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GENERAL STUDIES (TEST CODE : 1403)

Name of Candidate	Srishti Singh		
Medium Eng./Hindi	English	Registration Number	665492
Center	ON	Date	30/11/20

INDEX TABLE

Q. No.	Maximum Marks	Marks Obtained
1	10	
2	10	
3	10	
4	10	
5	10	
6	10	
7	10	
8	10	
9	10	
10	10	
11	15	
12	15	
13	15	
14	15	
15	15	
16	15	
17	15	
18	15	
19	15	
20	15	

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 than 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।

Total Marks Obtained:

Remarks:

16-B, 2nd Floor, Above National Trust Building, Bada Bazar Marg, Old Rajinder Nagar, Delhi-110060

Plot No. 857, 1st Floor, Banda Bahadur Marg (Opp Punjab & Sindh Bank), Dr. Mukherjee Nagar
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.

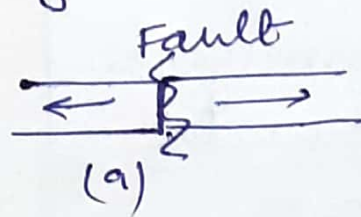
1. Explain how the theory of Plate Tectonics helps in understanding the mechanism of volcanism. (150 words) 10

व्याख्या कीजिए कि प्लेट विवर्तनिकी सिद्धांत ज्वालामुखी की क्रियाविधि को समझने में किस प्रकार सहायता करता है।

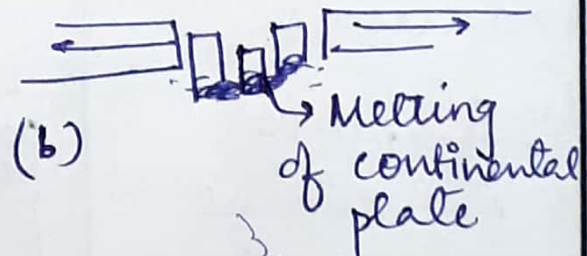
Plate Tectonics theory explains movements of tectonic plates in divergent, convergent & transverse plate boundaries, important to understand volcanism.

Divergent Plate Boundary

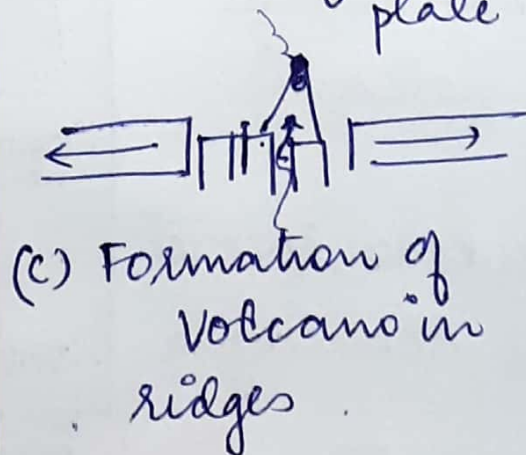
a) Due to plate divergence faulting occurs creating blocks.



b) These blocks subside & melt forming lithospheric magma



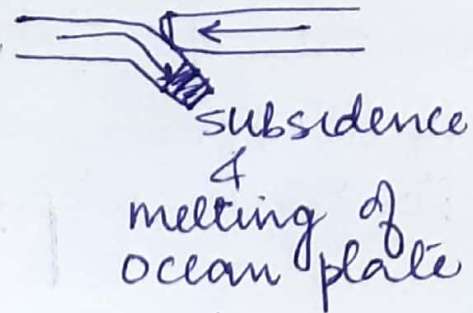
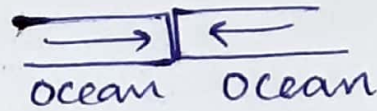
c) This lithospheric magma causes formation of volcanic peaks of caldera & ash and cinder type



eg: Mt Kilimanjaro of Africa

Convergent Plate Boundary

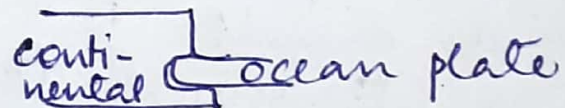
Due to convergence of plates, subsidence occurs creating lithospheric magma & formation of volcanic islands
eg: Sunda Islands.



formation of islands with volcanic peaks.

Further convergence forms continental oceanic plate boundaries & folding, these fold mountains have volcanic peaks

eg: Andes, Rockies
eg: Mt. Aconcagua.



Formation of volcanic fold mts.

These mechanisms help in prediction & understanding of volcanic eruptions in the world

2. Discuss how technology can help India cope with disasters.

(150 words) 10

चर्चा कीजिए कि प्रौद्योगिकी भारत में आपदाओं से निपटने में कैसे सहायता कर सकती है।

Technology can play proactive role in all 4 stages of disaster management - preparation, response, recovery & mitigation

Technology & Disaster Management

a) Preparation

- 1) Analysis of intensity : Through wind graphs, speed patterns.
eg: During upcoming cyclones.
- 2) Vulnerability analysis : Through digital surveys
- 3) Awareness - Through mass media for evacuation of people early to disaster

b) Response

- 1) Identifying damage - Use of satellites, and GPS data

2. Call for help by trapped victims
3. Evacuation: coordination between NDRF, and govt through communication technology -

c) Recovery:

1. Rehabilitation - Through e-medicine for affected areas.
2. Infrastructure reconstruction through geomapping, disaster resilient technologies

d) Mitigation:

1. Preemptive Information through seismography, rainfall analysis
2. Strengthening IMD with modern technologies to acc predictions
3. Capacity Building through online workshops
4. Survey - using drones, IoT.

Technology thus can ensure effective implementation & must be made part of NDMA strategies

3. 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।

Community based disaster management is necessary to evade rising climate risk & disasters. (India 5th most risky towards changing climate)

↳ Global Climate Risk Report

Importance

1. Multiplicity of disasters call for effective utilisation of human force

2. Region specific disasters call for awareness & preparedness of communities

Eg: Cyclones → Coastal Belt

Floods → River banks

Earthquakes → Himalayan region mostly.

3. Preparedness can improve response & reduce impact

Eg: During Fani cyclone, preparedness saved lives in Odisha.

4. Improved & resilient infrastructure construction due to more community awareness

5. Fulfillment of Sendai Framework which calls for community involvement

6. Faster recovery & mitigation after disasters.

7. Generating sense of ownership & belongingness towards disaster management amongst community.

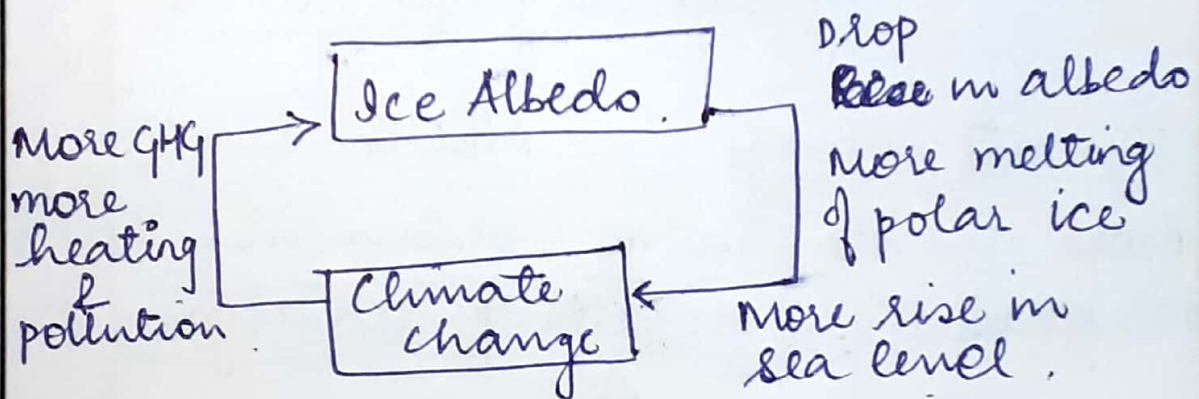
~~These~~ cruciality of community participation needs more inclusive policies of disaster management in India.

4. What is ice-albedo feedback and how is it related to climate change?

(150 words) 10

आइस-एल्बिडो फीडबैक क्या है और यह जलवायु परिवर्तन से किस प्रकार संबंधित है?

Ice Albedo Feedback is a positive feedback, which decreases albedo of ice & effective climate change.

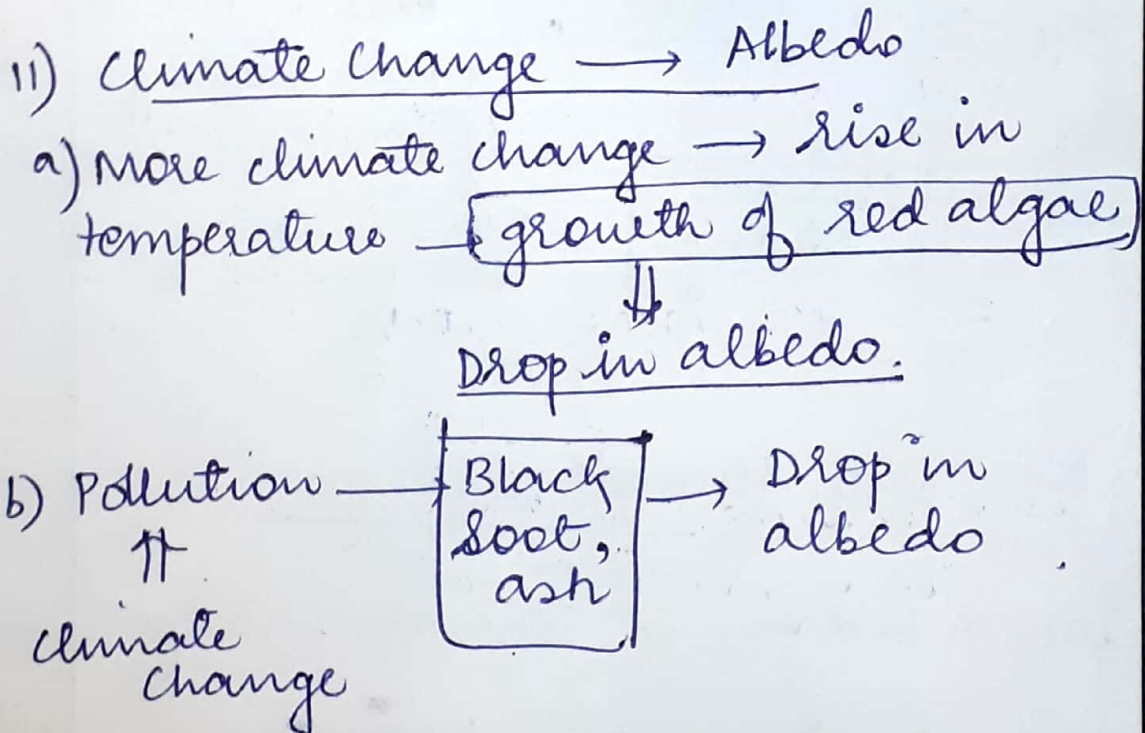
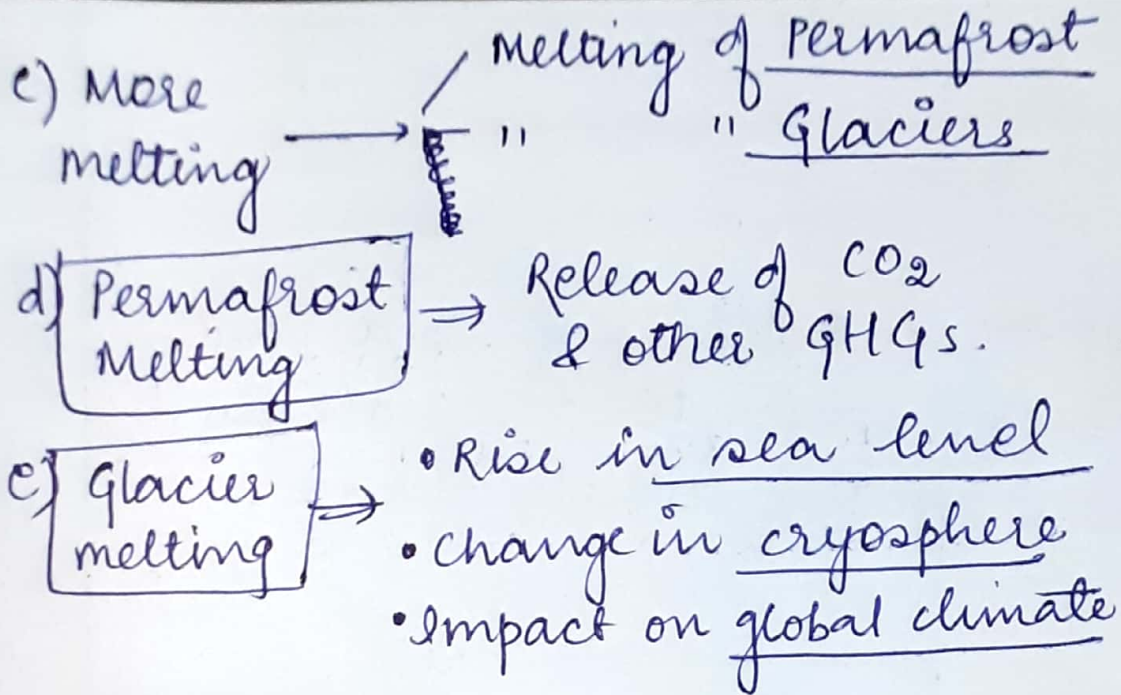


Relation with climate change

±) Ice Albedo → climate change

a) Drop in ice albedo (darker ice) causes more absorption of sunlight

b) More absorption → more melting of polar ice



Thus both albedo & climate change have a cyclic relationship where change in one increases the other.

5. Why has there been an increase in the frequency of Glacial Lake Outburst Floods across the world? Highlight the measures, which can be taken to tackle these floods. (150 words) 10

विश्व भर में ग्लेशियल लेक आउटबर्स्ट फ्लड की आवृत्ति में वृद्धि क्यों हुई है? ऐसे बाढ़ से निपटने के लिए अपनाए जा सकने वाले उपायों को रेखांकित कीजिए।

(GLOF)
Glacial lake Outburst floods are caused due to sudden release of water caused by glacier melting or damage of glacier dams.

Reasons for increased frequency

1. Rise in global temperature by more than 1°C (IPCC report) has caused more glacial melting
eg: Iceland, Hindukush belt saw rise in GLOFs.

2. Damage to permafrost due to mining activities in polar regions ~~also~~ destroys the ^{natural} barriers

3. Ozone Hole - has led to rise in polar temperature and more

GLDFs

4. Poor management of check dams has also caused few cases of GLDFs

Measures needed

1. Under Kigali Agreement, all nations should fulfill their commitments of stopping HFC production.
2. Better mechanisms under UNFCCC to be made towards management of GLDFs.
3. Mining in Arctic region must be strictly managed
4. Control over global warming through strict fulfillment of Paris Treaty

Along with these efforts it is needed to build global effort through diplomatic & institutional means to check GLDFs in future.

6. 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 rise in cyclonic activities in Arabian sea with 6 major cyclones like Maha, Vayu, Kyarr in Western region.

Statistics

- Recent years have seen growing frequency of cyclone in Arabian sea, which earlier diverted towards Middle East.

- Arabian sea traditionally reported low no. of cyclones due to:

1. low fresh water mixing due to less rivers

2. Lack of ITCZ formation.

3. Poor strength of cyclones

Reasons

1. Global Warming : Rise in temperature of Arabian sea due to ~~change~~ more GHGs, creating cyclones
 2. Disposal of industrial sludge Resulting in rise of surface temperature
 3. Climate Change causing shift in wind patterns & exceptional rise in surface temperature
4. All these factors have resulted in rise in ~~Asst~~ cyclones & hence, there is need to monitor the activities to manage them in future.

7. 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 is a temporary phenomena of sudden rise of stratospheric temperature by 50°C or more.

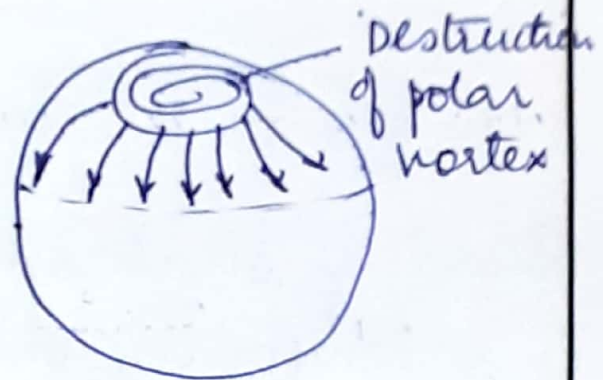
This ~~is~~ has been common in recent years due to :

1. Occasional weakening of polar vortex over Arctic & Antarctic region
2. change in wind patterns changing westerly flow directions & strength in upper atmosphere.

Result :

1. It ~~creates~~ weakens polar

vortex & results in subsidence
of air



Effect on ozone hole

1. Since polar vortex is effective contributor of ozone hole, rise in temperature results in small sizing of ozone hole

2. This is due to reduction of chemical reactions which are facilitated by polar clouds

Due to these incidents, ozone hole in 2019 was reported to be smaller over Antarctica.

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

Volcanic Winter is the drop in temperature due to rise in albedo of earth after volcanic eruption of large scale.

It has been experienced in :

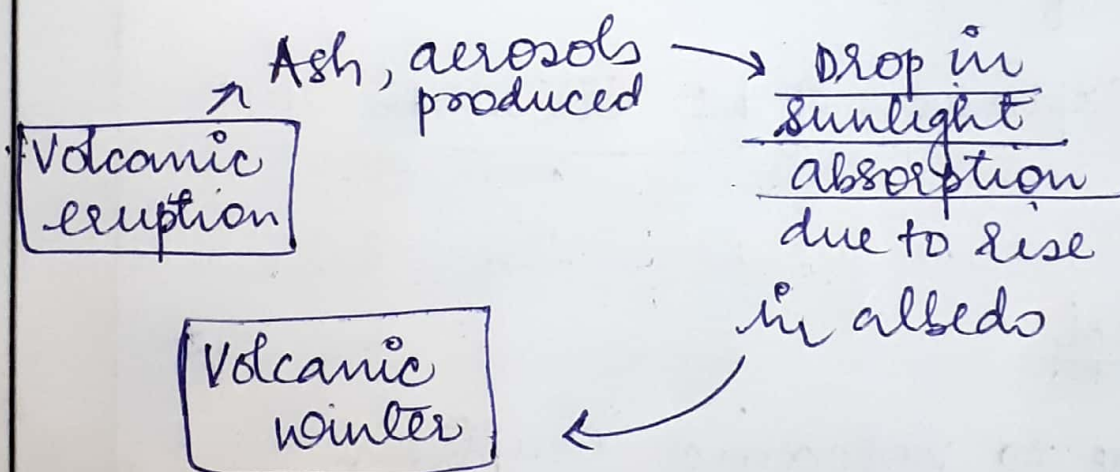
1. Krakatau volcanic winter of 1890s

2. Explosion of Mt. Etna in 2019.
etc.

Concept :

a) Due to volcanic eruption various sulphur aerosols & ash is produced, which is light in colour

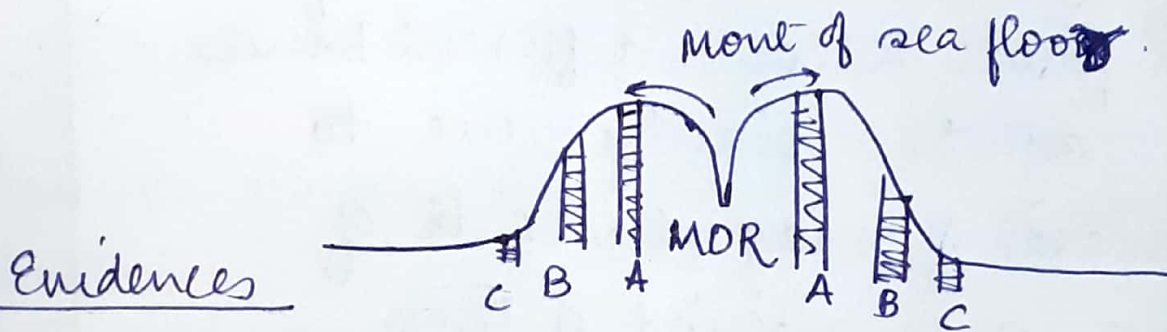
- b) Due to ~~lava~~ ash production region is covered by such clouds which shield sunlight absorption
- c) Due to more albedo of ash, further reflection of sunlight occurs
- d) This results in drop in temperature, often termed as volcanic winter



The phenomenon has played important role in evolution of life ~~is~~ on earth & is important ~~of~~ impact of volcanic eruptions in modern times.

9. Bring out the prominent evidences that have been put forward in support of sea-floor spreading. (150 words) 10
सागरीय-अधस्तल विस्तार के समर्थन में प्रस्तुत किए गए प्रमुख साक्ष्यों का उल्लेख कीजिए।

Sea Floor spreading theory was given by Harry Hess to explain constant movement of sea floor.



1. Age: The sea floor has been proved to be much younger than continental crust, proving that it had been formed few thousand years ago.
2. Distance from MOR
Sea floor of same age equidistant from Mid Oceanic Ridge.

3. ~~the~~ Age of rocks gradually increase as we move away from MOR

eg: In the fig - $C > B > A$.
←
Age.

4. Magnetism - The samples of sea floors show different bands of magnetic polarity due to reversal of magnetic field of earth over a period of time

Recent studies of geo-mapping of ocean floor, satellite data & better probes have also supported this hypothesis.

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

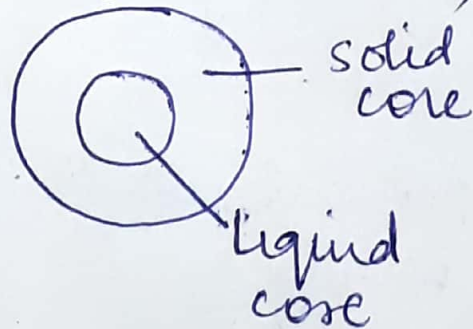
पृथ्वी के चुंबकत्व तथा सौर पवनों से पृथ्वी की रक्षा में इसकी भूमिका पर संक्षिप्त टिप्पणी लिखिए।

Earth's magnetic field, often term 'geomagnetism' is instrumental and produced due to its metallic core.

Reason for earth's magnetism

a) The core of earth comprises of ferromagnetic minerals such as Fe

Core of Earth (NiFe)



b) Due to suspension of liquid material & inside a solid core at a temperature of 5500°C, the material produces an electric field

c) This is due to movement of earth

on its axis supported by Coriolis forces.

c) Due to this electric field, a magnetic field is generated perpendicularly (Theory of electromagnetism)

d) This field changes its polarity over millions of years

Protection from solar wind

a) The geomagnetism helps in repelling solar flares which are basically charged particles beyond ionosphere

b) This protects earth from harmful solar winds

Magnetism also contributes towards phenomena such as Auroras happening in the Poles.

11. Explaining the origin and mechanism of Indian monsoon account for the uneven distribution of monsoonal rainfall in India. (250 words) 15

भारतीय मानसून की उत्पत्ति और क्रियाविधि की व्याख्या करते हुए, भारत में मानसूनी वर्षा के असमान वितरण का विवरण प्रस्तुत कीजिए।

Indian monsoon is a complex phenomenon of seasonal rainfalls in India, which is influenced by multiple factors.

I) Origin & Mechanism

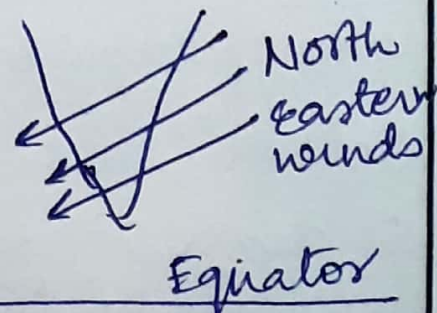
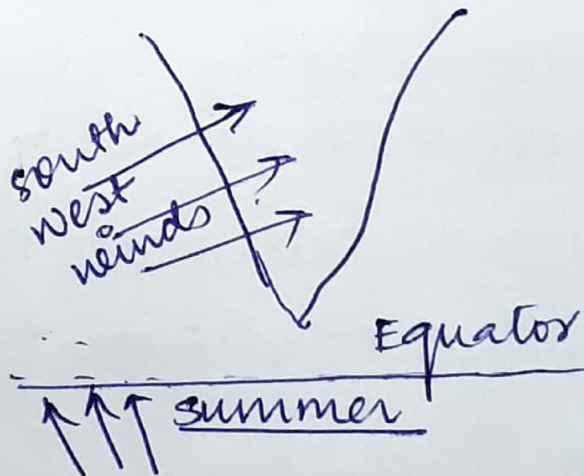
a) Basic Mechanism

Due to creation of low pressure

over Indian subcontinent

during summer,

Tropical easterlies cross equator, pick moisture from Indian Ocean & cause summer monsoons.



During winters due to higher pressure, these winds move in north east direction, resulting in smaller winter monsoons

b) Factors influencing monsoon

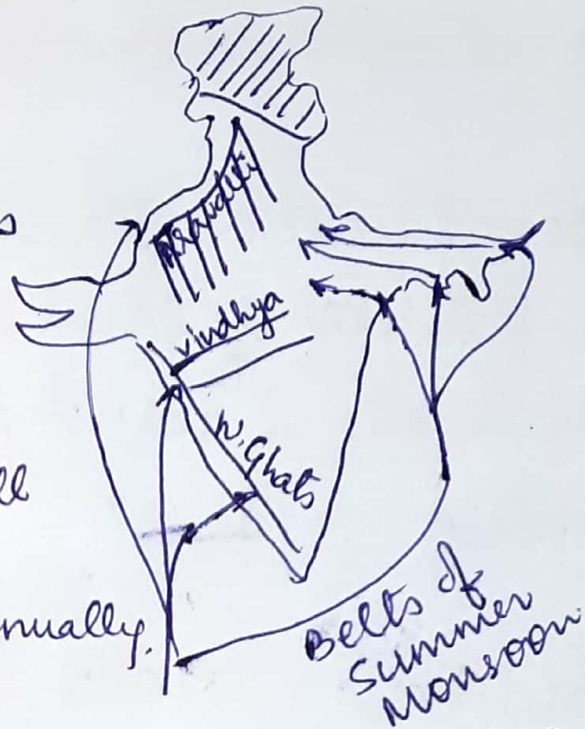
- (i) Position of ITCZ over India (monsoon trough) causing rainfall uptill himalayan foothills
- (ii) Importance of himalayas - Create a branch of jet streams ~~due to~~ (Sub Tropical Easterly Jet stream) which intensifies monsoon
- (iii) Tibetan Plateau - Intensifies low pressure conditions
- (iv) ENSO - Determines surface pressure temperature condition of Indian ocean
- v) MJO - Circulations which may improve/suppress rainfalls
- vi) Walker Cells
- vii) Indian Ocean Dipole
- ix) Western Disturbances due to temperate cyclones etc.

Uneven Distribution

1. Indian monsoon unevenly distributes across country

North East & W. Ghats
- very high rainfall
(200 cm annually)

Rajasthan - 25 cm annually.



It is due to:

shaded area - rain shadow

~~mentioned~~

a) Orography creating rain barriers on leeward side

b) Distance from coast of central India

c) Regions of Tamil Nadu coast don't receive monsoon in summers but in winters due to distribution of rain belts (shown in figure)

All these factors along with the factors affecting monsoon create uneven & complex mechanism of rainfall.

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

(250 words) 15

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

Desertification stands for decrease in fertility of land, dropping its productivity & turning into a wasteland / desert.

According to UNCCD, more than 30% of Indian land is under influence of desertification.

Impact of Climate Change :

1. Temperature : Rise in global temperatures by over 1°C according to IPCC report, have resulted in :

- Decrease of soil productivity & drop in moisture
- Death of flora & biodiversity which sustains land.

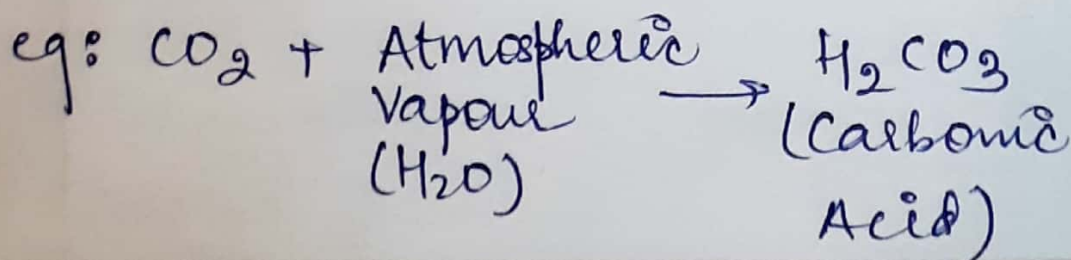
2. Rainfall - Due to rising droughts & floods, caused by climate change, rainfall has turned erratic, creating:

- Poor soil & land in low rainfall areas → drylands

- Washing away of fertile soil due to flooding of low lying areas.

3. Acidification - Due to rise in toxic compounds in soil, soil has turned acidic and it has dropped fertility.

4. Greenhouse gases - ^{Being} ~~are~~ the centre reason of climate change, their higher concentration has resulted in drop in soil health.



5. loss of biodiversity such as trees, burrowing organisms such as annelids have led to poor soil binding

6. Soil Organic Carbon has been lost due to lesser biodiversity & more toxification of soil.

7. Salinity of soil & land has increased due to use of eutrophicated water for irrigation, which is in turn boosted by climate change

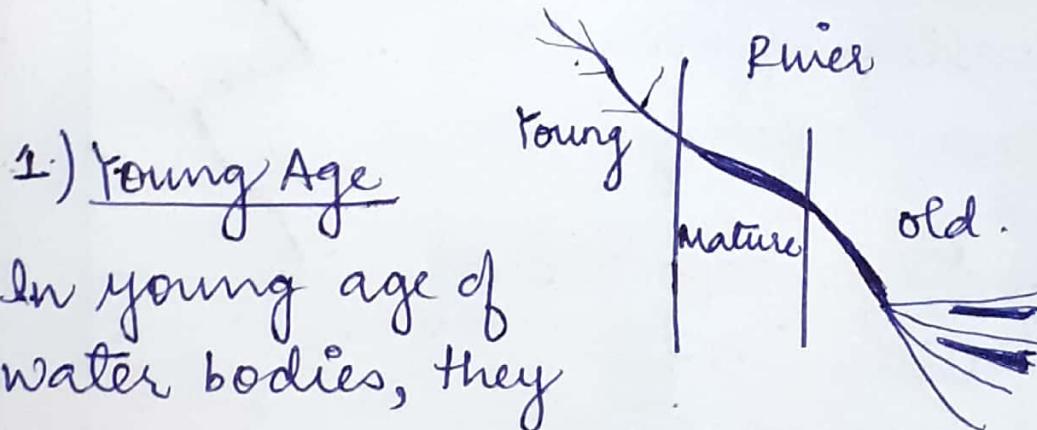
It is hence necessary, to make conservation mechanisms & fulfill targets committed under UNCCD, to ensure Land Degradation Neutrality in future.

13. Give an account of landforms that are shaped by running water as it erodes, transports and deposits sediments. (250 words) 15

प्रवाहित जल द्वारा अपरदन, परिवहन और तलछटों के निक्षेपण के कारण निर्मित भू-आकृतियों का ब्यौरा प्रस्तुत कीजिए।

Running

Water is an important natural agent of exogenous processes creating various landforms.



1.) Young Age

In young age of water bodies, they emerge out of mountain sources, glaciers, lakes etc

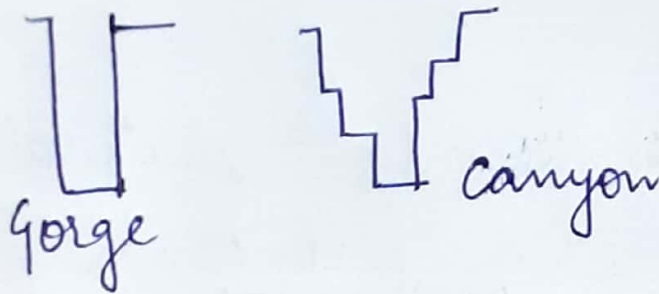
They form:

(a) Rills, gullies through small streams cutting through rocks.

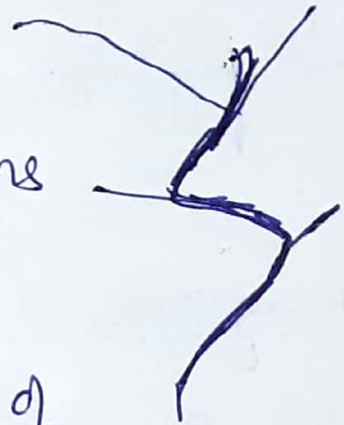
(b) Erode rocks creating V-shaped valleys

c) Form waterfalls, potholes etc due to gradient.

d) Gorges & canyons while cutting through rocks.



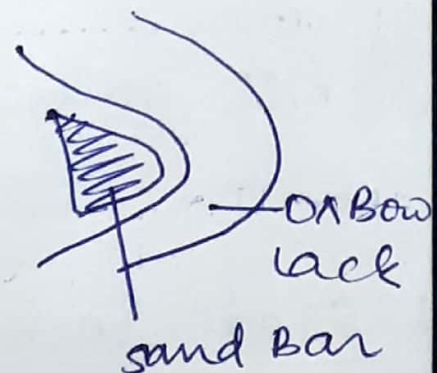
c) Interlocking spurs → along valleys of mountains
eg: Kashmir Valley



(II) Mature Stage - Deposition of gravels, alluvium etc
(speed becomes slower)

(a) Plains - due to deposition of fertile alluvium.

(b) Ox bow lakes where erosion & deposition occurs simultaneously



(c) Point & Sand Bar

(d) levees : Thick deposits around river channel

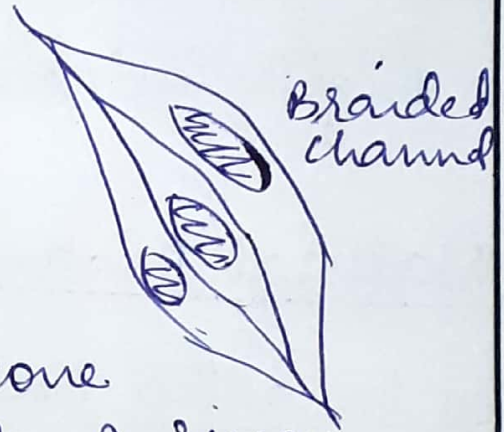


e) Flood plains in lower course.

(iii) Old Age - river very slow,
overloaded with sediments

(a) Distributaries - divides into
various streams forming braided
channels

(b) Estuaries - If river
doesn't flow through
plains & flows through
rift valleys it forms zone
of merging of sea water & river



(c) Deltas - Triangular pieces of
extremely fertile land formed by
depositions

d) Riverine Islands eg: Majuli Island

Thus running water in rivers create
various landforms which play important
role in socio-economics of humans.

14. India is vulnerable to a large number of natural as well as man made disasters on account of its geo-climatic and socio-economic conditions. Elaborate. (250 words) 15

भारत अपनी भू-जलवायु एवं सामाजिक-आर्थिक परिस्थितियों के कारण वृहद संख्या में प्राकृतिक के साथ-साथ मानव-निर्मित आपदाओं के प्रति सुभेद्य है। सविस्तर व्याख्या कीजिए।

According to Climate Risk Report, India has been 5th most vulnerable country. Coupled with socio economic conditions, India is highly vulnerable to disasters.

(1) Natural Disasters

(a) Geoclimatic conditions

1. Himalayas — high tectonic activity, frequent landslides, earthquakes.
2. Floods — Due to heaviest rainfall regions such as Mawsynram in India, heavy rainfalls are common annual floods in Bihar, Assam, Western Ghats etc.

3. Droughts - Due to dependance on monsoons, most part of central India is susceptible to droughts.
4. Volcanic eruptions in Barren Island of Andaman & Nicobar.
5. Tsunamis due to proximity with Ring of fire in south east Asia eg: Tsunami of 2005.
6. Earthquakes - Most of India under zone 4 & 5 of seismicity.

(11) Socio Economic factors.

1. High population - India has very high population of 130 crores with highest environmental migrants in 2019.
2. Poor Infrastructure resulting in increased vulnerability of country.

3. Poverty: creating inequality towards access to disaster prevention, poor living conditions

4. Urbanisation - Improper urbanisation has resulted in growth of flash floods, biological disasters such as COVID-19.

5. Destruction of biodiversity has caused more risk in eco sensitive zones.

6. lack of awareness due to illiteracy creates more vulnerability for India.

Thus, India needs to seek a multi pronged policy under NDMA to ensure holistic disaster management.

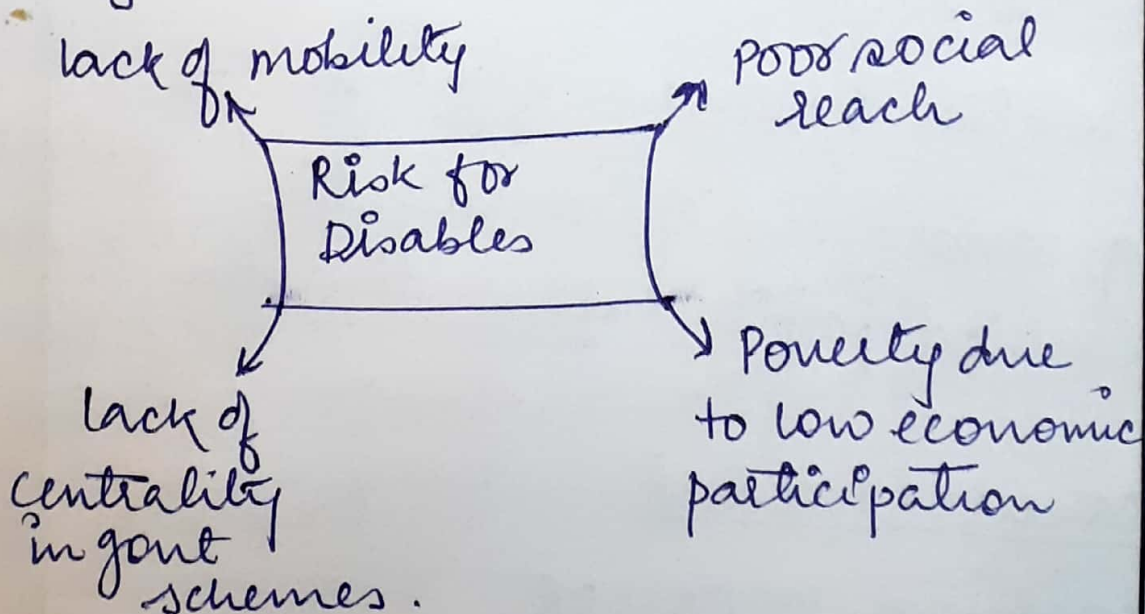
15. Discuss the need for mainstreaming disability perspective in the efforts towards disaster risk reduction. Also, suggest some measures that can be taken towards Disability-inclusive Disaster Risk Reduction. **(250 words) 15**
 आपदा जोखिम न्यूनीकरण के प्रयासों की दिशा में निःशक्तता संबंधी परिप्रेक्ष्य को मुख्यधारा में समाविष्ट करने की आवश्यकता पर चर्चा कीजिए। साथ ही, निःशक्तता-समावेशी आपदा जोखिम न्यूनीकरण की दिशा में अपनाए जा सकने वाले कुछ उपायों का सुझाव दीजिए।

Disability inclusive Disaster Risk reduction is central to the global standards of Disaster Management under Sendai Framework

Need for mainstreaming :

1. Ensuring equity in protection

Vulnerable sections have way higher risk towards disasters



2. Major part of death load of disasters comprises of such disabled sections

3. Economic Cost of rehabilitation of these people is higher due to disability & difficult rehabilitation

4. Social Indices are disparate towards them, so they can't themselves face disasters
eg: Poverty, Unemployment, Diseases

5. Lack of accessibility creates difficulty in movement during disasters

6. Violation of Human Rights due to ~~my~~ ignorance of vulnerable disabled people during disaster.

Measures Needed

According to UNDRR,

2) Disaster management must include following:

a) Chair of Disabled on policy maker's table

b) Freedom of speech to raise issues

c) Support in social, political & economic domain by govt.

d) Awareness of govt towards disabled in disasters.

2) Also human rights violations must be checked against disabled.

Along with these provisions it's necessary to create policy mechanisms under NDMA to facilitate disaster management for disabled.

16. Explain the causes and consequences of sea level rise. (250 words) 15
समुद्र के जल स्तर में वृद्धि के कारणों एवं परिणामों की व्याख्या कीजिए।

Sea level rise is predicted to be up to as high as 200 cm by 2050, if current trends continue.

It has been detrimental to climate & biodiversity & raised global vulnerabilities

causes of sea level rise:

1. Global Warming which has caused increased surface heating of oceans & changed rainfall patterns
2. Melting of polar ice due to global warming has led to rise in ocean levels.

3. Thermal Expansion of water due to rising temperature has risen sea levels.

Consequences of sea level rise

1. Environmental:

- (a) Threat to biodiversity of low lying areas. Also polar melting has led to threat to polar biodiversity.
- (b) changes in ocean cycles due to thermal expansion. eg: Thermohaline cycle.

2. Economic

- a) loss of land: eg: submergence of Jakarta → shift of Indonesian capital
- b) loss of economic activities in low areas
- c) Economic cost of rehabilitation of migrants

3. Social

- a) Migration of people.
- b) Increase in vulnerability
- c) Loss of livelihood 🌱
- d) Prone to tsunamis, floods etc
- e) Cyclones → Due to thermal effects are also boosted

4. Political - stress on policy making in coming years.

5. Technological

- a) Issues of management of plants in lower area
- b) Threat of nuclear leak

6. Ethical ~~concern~~

- a) Migrants issue would create ethical dilemma to govt.
- b) Resource shortage would create issues

Thus sea level rise would create multipronged issues, which needs to be dealt with enabling of Paris Treaty at the earliest

17. Highlight the factors responsible for occurrence of heat waves and its effects on life and economy. In the light of recent guidelines given by NDMA, describe measures to reduce the negative impact of heat waves.

(250 words) 15

हीट वेव की घटना हेतु उत्तरदायी कारकों तथा जीवन एवं अर्थव्यवस्था पर इसके प्रभावों को रेखांकित कीजिए। NDMA द्वारा हाल ही में जारी किए गए दिशा-निर्देशों के आलोक में, हीट वेव के नकारात्मक प्रभाव को कम करने के उपायों का वर्णन कीजिए।

Heatwaves are hot spells of abnormally high temperatures, typically in central India.

Criteria: More than 40°C temp in plains & 30°C in hills. (IMD)

Factors:

1. Rise in global temperature: This has caused severe hot spells in recent years.
2. Lack of vegetation due to deforestation reduces cooling effect.
3. Urbanisation creating heat island effect.
4. Industrial Activities cause more GHG emission & heat traps.

5. Ozone depletion leading to more insolation

6. lower albedo of land in absence of vegetation

Effect

1. On life -
 - (a) slowdown of day to day activities
 - (b) Threat of 'loo' attacks
 - (c) sickness, dehydration
 - (d) loss of lives due to heat strokes.

2. on economy -

- a) slowdown of economic activities due to reduced efficiency of workers
- b) Additional burden for cooling facilities
- c) lesser output \Rightarrow low exports
- d) Threat to crops due to high temperature
- e) Threat to cattles & animals

Guidelines of NDMA

- a) Reduce unnecessary exposure during afternoon hours.
- b) Early warning must be given to public.
- c) Management of shelters for homeless.
- ~~d~~ d) Limiting working hours.

Other measures

- a) Checking dehydration of working labours → facilities of ORS at sites.
- b) Schools must be closed in such conditions.
- c) Water & food supply must be checked to avoid casualties.

Along with these steps, an integrated portal for temperature could be created for general public to ensure early preparedness.

18. 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।

In the light of rising climate change & anthropogenic disasters, climate resilient infrastructure becomes extremely needed.

Need :

1. High vulnerability

(a) Variety of disasters → floods, earthquakes, landslides, etc.

(b) Intensity of disasters grown in recent years.

eg: More than 8 earthquakes in Delhi region during 2020 summer.

(c) High population leading to more casualties.

d) Poverty & hunger — death
by disaster often accompanied
by hunger deaths

2. Global commitments under Sendai
Framework, Yokohama Convention,
India being a member

3. Human rights protection under
signed conventions of UNHRC & UNDRR.

4. Archaic Infrastructure due to
low investment & awareness.

5. Economic burden of rehabilitation
much greater than creation of
climate resilient infrastructure

• According to Sendai Framework,
investment of \$1 in Disaster Mgmt
saves \$7 of economy.

Steps taken:

(1) CDRI - launched by Indian PM, to create a global alliance for disaster resilience in transport, communication, accommodation etc.

- Aims for technology sharing
- Architecture of global collaboration through regular meeting, funds etc.

(2) Formation of NDMA & funds at 3 levels for creation of infrastructure.

(3) Guidelines for safe infrastructure in commerce.

(4) Promotion & awareness campaigns

A lot more needs to be done through more mechanisms of easing disaster resilient infrastructure in general masses.

19. Give an account of the natural and man-made causes of forest fires. Highlighting the challenges associated with forest fire management in India, mention the different components of the National Action Plan on Forest Fire. (250 words) 15

दावानल के प्राकृतिक एवं मानव जनित कारणों का विवरण प्रस्तुत कीजिए। भारत में दावानल प्रबंधन से संबद्ध चुनौतियों पर प्रकाश डालते हुए, दावानल पर राष्ट्रीय कार्य योजना के विभिन्न घटकों का उल्लेख कीजिए।

Forest fires are common in India with 60% of forests under influence of high or medium intensity fires annually (FSI)

Causes

(I) Natural :

(a) Summer heat can often trigger forest fires.

(b) Lightening : often lightening on trees triggers forest fires

(c) Climate cycles : eg: IOD reason of Australian fires.

(II) Manmade :

(a) Climate Change : High temperature

due to rise of global temperature.

b) To kill pests - Forests are burnt to kill insects, pests, wild animals etc.

c) Agriculture - To obtain more land

d) Housing - To get land for habitation

e) Collection of forest produce such as Mahua Flowers.

Challenges:

1. Improper mechanisms of monitoring
Forest fires are difficult to monitor & control

2. Fast spread causes huge destruction of forest property

3. Political nexus stops mechanisms of control of manmade fires

4. lack of surveillance in India
5. Poor technology
6. lack of training & capacity building

Promision of National Action Plan for forest fires

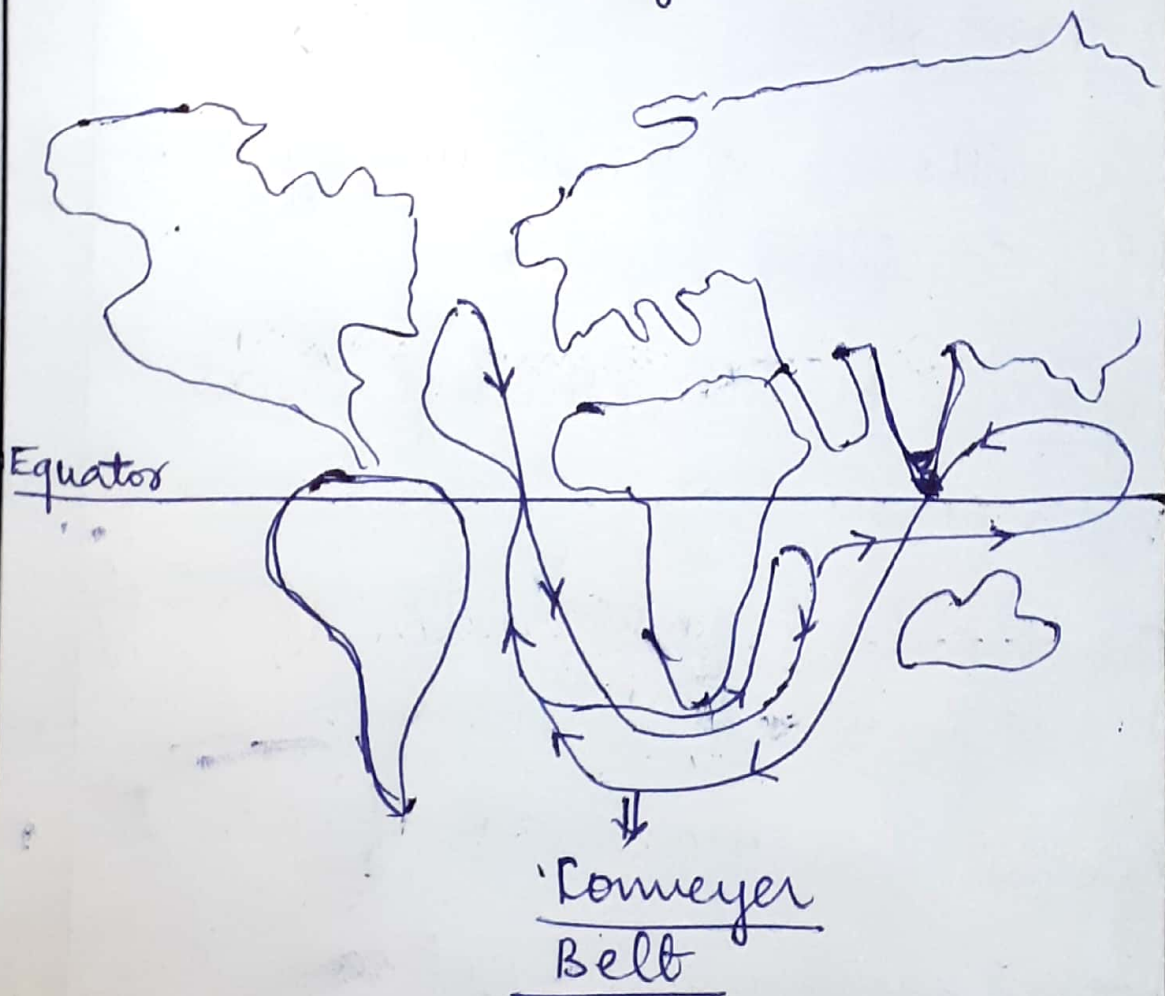
1. Surveillance of forests using GPS, satellites, drones.
2. Capacity building through cross border cooperation
3. Involvement of locals to effectively manage forests
4. control over manmade fires

Further mechanisms such as Joint Forest Management can prove helpful in this regards.

20. What is the global ocean conveyor belt? Discuss its significance for marine ecosystem. (250 words) 15

वैश्विक महासागर कन्वेयर बेल्ट क्या है? समुद्री पारिस्थितिकी तंत्र के लिए इसके महत्व की विवेचना कीजिए।

Global ^{ocean} conveyor belts are continuous movements of large water masses across the oceans of the world.



Mechanism

1.) Due to colder polar water, the water grows dense & sinks

creating a void

2) This enables movement of ocean water towards ~~tropics~~ poles from ~~tropics~~ tropics

3) This cycle is completed due to continuous movement of water from ~~the~~ polar regions to tropics & vice versa.

Significance for marine ecosystems

1. Intermixing of nutrients uniformly across oceans. → more nutrients for ecosystems

2. Balancing temperature of water which is crucial for marine life, corals etc.

3. Managing salinity by bringing fresh water from polar regions.

4. Upwelling - due to continuous movement of water creates better living conditions for fishes
5. Migration of various marine organisms is synced to these conveyor belts
eg: Turtles -
6. Maintain oxygen levels & calcification limits → crucial for marine ecosystems
7. Support marine food chains & bring fresh food for smaller organisms

Thus these cycles are necessary for biological & metabolic sustenance of marine ecosystems