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GENERAL STUDIES (TEST CODE : 1701)

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Medium Eng./Hindi	ENGLISH	Registration Number	628078
Center	O.R.N	Date	20-Nov

INDEX TABLE

Q. No.	Maximum Marks	Marks Obtained
1	10	
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17	15	
18	15	
19	15	
20	15	

Total Marks Obtained:

Remarks:

INSTRUCTIONS

- 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)।
- There are TWENTY questions printed in ENGLISH & HINDI
इसमें बीस प्रश्न हैं अंग्रेजी और हिन्दी में छपे हैं।
- All questions are compulsory.
सभी प्रश्न अनिवार्य हैं।
- The number of marks carried by a question/part is indicated against it.
प्रत्येक प्रश्न/भाग के अंक उसके सामने दिए गए हैं।
- 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 than the authorized one.
प्रश्नों के उत्तर उक्त 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।
- Word limit in questions, if specified, should be adhered to.
प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए।
- 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।

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Delhi-110009

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

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

Volcano is the process of
reaching of magma to earth surface

volcanic
expulsion → Gases
→ Ash and dust
→ Pyroclastic.

→ Volcano eruption

↓
Gaseous expulsion
including Sulphur

↓
Release of Sulphur
into atmosphere

↓
Sulphur blocks the incoming
short wave solar radiation

↓
Reduction of insolation

↓
Cooling of local environment

↓
More volcanic winter
associated with rain fall

→ (eg) It is believed that Krakatoa eruption caused long term cooling effect on South. east Asia climate.

→ It also intensified the winter season of Indian subcontinent.

→ (eg) This phenomenon is very predominant in Mediterranean region.

→ Presence of active volcanoes such as Mount Etna, Stromboli etc.

→ This also ~~increases~~ decrease the winter temperature and help in snowfall and ~~less~~ snowflake.

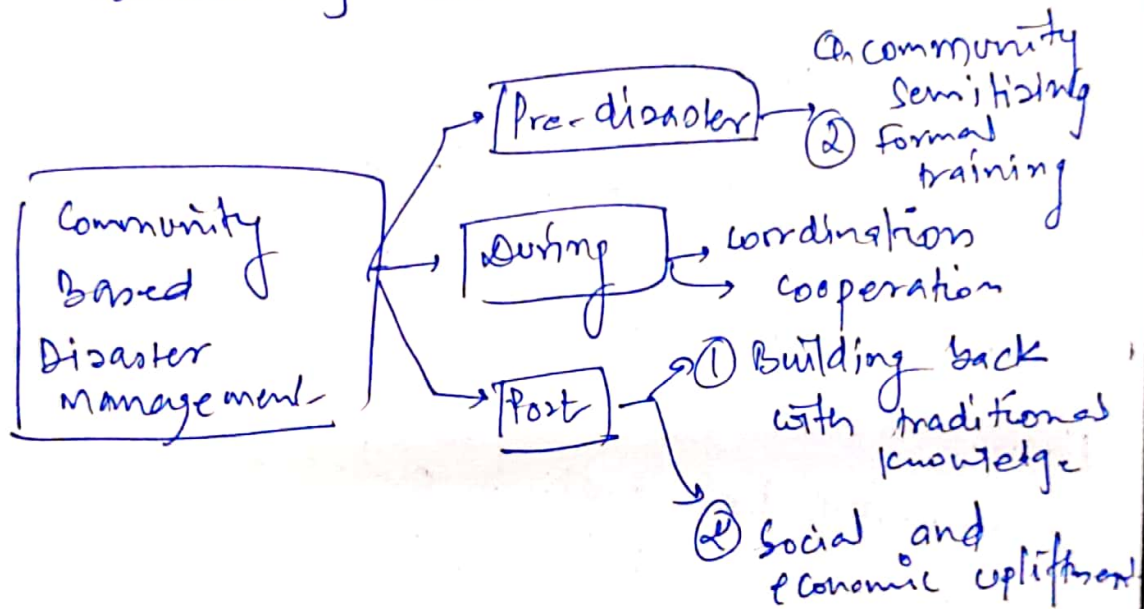
Volcanic winter can help in reducing the global temperature and hence can be positive for climate change.

Don't write anything this margin (यदि शीर्षक में कुछ भी लिखें)

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 is highly prone to multiple disaster including flood, cyclone, drought etc... And hence disaster management becomes very important - especially community-based to minimize the impact.



Other Importance

① Prioritizing the relief work

→ Community-level help can reduce the burden of relief force.

② During cyclone Amphan, many coastal communities in West Bengal started ~~save~~ saving-life even before arrival of relief.

② Efficient work with coordination can significantly save time as it is crucial for life and property damage.

③ Building Back Better
→ Using ~~community~~ workers to build temporary shelters as well as fast rehabilitation

④ Developing mitigation and preparedness plan.

→ Community has best knowledge about nature and impact of disaster, hence they should be promoted in preparedness plan.

Sendai framework also favours community based disaster management which is key focus of India's Zero Casualty Approach.

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।

Ecological footprint represent how much earth is ~~is~~ generating resources and how much resources are human ~~are~~ exploiting.

In 2018, human exploitation would require 1.7 times earth for balance of supply-demand.

It is a useful indicator ~~as~~ of sustainable use.

- ① Assess the ~~g~~ resource generating capacity of earth.
→ this include both → Biotic (fisheries)
Abiotic (~~metal~~ mineral)
- ② Evaluate the resource exploitation by quantifying resource uptake by humans
→ this indicate other important negative externalities.

(2) Increasing use of coal and fuel
based exploitation beyond sustainable
level hampers haemostasis healing
of earth.

(3) Current level of exploitation is
unsustainable

→ Rapidly depleting oil field and
coal reserves

→ Around 40-60% decline in
predator species

(Eg) Lion, whale, & shark.

→ Non-judicious emission of CO_2
and other gas is pushing Hothouse
earth towards tipping point.

Hence a behavioural nudge to
both consumption and production industry
is needed to efficiently utilise and
reduce ecological footprint.

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।

Coastal Regulation Zone (CRZ)
Notification 2018 are released by MoEFCE
in order to address the pressing demand
of economic development along with
coastal region protection.

Balance is reached

① Ban on industrial activity in certain areas and regulation in other zones help in preserving fragile economic system.

② CRZ I A is prohibited for development of any industry.

③ Development of coastal residential and industry beyond CRZ-III region promotes — infrastructure development
— job creation
— more economic activity

③ Government can establish special industries / centres or like atomic research centre in banned zone.

→ This is meant for careful ~~and~~ development of economically important activities in fragile ecosystem.

④ Also CRZ Notification promote -

→ Fisheries

→ Coastal vegetation protection.

⑤ mangroves, Corals etc. are kept in CRZ II

→ Reduction in marine pollution

→ Checking uncontrolled habitation of coastal region

→ Creating vegetative buffer against natural calamity.

Hence CRZ Notification help in fulfilling SDG 14 along with development of coastal economy.

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 क्षेत्रों का एक प्रमुख आदान (इनपुट) रहे हैं। इस संदर्भ में, भारत में उर्वरक उद्योग के वितरण का विवरण प्रस्तुत कीजिए।

Green Revolution in India began in mid 1960s, required huge input of fertilizers for HYV seeds and bumper production.

Fertilizer Industry location in India

① Concentration in Punjab and Haryana

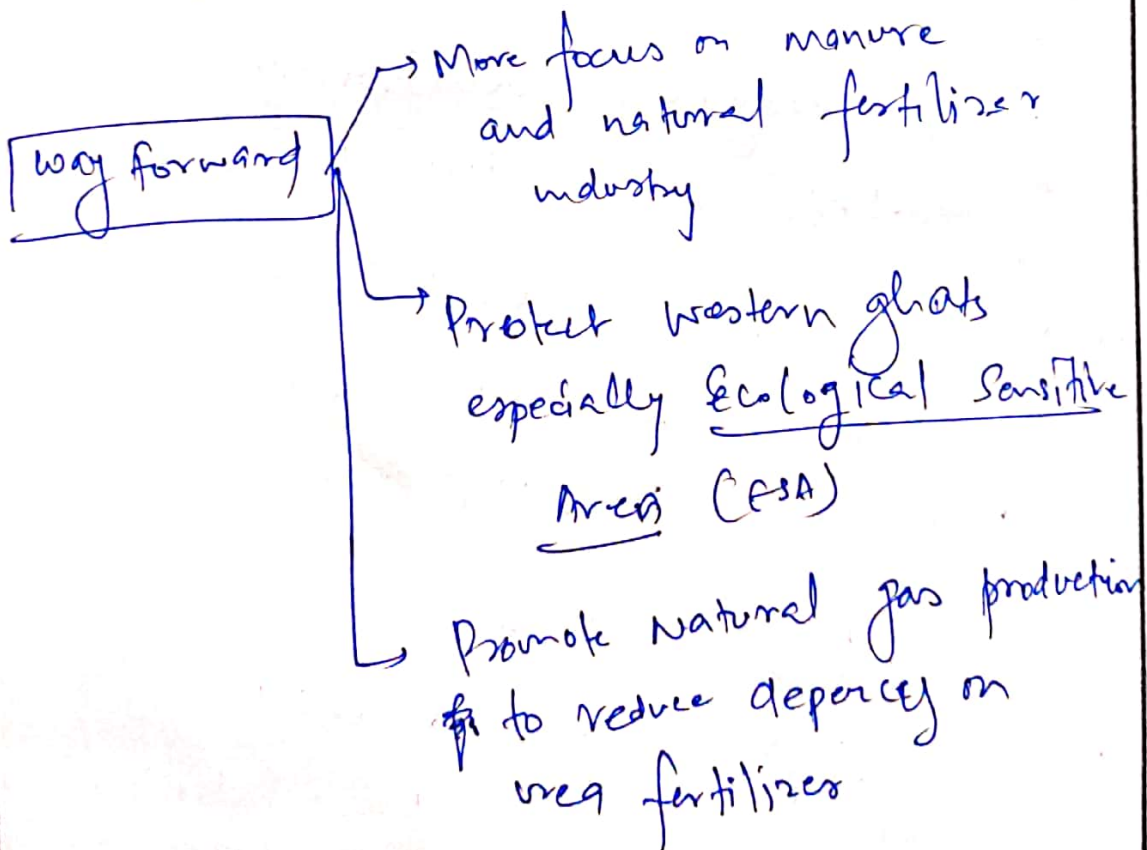
- Due to ready made availability of market due to agri-development.
- Also availability of cheap labour from farms after mechanization incentive fertilizer companies.

② South India (especially western coast)

- Urea requires natural gas which is supplied to South Indian industrial region and hence contribute in Urea industry.

- ③ Growth of organic fertilizer industry in biodiversity rich region.
- ⑤ North-East Indian States
 - ⑤ Western Ghats.

- ④ Scattering industries^{are} also located due to —
- cheap transportation
 - State government incentivisation

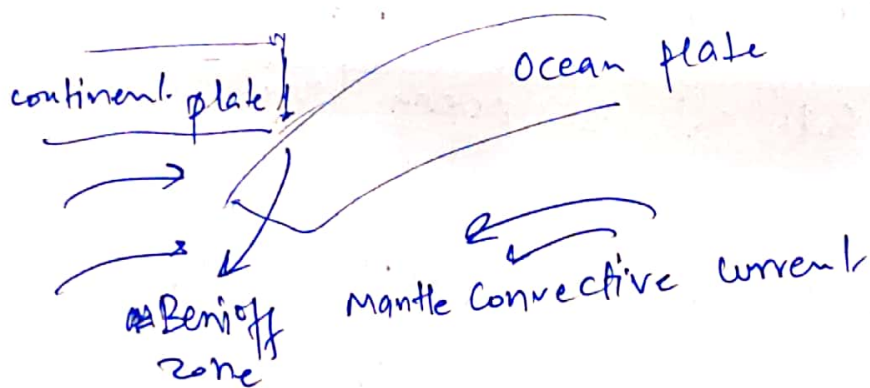


6. Giving example, explain how continental rupture ultimately results in the formation of a new ocean basin. (150 words) 10

उदाहरण देते हुए, स्पष्ट कीजिए कि किस प्रकार महाद्वीपीय विदारण के परिणामस्वरूप अंततः नवीन महासागरीय बेसिन का निर्माण होता है।

Due to tectonic plate, plates undergo divergence, convergence and slipping (transform) movement.

→ Continental rupture refers to the rupturing of continental plate either at continent-continent margin or continent-ocean margin.



→ Continental rupturing lead to movement of continent plate ~~toward~~ which leads more space to ocean ~~basin~~ plate to develop basin

→ Also at convergent zone, the old ocean plate undergo subduction

↓
this material got molten

↓
comes out of mid-ocean Ridge

↓
creating new ocean basin

→ Also the coastal erosion by wave retreat the ~~sea~~ continent.

↓
this also supply more availability of sediment to ocean basin.

Hence in plate dynamics,
the supplanting of one creates another feature or thing.

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।

COVID-19 was first 'notified' disaster by Ministry of Home Affairs as well as a biological pandemic.

COVID-19 exposed domestic laws -

- ① Disruption of federalism
→ Too much centralization of power under Disaster Management Act 2005.
- ② Low flexibility to States, given by Rules.
→ Central government imposed Nation-wide lock down.
- ③ Small window for tackling pandemic
→ No action plan for 'biological disaster'.

→ States could only utilise some provisions of Epidemic Act 1897 to suit to its local demands.

- ④ Archaic and Non-comprehensive laws and Rules.
- ⑤ Access observed by police officers for lockdown violations.
- ⑥ No ready made action plan for prioritizing lockdown/shutting economic activities
- ⑦ Poor use of decentralised power hamper social and economic wellbeing.
- ⑧ Shutting schools was not met by adequate online teaching infrastructure.

Way forward

- Clear - well defined role assigned to each level of government - (including panchayat)
- Better transportation and social well being provisions during pandemic
- More flexibility to state.

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।

2019 saw 2 high intensity cyclone Kyarr and Mah in Arabian Sea which indicate increasing frequency.

Reason

- ① Rising Sea-Surface temperature
 - due to global warming
 - ~~the~~ Hot air current from landmass
- ② changing weather pattern and to circulation of local winds.
- ③ Usually Arabian Sea cyclone are deflected towards African Horn and Persian gulf but increasing landfall on India.

These resulted in formation of a Super cyclone after decades in Arabian Sea.

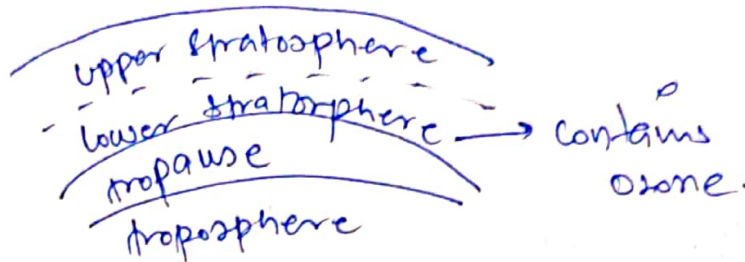
Impact.

- ① Destruction of local vegetation.
 - ② Coral Reefs off-shore Gujarat were impacted due to these cyclones.
- ② Uprooting infrastructure (house, building)
- ③ Disrupting fisheries industry.
 - ④ Fishing communities from Gujarat ~~and~~ to Karnataka has to take precautionary back-steps during cyclone.
 - ⑤ Damaging of many fishing vessel.

Understanding the more frequency and early warning system, a more resilient community based disaster management plan should be carried out for each region.

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?



Sudden stratospheric warming refers to increasing temperature of stratosphere due to stratospheric ozone interaction with insolation or incoming solar radiation.

→ Sudden stratospheric warming promotes the development of Polar Stratospheric cloud Es.

↓
These clouds have tiny ice crystals which can provide easy base for chemical reaction.

During Spring in Southern Hemisphere
these PSC form.

→ PSC enable reaction between
Ozone and chlorine (free)

↓
This begins a chain reaction

↓
Converts O_3 into O_2 (oxygen)

↓
Lead to Ozone depletion.

Similarly, ~~in~~ this year we
Saw an ozone hole over Arctic
circle which was roughly 3 times
size of Greenland.

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 act as a magnetic whose magnetic north and South pole coincide with geographical South and North pole respectively.

Reason → Dynamo effect caused due to liquid outer core which result into circular motions of electrons ~~producing electricity~~ which give rise to magnetism.

→ Earth magnetic anomaly lies in areas where the theoretical and actual magnetic field is different.

(2) Near Himalayas and Andes.

→ Earth magnetism get stored in on either side rocks of mid-ocean ridge which show magnetic bands of opposite Polarity.

Geomagnetism protecting from Solar wind

- Solar wind comprising of charged particles comes from sun towards all terrestrial planets.
- Reaching earth's magnetosphere, these charged particles collide with magnetic line.
- GeoMagnetic stop these particles from entering earth's atmosphere
↓

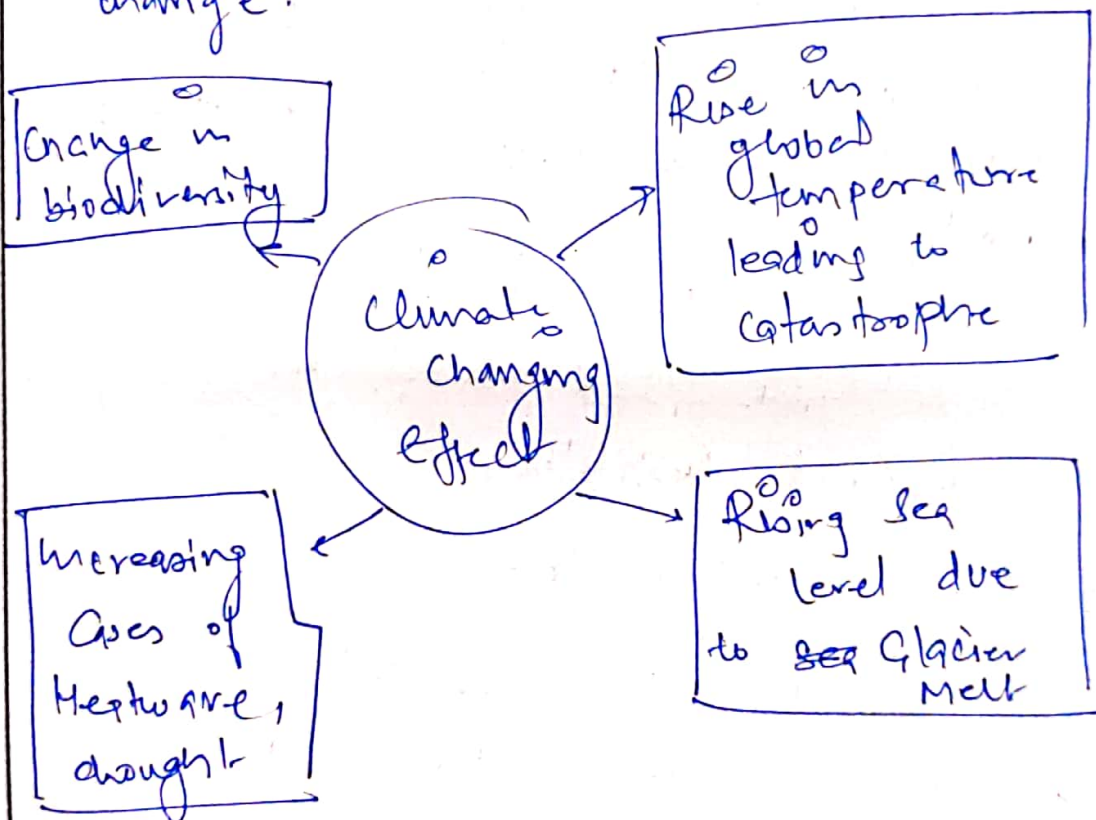
Sometimes in polar regions these glow in spectacular fashion giving rise to phenomenon of Aurora Borealis and Aurora Australis in North and South Pole.

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

(250 words) 15

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

According to IPCC report,
Global temperature is set to breach
1.5°C rise from pre-industrial
level indicating significant climate
change.



Desertification refers to expanding of
desert or conversion of productive
land into desert type infertile land.

Climate change affecting process of desertification

Negative Affects

① changing planetary winds and other winds causing erratic rainfall

eg In Indian subcontinent, rainfall got more erratic, short term and delayed due to change in monsoon winds.

eg Increasing El Nino intensification causing widespread drought in India and Australia.

② wildfire converting forest into desert

eg 2019 Australian bush fire left Sydney and New South Wales desertified.

③ Expansion of desert in neighboring area.

eg Thar desert is intruding towards Aravali

- ④ Reduced / Changed moisture content over land mass -
- ⑤ Eg. Gobi desert is ~~get~~ getting more dry than average.

Positive Affect

- ① Rainfall in un-presented ~~space~~ areas of Sahara causing upgradation of soil.
- ② Increased temperature in high altitudes causing more rainfall in Cold-desert.
→ This promotes reduction of desert extent.

Way forward

- ① Learn from African 'Great-Sahara Belt'.
- ② Use bio-shield to break the desert expanse
- ③ Careful upgradation of already-desertified area.

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।

According to UNISDR, South-East Asian Region especially India is heavily prone to disaster. Hence increasing frequency and intensity of disaster like flood and drought, make 'disaster resilient infrastructure' important.

Need for DRI

① Occurrence of disaster

→ Increased frequency

② Cyclones (like Phan and Moin) in Arabian Sea. disrupting village infrastructure.

→ Increased Intensity

③ More industrial disasters after

lockdown open

④ Vizag accident releasing styrene

② Low preparedness

→ Lack of information

⑤ Inadequate vulnerability analysis
for avalanche and landslide
in Himalayan Region.

→ Lack of Capacity -

Poor
formal
training

Inappropriate
tools and
insufficient
drills

Low
awareness
among
community -

③ Poor state of Infrastructure
→ low Adherence to National Building
code made by BIS

→ low documentation and use of
local wisdom and material.

⑤ Big steel building in Himachal
are heavier than traditional building
material.

→ Low standard of public infrastructure

⑤ Scrapping of Road even in small
inundation in Bihar floods.

Steps taken

→ PM Narendra Modi proposed 'International Coalition for Disaster Resilient Infrastructure' in G20 Summit 2017.

→ India 'Zero Casualty Approach' talks about 'infrastructure pre-preparedness'

→ Disaster specific infrastructure development.

① Retrofitting of old building in high earthquake zones (including Delhi).

② Upgraded platform and deep foundations of buildings in coastal flood prone zone.

→ Use of local material and wisdom.

③ Using local timber for coastal community house construction in Kerala.

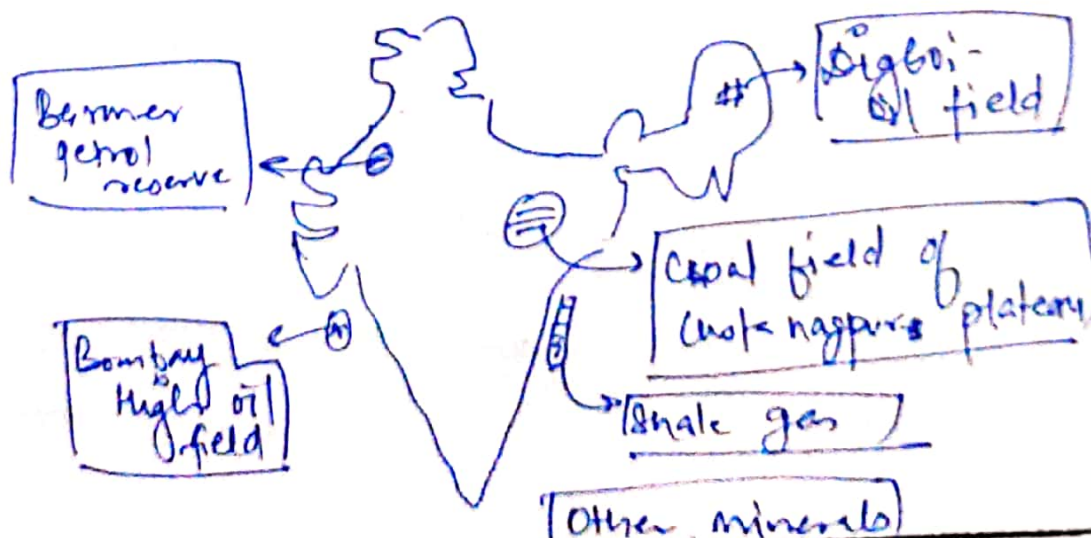
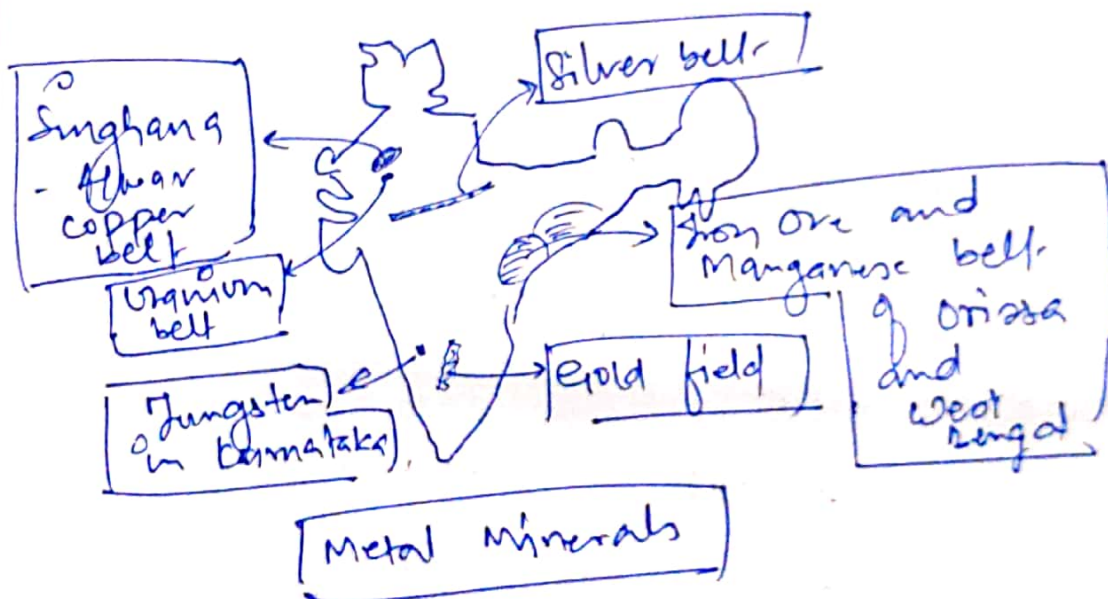
India should focus more on Disaster Resilient Infrastructure as it protects life, property and communication channel during disaster.

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 क्षेत्रों की समस्याएँ 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 rich mineral country containing both metal and non-metal minerals important for economic development.

Important Mineral Belt



Issue Posing Mining

→ Confusion in jurisdiction causing problems.

(1) Minor Minerals come under state but miner & workers is in union list

→ Poor development of mine areas

(2) Improper utilisation of district mining fund cause poor social development.

→ ecological degradation of mining area

(3) limited regrassing after open cast mining.

(4) Leaching out of uranium from mines of Jharkhand to water bodies.

→ old techniques used.

(5) bal. hole mining used in coal mining even after ban by NGT

(6) causes accident and workers death.

National Mineral Policy 2019 seeks to solve this problem -

① Sustainable extraction of minerals.

→ Ecological extraction limit is found to prevent ~~and~~ overutilization.

② Many provision for mineral areas development.

→ (a) Re-grassing the ^{iron-ore} ~~work~~ field after using.

→ (b) Utilization of District mineral fund. for drinking purpose and ~~for~~ other social infrastructure.

③ Reducing import-dependence of minerals on other countries.

④ More job creation and better technology.
Hence National mineral Policy

is positive step towards mineral sufficiency and environmentally as well as socially sustainable development.

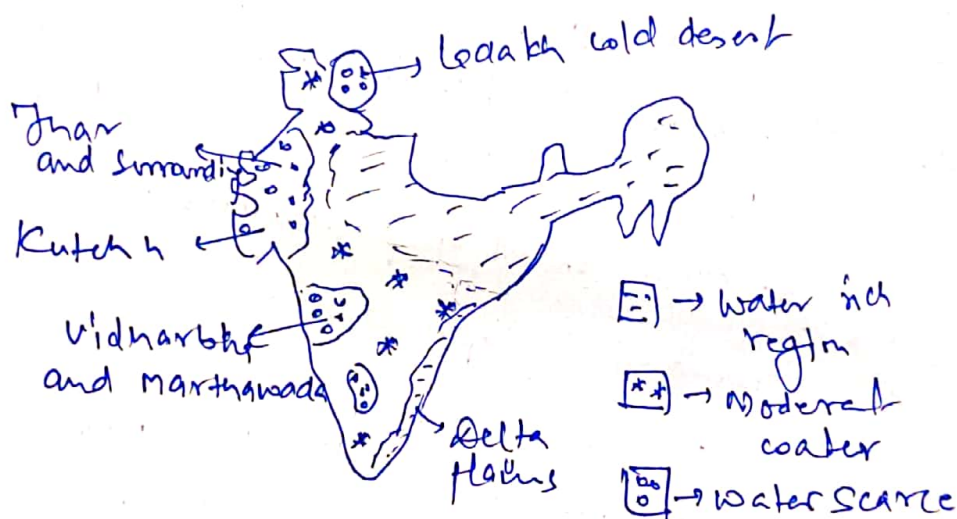
14. Not only is the spatial and temporal distribution of freshwater in India very skewed, but also its usage inefficient and wasteful. Discuss in context of the current water crisis. (250 words) 15

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।

NITI Aayog stated that India is going through 'worst' water crisis. India is a water-scarce country with only 4% of world's water resource.

Skewed fresh water distribution

① Spatial



② Temporal

→ Water-Rich Season → Monsoon
 → Winter Monsoon (for Punjab, North-East India, Tamil Nadu).

- changing monsoon pattern
 - Erratic ~~rain~~ rainfall
 - Delay in outbreak at Kerala coast
 - (Eg) IMD proposed to change monsoon calendar.
 - Small band of rainfall shower.
 - (Eg) Around 95% of major cities like Bombay get rainfall for just 3-27 days.
 - drying of rivers in summer season
- Adding to this grave situation is inefficient and wasteful use of available water

- ① Agriculture
- water intensive crop.
 - (Eg) Paddy preferred over millet.
 - flood irrigation
 - 90% of groundwater extraction used

② Industries → large water quantity used for iron smelting.
→ direct water intake and discharge into freshwater.

③ Household → increasing consumption
→ leisure & uneducated activity.
(eg) Washing car with running water.

Way forward

- Water saving techniques
 - ~~water~~ Rainwater harvesting
 - drip irrigation
- Use of waste-water and treated grey water in industries.
- Learn from from Israel to efficiently use the water resources.

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 has limited resource
(both biotic and abiotic) but 2nd
largest population. Hence, resource
efficiency become core to development.

Resource efficiency can help in following
dimensions of development -

① Economic

→ Sustainable production of resources.

② Efficient ~~utilization~~ extraction of coal

can reduce the coal mining
can result into more years
of ~~extended~~ efficient mining.

→ more jobs and employment

→ Structuring priority of resources can
aid in economic development of
nation.

③ More focus on Processing and servicing
of raw product can shift the focus

from exhaustive primary sector to remunerative secondary and tertiary sector.

→ More efficient utilisation of same resource can increase financial benefit.

(Eg) More efficient oil-refinery in India attract raw-crude oil from \$Iran for processing.

Q2 Social

→ Equitable distribution of resources help in social upliftment.

→ (Eg) More focus on human resource
Investment in rural areas
develop more school and hospital

→ More resource dedicated towards weaker section. This can be possible by efficient resource using

(Eg) financial inclusion programmes like PM Jan Dhan Yojana and social program like MGNREGA can be benefitted by resource efficiency

③ Environment

→ Reducing environment / ecological footprint.

④ more efficient gold extraction from river bed reduce the extraction from mountains.

→ Sustainable resource exploitation
→ this also maintain man-animal harmony.

→ necessary for fauna & flora preservation.

⑤ Regulated hunting of animals can benefit both the eco-system and human.

Hence resource efficiency is important tool and this should be promoted through resource-pricing.

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 has brought HELP guidelines
for exploration and extraction of
hydrocarbons.

Significance of hydrocarbons

① Energy sufficiency

↳ Shale gas can replace petroleum
dependence on Iran and
Gulf countries.

② Financial management.

↳ Natural gas & shale gas can
reduce energy import and
help in reducing current account
deficit.
↑
fiscal deficit.

③ Regional development

↳ Petroleum extraction in Barmer
can greatly contribute the development
of western Rajasthan.

④ Untapping Vast Potential

(eg) Polymetallic Nodules in Indian

Ocean can greatly substitute
to mineral (especially rare-earth
material)

Issues faced during ~~Extraction~~ Exploration

① Offshore location make them hard
to explore.

② Private players do not have
sufficient fund.

③ Deep Ocean exploration require
expertise and manpower.

④ Costly exploration doesnot guarantee
proportional benefit.

(eg) Searching for shale gas reserve
in Indian ocean can be exponentially
financial to for private players.

Issues of extraction

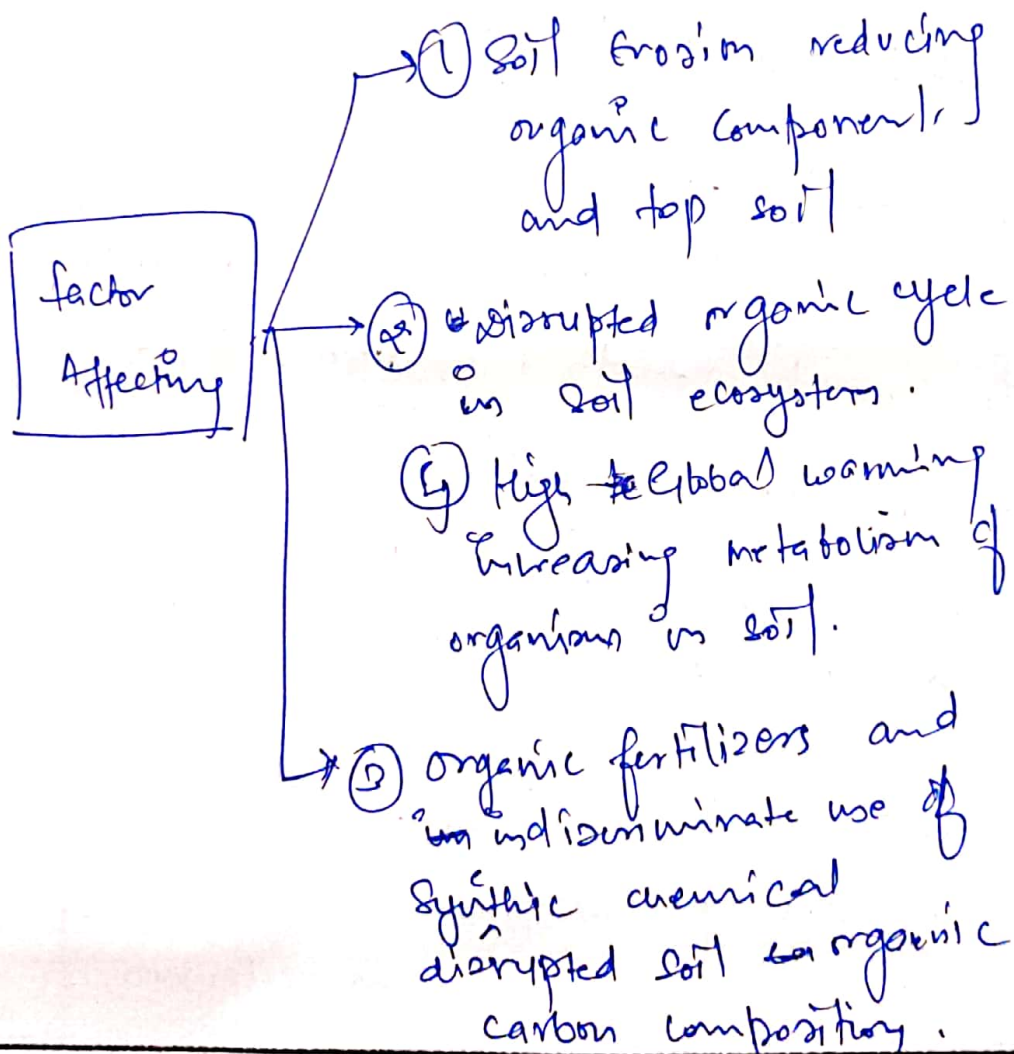
- Lack of technology
- ④ Poor availability of hydraulic technique for shale gas extraction.
- Prone to accidental leakage
- low collaboration effort from developed countries.
- Marketing and buyers uncertainty
- ~~Poor~~ low level of government incentivisation for ~~the~~ technology and capacity.

HELP & guideline will allow single licensing and better revenue model for both government and private player as well as promotion of open-acreage for allotment.

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 कार्यक्षमता पर SOC के लाभकारी प्रभावों पर प्रकाश डालिए।

Soil organic Carbon refers to the carbon stored in the organic component of soil including humus and detritus material.



Other factors include -

→ Increased anthropogenic activities.

(Eg) clearing of forest through
slash and burn method

→ Increased changing pattern of climate.

(Eg) reduction of organic material
available in newly desertified
areas of Sahara Region

Beneficial Impact of SOC

① Soil health →

→ maintain soil ecosystem in equilibrium

(Eg) promote growth of nitrro-bacteria

necessary for nitrogen fixation.

→ keeping soil minerals in balance.
be it micro-mineral or macro-mineral.

→ promote healthy aeration and
water seepage

→ this also promote water-retention.

② functionality

→ More Agricultural productivity

(eg) Carbon is crucial for crops
like wheat and cotton

→ Act as buffer against excessive
fertilizers.

→ Help in Carbon sequestration

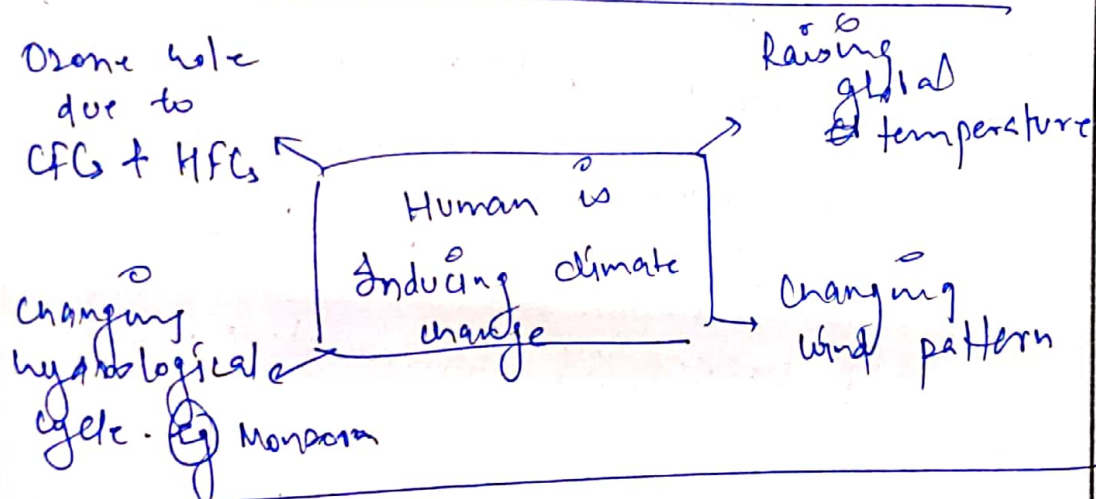
(eg) Reducing carbon from
environment by absorbing
it helps in Global Warming
of increasing temperature.

SoC should be encouraged
by many agricultural practices (eg),
using biochar, preventing stubble
burning and judicious use of
fertilizer.

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 की जाए। साथ ही, विश्व के लिए इसके सामाजिक-आर्थिक और पर्यावरणीय निहितार्थों का भी उल्लेख की जाए।

Ocean deoxygenation refers to
reduction of oxygen concentration or
expelling of oxygen from ocean.



this is resulting into Ocean deoxygenation.

Causes

① Raising temperature.

→ low solubility of gas in warm
water including oxygen
expells it from ocean.

→ Increasing metabolism of marine organism. This impact in 2 ways

- more use of existing oxygen in respiration
- faster decomposition of dead organic material.

② Changing local ocean circulation due to construction of offshore dam
 ↳ Destroying islands
 → This ~~lead~~ allows more mixing of warmer water causing low oxygen level.

Socio-Economic Impact-

① low - Fisheries level
 → Since reduction in fish and crabs in shallow deoxygenated waters.
 → This also lead to Indian fisherman going into Sri Lanka territorial waters for better fishing.

② Poor tourism
 → eg destruction of Corals due to less oxygen impact coral tourism

- ① Women are most affected, as they undertake fisheries as financial alternative practise.

Environmental

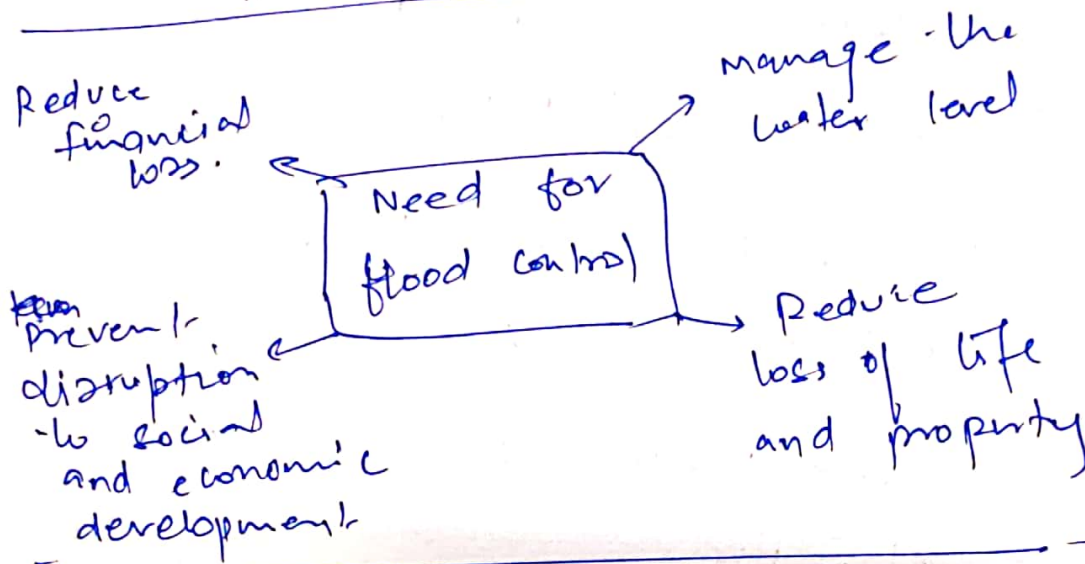
- ① Loss of marine biodiversity.
 (eg) steno. organisms like corals die if oxygen level fluctuate..
- ② Calcification process reduces impacting shell making organisms.
- ③ Change in pH level due to oxygen fluctuation render healthy marine areas barren.

Hence, an international level collaboration is required to mitigate the impact of ~~degradation~~ global warming in oxygen level depletion of ocean.

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।

Rashtriya Barh Ayog state that
40 lakh hectare land in India is
flood prone.



flood control Approach in India is
largely based on piecemeal measures

- ① Largely post-disaster measures
 (eg) Relief work in Assam valley
 floods by ~~relief~~ National Disaster
 Relief force.

- ② More focus on construction of disaster
 specific engineering solutions.

A shift towards integrated basin management is required

- ① Strengthening natural resources for flood absorption.
- ② Desilting large rivers and increasing depth of channel.
- ③ focus on upstream and downstream development.
- Upstream → Tree plantation along slope
check dam
- Downstream → Healthy channel
channel diversion.

③ Use of specific engineering solutions.

1g) Using embankment along kos might not help since it raises its height due to heavy sedimentation and can cause greater threat.

2g) Building flood structures like that of Japan in big cities like Mumbai.

④ Engaging local community
→ local people are 1st responders
→ clearly stating role each section of village including village Panchayat.

* flood water can also be diverted towards water deficit region through a river / stream, interlinking project.

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।

Central Water Commission says that 42 major rivers in India have at least 2 toxic metal contamination.

Reasons

- ① Non-judicious Agricultural practice

② flow of agricultural water rich in Nitrogen and phosphorus in rivers.

→ This even lead to eutrophication along bank.

- ③ Industrial Sector effluent.

④ Kanpur stretch of Ganga is dotted with leather industry discharging in Ganga.

③ Poor implementation of Government programmes.

④ Even after 5 years of Naman
Ganga programmes, very little
tangible change is seen.

④ Behavioural Resistance.

④ Dumping of household garbage
in river.

④ Ganga bathing during Chath festival
and Kumbh Mela.

Steps to rectify

① Engage the local community and
villages.

→ Naman Ganga has promoted
villages through 'Ganga Pranam' steps.

② Decentralised waste treatment plant.

④ Development of such cluster based
treatment in Varanasi has reduced

Contaminant level of toxic metal.

② Increased surveillance on industrial activities.

→ possibly penalize for violators.

④ Behavioural Nudge

eg) A Swachh Bharat showed also promote Nirmal & Anirad river.

⑤ Maintaining ecological flow for self cleansing.

Way forward

→ More research and development.

→ capacity building

→ increased fund and proper monitoring of utilization of fund.