its socio-economic and environmental implications for the world. **(250 words) 15**

महासागरीय डीऑक्सीजनेशन मानव प्रेरित जलवायु परिवर्तन के सर्वाधिक हानिकारक, तथापि अल्पसूचित दुष्प्रभावों में से एक है। इसके लिए उत्तरदायी कारणों की पहचान कीजिए। साथ ही, विश्व के लिए इसके सामाजिक-आर्थिक और पर्यावरणीय निहितार्थों का भी उल्लेख कीजिए।

Ocean deoxygenation is the loss of oxygen from the ocean water leading to fundamental changes in its biodiversity and composition.

certain identified zones



- Hypoxic zones

Recent IPCC report has highlighted the extent and significance of oxygen de-oxygenation in the world oceans.

Causes

- Global warming → ocean heat waves
  loss of O_2 ←
- High nutrient runoff → eutrophication
  loss of O_2 ← algal growth ←
- Nuclear and thermal power plant discharge in water.
- Ocean thermal energy converter.
- Ocean water deralization plants.

Socioeconomic implications

- Poor fisherman → less fish catch
- less crustaceans and molluscs
- more sea level rise
  ↳ because warm water level expands.
- coastal communities - livelihood insecurity.
- coastal tourism will be affected.
- economic output will decrease.
  - Blue economy will suffer
- New species may thrive.

Environmental Implications

- Oxygen saturation layers will shift and population of species that thrive on low oxygen may increase.
- More ocean acidification
- coral bleaching.
- cyclical growth - more EL NINO events.
- ocean-atmospheric events will be affected - madden-Julian, monsoon

measures

- Sustainable Blue economy
- limiting GHG emission
  - Paris deal implementation
- Renewable sources of energy
  - biofuel, wind, Seolar (ISA)
- Organic farming, less fertilizer usage.

67% of earth's area is under water. Ocean's health is our health. "We cannot look away because there is no away."

Don't write anything this margin (इस भाग में कुछ ना लिखें)

19. Approach to flood control in India should evolve from piecemeal measures to an integrated basin management. Comment. (250 words) 15
भारत में बाढ़ नियंत्रण के लिए खंडित रूप में उपाय करने वाला दृष्टिकोण क्रमिक रूप से एकीकृत बेसिन प्रबंधन के रूप में विकसित होना चाहिए। टिप्पणी कीजिए।

India's 40 million hectare area i.e. 12% of landmass is floodprone which has one of the densest populations in the world i.e. 800 million people

eg. Hyderabad floods (2020)
eg Chennai floods (2015)
eg Kerala floods (2018)

Current: piecemeal measures

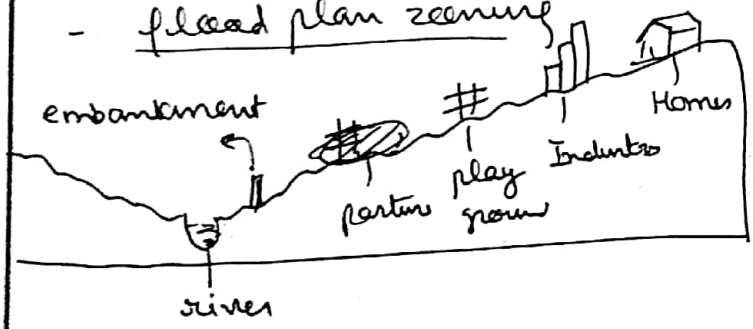
- Relief centric approach.
- No mitigation funds.
- localised monitoring of rainfall.
- Inter-agency coordination problems. eg. Kashmir floods (2014)
- No disaster resilient infrastructural investment
- Riverine floods (routine tragedy) eg. Assam and Bihar.
- Different States have different strategies.

III - floodprone area

NDMA released guidelines for integrated basin management

- Structural measures
  - water proofing
  - retrofitting, stilt-based homes.
  - flood relief centres.
  - flood plain zoning

(Stilt)



- Non-structural measures

  capacity building, training, mock-drills, skills etc

Integrated basin management

- River basin as a unit for planning the disaster management.
- Interstate and inter-agency coordination
- Inter-river linking
  - → transfer flood water to deficit region eg. Ken-betwa linkage

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- Hydrological data availability
- IMD - weather forecast along with real time flood level data.
  eg. CFLOWS in Chennai, Mumbai.
- Citizen participation for feedback and planning.
- Urban - drainage and upstream dam water release collaborations.
- Traditional measures and wisdom integrated with modern methods

eg. Netherland - Room of the river project in Kuttanad Kerala.

(Integrated basin management)

Floods are not new but a routine in Indian subcontinent. Their management should become a norm rather than exception.

20. Programmes for cleaning polluted rivers in India have been implemented for a long time, however, the results of these programmes are not very encouraging. Identify the reasons for the same and possible steps to rectify the situation. **(250 words) 15**

भारत में प्रदूषित नदियों की सफाई के कार्यक्रम लंबे समय से कार्यान्वित किए जाते रहे हैं, हालाँकि, इन कार्यक्रमों के परिणाम बहुत उत्साहजनक नहीं हैं। इसके कारणों और इस स्थिति में सुधार लाने के संभावित उपायों की पहचान कीजिए।

Namami Ganga programme was launched as an extention 1987 Scheme in 2014 with outlay of Rs 20,000 crore. Yet, even today in many areas the BOD levels remain high.

Reasons for poorer results

- Imbalance between developmental needs and environmental protection.
- Lack of Industrial effluent treatment monitoring.
- Obsolete technology with industries
  e.g. Agra tanneries
  ↳ chromium pollution.
- Lack of adequate funds due to small size of industries
  e.g. Kanpur leather cluster.

- polluted river stretches

- Lack of sewage treatment plants
- Mixing warm industrial water into river.
- lack of local community awareness and auditing of the same
- Underutilised funds.
- Interministerial and interdepartmental coordination
  - eg ministry of water resources, Health, Sanitation etc
- Thrust for industrial development

Possible steps

- Sustainable management
  - M.C. Mehta Vs. Union of India case SC highlighted the same.
- Penalisation for not following the Water pollution (Prevention) Act, 1974
- Sewage treatment plants - cluster based for small firms.
- Credit linked subsidies to firms for effluent treatment plants
- Social audit by communities

- Eco task forces for monitoring
- Roping in local volunteers and school children.
- Technological upgradation through capital subsidy on procurement.

Ganga bachao andolan Ganga Quest are noteworthy step. Rivers are not only divine in India but are our economic lifelines.

'Safe rivers, safe cities, safe community'