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GENERAL STUDIES (TEST CODE : 743)

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Medium Hindi/Eng.	English	Registration Number	09977
Center	R.N.	Date	29/08/16

INDEX TABLE

Q. No.	Maximum Marks	Marks Obtained
1	12.5	
2	12.5	
3	12.5	
4	12.5	
5	12.5	
6	12.5	
7	12.5	
8	12.5	
9	12.5	
10	12.5	
11	12.5	
12	12.5	
13	12.5	
14	12.5	
15	12.5	
16	12.5	
17	12.5	
18	12.5	
19	12.5	
20	12.5	

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 HINDI and ENGLISH.
इसमें बीस प्रश्न हैं तथा हिन्दी और अंग्रेजी दोनों 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 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।
- 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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103, 1st Floor, B/1-2, Ansal Building, Behind UCO Bank, Dr. Mukherjee Nagar, Delhi – 110009

EVALUATION INDICATORS

1. Alignment Competence
2. Context Competence
3. Content Competence
4. Language Competence
5. Introduction Competence
6. Structure - Presentation Competence
7. Conclusion Competence

Overall Macro Comments / feedback / suggestions on Answer Booklet:

1.

2.

3.

4.

5.

6.

All the Best

All the questions are compulsory and carry 12.5 marks each.

1. Elucidate the differences between tropical and temperate cyclones. Also, give an account of the global distribution of tropical cyclones.

उष्ण कटिबंधीय और शीतोष्ण कटिबंधीय चक्रवातों के बीच अंतरों को स्पष्ट कीजिए। साथ ही, उष्ण कटिबंधीय चक्रवातों के वैश्विक वितरण का विवरण प्रस्तुत कीजिए।

Tropical cyclones - There are the cyclones which originate near equator [10°N - 10°S]

Extra tropical cyclone i.e. Temperate cyclones - These originate near 30°N - 60°N and 30°S - 60°S .

Differences between tropical and temperate cyclones -

(1) Primary circulation for the tropical cyclones is Trade winds while that for temperate cyclones is westerlies. This is the reason that temperate cyclone move west to east while tropical cyclone move east to west.

(2) Tropical cyclones are associated with convective rainfall while temperate cyclones result in frontal precipitation.

- (3) Temperate cyclones exist entire year while tropical cyclones originate generally at Nov - to Feb
- (4) Tropical cyclones are more destructive as compare to Temperate cyclones as the reason being more heat and cumulonimbus clouds.
- (5) Tropical cyclones have circular isobars while Temperate cyclones have elliptical isobars.
- (6) Diameter of Temperate cyclones is greater than tropical cyclones
 i.e. Tropical $\text{Dia} = 800 - 1000 \text{ km}$
 Temperate $\text{Dia} = 1000 - 1600 \text{ km}$
- It must be noted here in distribution of cyclones that tropical cyclones do not originate in South Atlantic ocean as 1/22

is not formed because sea surface temperature is low

Global distribution of tropical cyclones

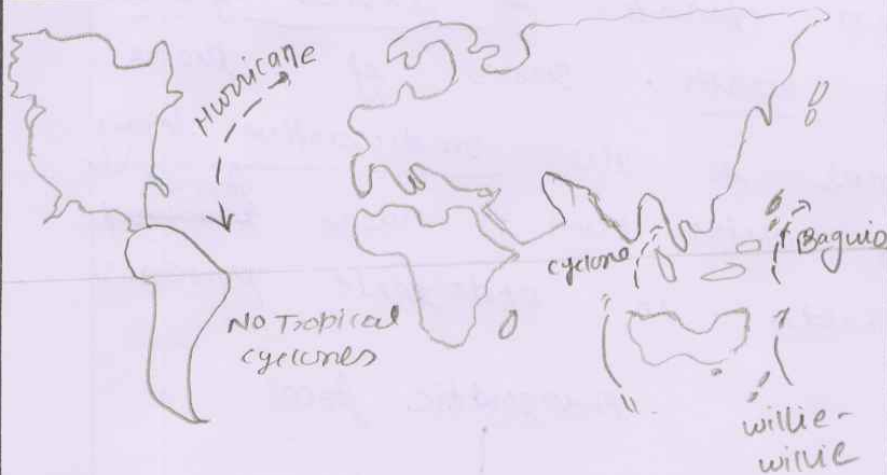


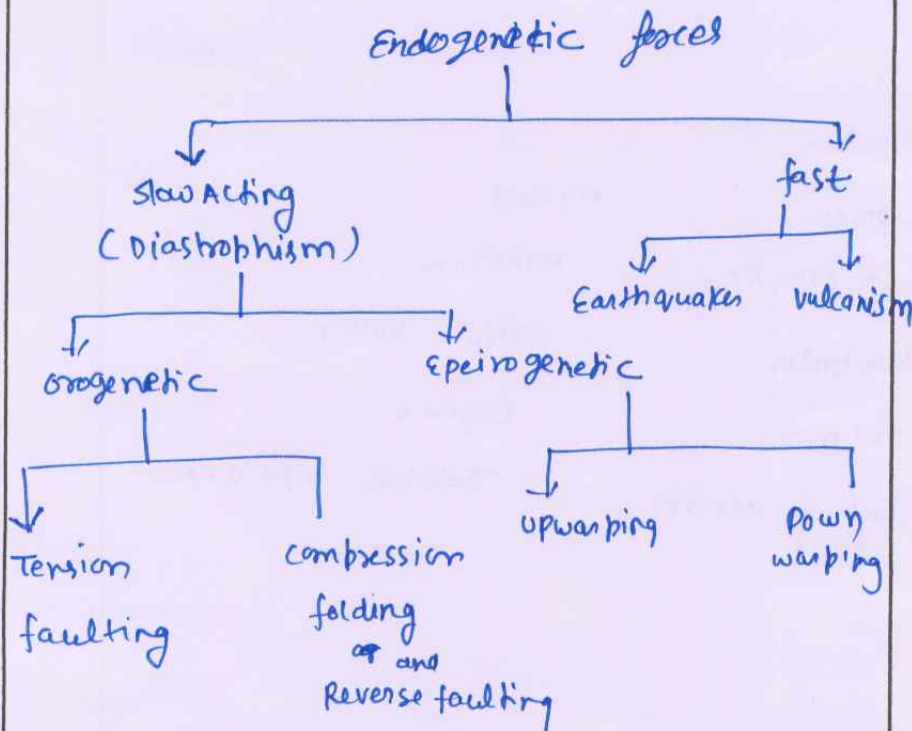
fig 1.1- P

place	NAME
North Atlantic	Hurricane
Australia	willie - willie
Philippines	Baguio
Indian ocean	tropical cyclone

2. What are Endogenetic forces? Illustrate their role in the formation of various landforms.

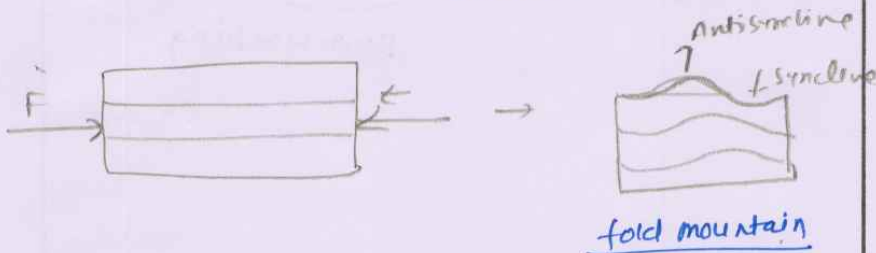
अंतर्जनित (इंडोजेनेटिक) बल क्या हैं? विभिन्न भू-आकृतियों के निर्माण में उनकी भूमिकाओं को सोदाहरण स्पष्ट कीजिए।

Endogenic forces are the forces which operates from inside the earth. source of these forces is the radioactive decay in outer core. These ~~processes~~ ^{forces} results in endogenic processes.

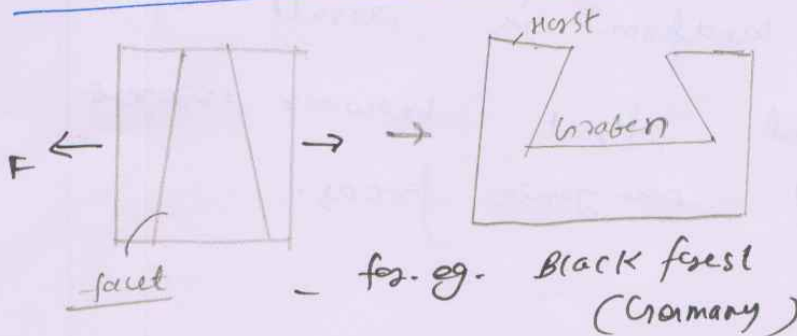


classification and role of endogenic forces

Folding - folding refers to buckling of
earth crust and results in
fold mountains due to compression.
for e.g. Himalayas India Am. &
Rockies - N. America
Andes - S. America



faulting - it refers to movement of
blocks along a weak zone (i.e. fault)
due to tensile forces or extreme
compression and results into -
Horst-graben topography.



(3) Epeirogenic movements - There are due to radial forces.



(4) Vulcanism -



Conical Hill or Dome is formed

~~These~~ present assemblage of landform is result of eternal fight between exogenic and endogenic forces.

3. Enumerate the global targets and priorities for action of the Sendai Framework for Disaster Risk Reduction. Discuss the positive features and limitations of the framework.

आपदा जोखिम न्यूनीकरण हेतु सेनडाई फ्रेमवर्क के अनुरूप कार्रवाई के लिए वैश्विक लक्ष्यों और प्राथमिकताओं की गणना कीजिए। इस फ्रेमवर्क की सकारात्मक विशेषताओं और सीमाओं की चर्चा कीजिए।

Sendai framework was adopted as a successor to hyogo framework for disaster management. This framework will continue to achieve the goals relating to disaster setup in Yokohama conference.

positive features
(1) It will give greater emphause on community based disaster management.

- (2) It has given thrust to the preventive measures during disaster.
- (3) It says that vulnerability analysis of the disaster is the key to mitigation.
- (4) It aims to utilize the technological advancements in disaster prediction especially - earth quakes.
- (5) It says that women, children and old age are more prone to disaster and specific measures

must be adopted for prevent

- (6) It has set priorities according to disaster specific measure.
(7) Emphasis on disaster education

Limitations

- (1) It fails to lay down any frame work for cross border cooperation during disasters.
(2) It is mainly a repetition and not successor of Hyogo frame work.

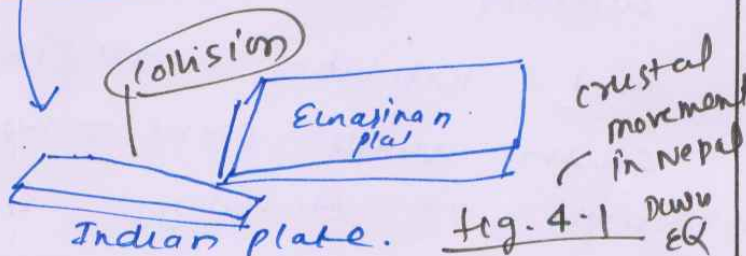
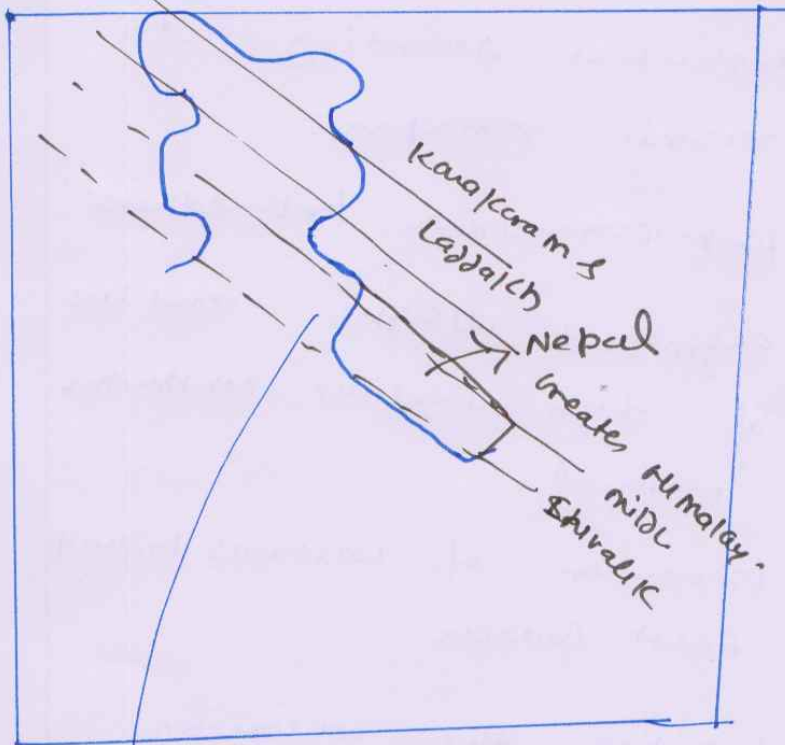
(3)

4. Elaborate on the crustal movements that led to the Nepal Earthquake in 2015 and subsequent aftershocks that continued for months. Enumerate the measures that can be taken in advance to mitigate the effects of such disasters.

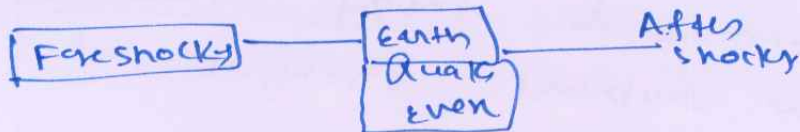
उन भूपर्पटी संचलनों की सोदाहरण व्याख्या कीजिए जिसके कारण 2015 में नेपाल का भूकम्प और उसके बाद कई महीनों तक झटके आते रहे। उन उपायों की गणना कीजिए जो इस प्रकार की आपदाओं के प्रभावों के न्यूनीकरण हेतु समयपूर्व अपनाए जा सकते हैं।

Nepal Earthquake was due to
seismically active zone in
Himalayan region. In Himalayan
region Indian plate is
colliding with Eurasian
plate.
~~later~~ In this movement
Indian plate is going —
beneath the Eurasian plate.
As a result, energy
has been stored in the
interior which resulted —

into devastating earthquake
in Nepal in 2015 as the
stress ~~at~~ energy exceeded
the rupture strength of
the rocks.



This resulted into motion of energy release.



measures

- (1) constructions according to seismic zonations
- (2) prep. community preparedness
- (3) Engineered designs and use of high quality construction material.
- (4) prevention of Reservoir Induced Earth Quakes
- (5) Limiting the construction and habitation work in Earth quake prone zones especially in Himalaya

5. Explain the phenomenon of Sea Floor Spreading. Analyse how this discovery acted as a precursor to the development of Plate Tectonics Theory.

'सागरीय अधस्तल विस्तार' की परिघटना की व्याख्या कीजिए। विश्लेषण कीजिए कि इस खोज ने प्लेट विवर्तिनिकी सिद्धांत के विकास में अग्रदूत की भूमिका का निर्वाह किस प्रकार किया है।

Sea floor spreading → This theory was propounded by Harry Hess. He advocated that due to radio-active forces inside the earth-oceanic crust gets spreaded and results in formation of ridges and other land forms.

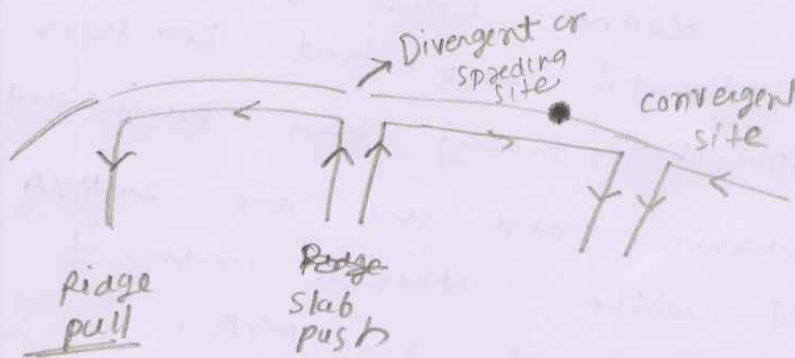
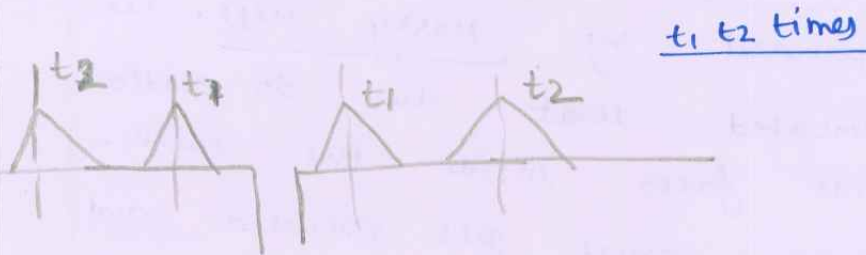


fig. 5-1 - Convection cell model of sea floor spreading.
(Arthur Holmes)

When sea floor spreads due to convection cells - then magma

comes out and new crust is created thus sea floor spreading sites are constructive in nature.



Significance

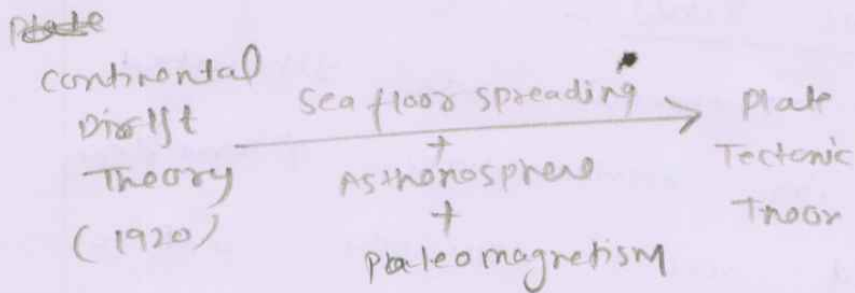
(1) ~~Earlier~~ it was believed that oceanic crust is older than continental crust but sea floor spreading theory had proved that oceanic crust are are 200 MYA old while continental crust is as old as 3200 MYA.

(2) it helps in determining paleomagnetism

(3) contribution of sea floor spreading to plate tectonics

Alfred Wegener could not elaborate forces while explaining continental Drift theory.

Sea floor spreading gave input to plate tectonic — regarding operating forces while plate movements input was taken from continental Drift theory.



6. Explain the phenomenon of Tsunami formation and highlight reasons for India's vulnerability to Tsunamis. List some measures to mitigate the impact of Tsunamis.

सुनामी उत्पन्न होने की परिघटना की व्याख्या कीजिए और सुनामी के प्रति भारत की सुभेद्यता के कारणों पर प्रकाश डालिए। सुनामी के प्रभाव का न्यूनीकरण करने हेतु कुछ उपायों को सूचीबद्ध कीजिए।

TSUNAMI - TSU + NAMI 's
(harbour waves)
a Japanese term meaning
"harbour wave" as these are
mainly observed along Harbours.

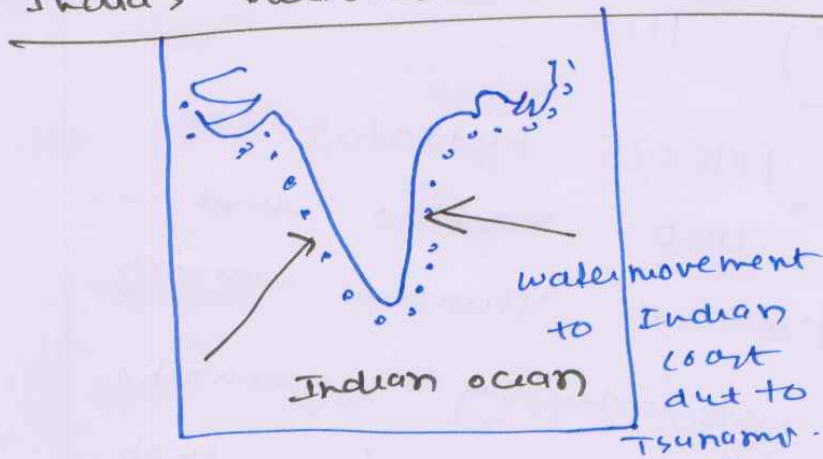
Formation of Tsunami and Tsunami-
genic Zones -

- (1) Tsunamis are generated in Earthquake prone Zones and occurs especially due to faulting.
- (2) ~~then~~ Tsunamis also occurs due to sudden upheavals in oceanic surfaces and

any thing that can
'Drastically Transform ocean
surface' can bring Tsunami.

For-eg - 2004 tsunami was
due to A major earthquake
in Indian ocean.

India's vulnerability to tsunami



India has long coastline
of 7600 km and extensive
development in coastal area

- (1) many Rice cultivation areas are located in coastal areas
- (2) poor fishermen are also living coastal areas.
- (3) Industries etc

Measures

- (1) TEWS - Tsunami Early warning system has been started by IMP.
- (2) INCOLS Hyderabad under IMP monitors and - forecaster Tsunami warning
- (3) strengthening communities to be prepared for such events
- (4) construction of walls in coastal areas as done up Japan.
- (5) mangrove vegetation (Green shield)

7. Explain the role of Himalayas in influencing the climate of South Asia. Enumerate the changes observed recently in the Himalayan region with respect to climate and geomorphology. What are the possible anthropogenic causes behind them?

दक्षिण एशिया की जलवायु को प्रभावित करने में हिमालय की भूमिका की व्याख्या कीजिए। हिमालयी क्षेत्र में जलवायु और भू-आकृतिविज्ञान के संबंध में हाल ही में चिन्हित किए गए परिवर्तनों की गणना कीजिए। इनके पीछे संभावित मानवजनित कारण क्या हैं?

Himalaya Act as a huge -
climatic, physical and cultural
barrier factor and influences the
climate of south Asia in -
following way -

(1) It separates the Indian-Sub-
continent from Eurasia.

(2) It prevents cold winds -
coming from Siberian -
Anticyclone.

(3) Role in Indian monsoon →
Himalaya plays an important
role in monsoon by blocking
South-~~west~~ ^{west} winds.

Change in Himalaya with respect to climate and geomorphology.

- (1) Retreating glacier — Due to climate change.
- (2) Increased Land slides and Avalanche Events
- (3) Seismic Cracks — There are the areas where statistically an earthquake is due.
- (4) Events of floods and flash floods had increased and
2014-15 Jammu - Kashmir flood was catastrophic.

⑤ Anthropogenic causes

- (1) Increased human interference

due to tourism and habitation
etc.

(2) Due to deforestation of -
Himalayan forests.

(3) establishments of research
centres such as AIRIS
Telescope and high
altitude research centre.

(4) These anthropogenic -
factors had adversely -
impacted the flora fauna
and resulted in numerous
disasters.

8. The first ever SAARC disaster management exercise, named SAADMEx, was recently hosted by India whose theme was "one SAARC, one response". Discuss the need for cooperation among SAARC countries for 'Disaster Risk Reduction'. How can India contribute to the same?

प्रथम बार आयोजित साडमेक्स (SAADMEx) नामक सार्क आपदा प्रबंधन अभ्यास की हाल ही में भारत द्वारा मेजबानी की गई थी, जिसका केन्द्रीय भाव था "एक सार्क, एक अनुक्रिया"। सार्क देशों के बीच 'आपदा जोखिम न्यूनीकरण' के लिए सहयोग की आवश्यकता पर चर्चा कीजिए। भारत इस हेतु किस प्रकार योगदान कर सकता है?

SAARC countries are vulnerable
to many disasters due to
their location in seismically
active zone in himalayan
belt. Apart from this few
countries ~~are~~ have boundaries
to oceans as well increasing

their risks.

This necessitates for
the effective cooperation
among the countries.

First, such initiative was —
establishment of SAARC disaster
management Authority with —
its headquarters in New
Delhi.

SAAR countries discussed in
SAADMEEX about —

Preventive measures

- (1) Installation of alert system
for earthquakes and Tsunami.
- (2) cross boundary cooperation
in case of disasters.
- (3) mock exercise to
prepare communities

They also discussed for —
~~the~~ post disaster consequences

- (1) Such as effective rescue,
and rehabilitation”

India's contribution

- (1) India During Nepal —
Earthquake, India was —
the first responder to
disaster from international —
community
- (2) India has recently mooted
the idea of SAAR Satellite.
- (3) India has installed ~~SAAR~~
TEWS ~~eg~~ and Earth
quake alert system
- (4) CNARIC / IRNSS can also help
in predict disaster for
SAAR cons

9. What impact does earth's revolution have on hemispherical advent of seasons and on length of the day? In this regard, discuss the concept of Daylight Savings Times (DST) and evaluate its utility in India.

ऋतुओं के गोलार्द्धीय आगमन और दिन की लम्बाई पर पृथ्वी के परिक्रमण का क्या प्रभाव पड़ता है? इस संदर्भ में दिवलोक बचत समय (डेलाइट सेविंग टाइम- डी.एस.टी.) की अवधारणा पर चर्चा कीजिए और भारत में इसकी उपयोगिता का मूल्यांकन कीजिए।

Earth makes a revolution of sun in around 365 days and it is an important factor in determining seasonality in earth.

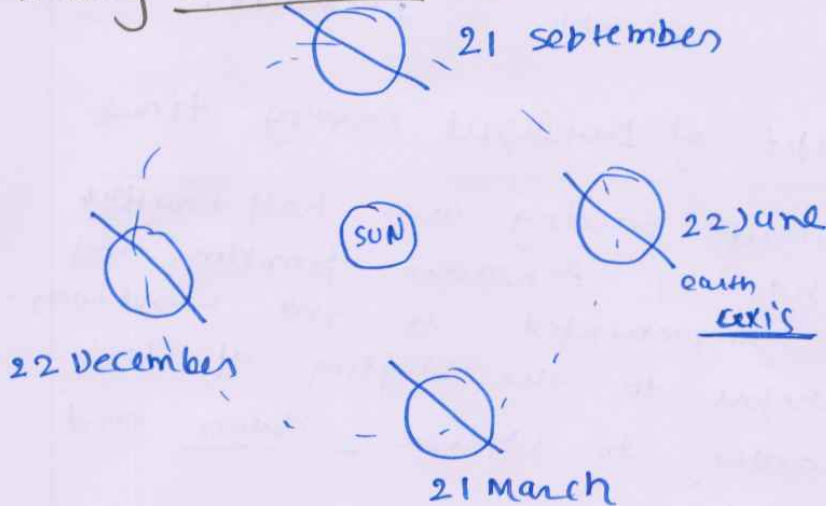


fig. 9.1 - March of sun and seasonality due to revolution

Date	phenomenon	Sun's Declination
21 March	Vernal Equinox	0°
22 June	Summer solstice	$23\frac{1}{2}^\circ \text{N}$
21 September	Autumn equinox	0°
22 December	Winter solstice	$23\frac{1}{2}^\circ \text{S}$

- (1) when Northern hemisphere is sun-facing then days are longer in Northern hemisphere. (from 22 March to 21 Sept)
- (2) when Southern hemisphere is sun-facing then days are longer in Southern hemisphere (from 22 Sept to 21 March).

concept of Daylight saving time

Daylight saving was half heartedly proposed by Benjamin Franklin and later implemented in 2nd world war. It refers to the shifting of clock in order to utilize dawn and twilight.

procedure

- (1) Generally, clocks are shifted ahead hour later in April last weekend and reversed in October last weekend.
- (2) Since, Dawn and twilight time

is very low near equator -
this concept is not very useful
~~in eq~~ near equator.

Evaluation of DST in India

(1) Central India and North India
has a difference of 20-25 longitude
and have wastage of energy
and synchronization problems.

Issue of Chaitanya time zone
can be solved through DST
in India.

(2) Safer journeys at ^{school} bus etc

(3) Energy saving.

(4) Greater leisure time.

Since, North Eastern India
is quite above equator so
it can be successfully applied.

10. Explain the difference between chemical weathering and physical weathering. What is the ecological and economic significance of weathering?

रासायनिक अपक्षय और भौतिक अपक्षय के बीच अंतर की व्याख्या कीजिए। अपक्षय का पारिस्थितिक और आर्थिक महत्व क्या है?

Weathering - Weathering is an exogenic process which refers to disintegration and decomposition of rocks INSITU • operating force for weathering is sun's heat.

Types

- (1) chemical (2) Physical
(3) Biological.

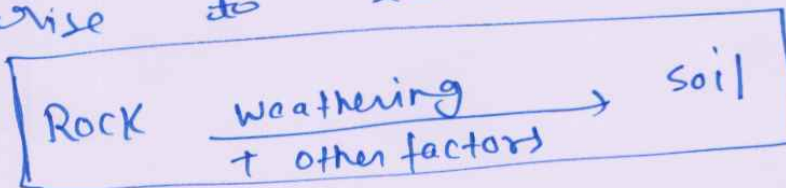
Chemical → It refers to the change in rocks due to chemical reactions such as carbonation, hydration, and oxidation etc

for eg Karst topography is due to chemical weathering

Physical weathering - Physical weathering is due to physical forces and results into outcomes such as exfoliations. It is due to pressure etc.

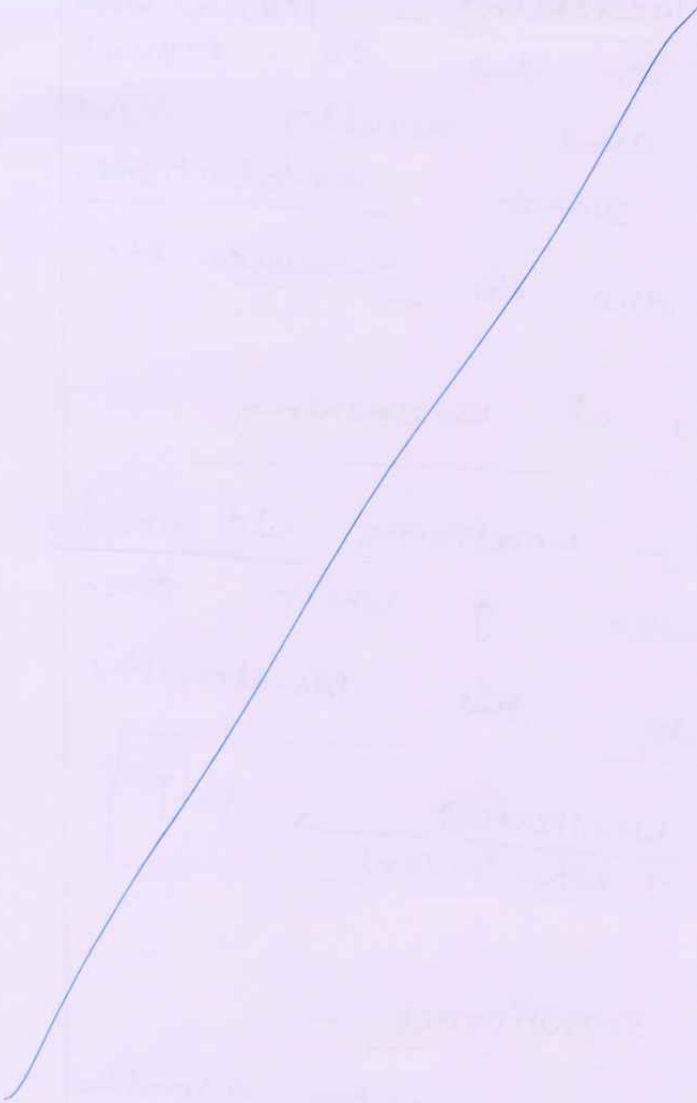
Significance of weathering

Ecological - weathering add minerals into rocks of which gives rise to the bio-diversity



Economic significance -

- (1) Growth of vegetation, agriculture and forest in soil
- (2) Lime stone, Karst topography etc



11. NDMA has recently decided to address urban flooding as a separate disaster, delinking it from floods. What is the difference between flooding and urban flooding? What measures need to be taken to mitigate and prevent urban floods?

एन.डी.एम.ए. ने हाल ही में शहरी बाढ़ की घटनाओं को बाढ़ से अलग करके पृथक आपदा के रूप में संबोधित करने का निर्णय लिया है। बाढ़ तथा शहरी बाढ़ में क्या अंतर है? शहरी बाढ़ को कम करने और रोकने के लिए कौन से उपाय किए जाने की आवश्यकता है।

Flooding - It is due to excess of water due to natural reasons such as excessive rain fall etc.

Urban flooding - It is due to design factors of cities, over population, poor drainage system etc. It is mainly due to natural factors and supplemented by the anthropogenic factors -

Reasons

(1) Concrete structure -

Structures in Urban areas
are made of concrete.
such as roads etc.
It make structure non-
permeable and non porous.
and prevents percolation
of water.

(2) poor drainage system -
either due to lack defects
in design or undercapacity.

(3) Due to lack blockage
of sewage lines.
NDMA has -
recently decided to
lift urban flooding

separate from flooding as
both disaster requires —
separate measures.

for eg — floods occurs
in Bihar due to change
of course of rivers. etc
prevention will require
construction of dams etc.

but urban flood —
prevention
/ mitigation will require —

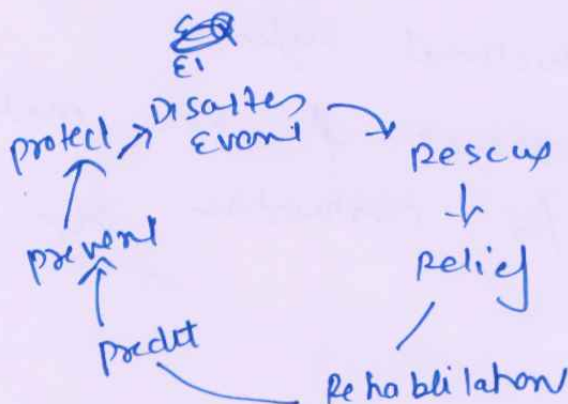
1. structural reforms
2. Research of new materials
for construction etc

12. An effective disaster plan should not only include 3R's - Rescue, Relief and Rehabilitation, but also 3P's - Predict, Prevent and Protect. Elaborate.

प्रभावी आपदा प्रबंधन योजना में केवल तीन आर - रेस्क्यू, रिलीफ और रिहैबिलिटेशन अर्थात् बचाव, राहत और पुनर्वास ही नहीं, बल्कि तीन पी- प्रेडिक्ट, प्रिवेंट और प्रोटेक्ट अर्थात् अनुमान, निवारण और संरक्षण भी सम्मिलित होने चाहिए। विस्तारपूर्वक बताइए।

Since disasters are the only catastrophic events, focus on rescue, relief and Rehabilitation had failed in past in saving lives and property including infrastructure.

Disaster continuum cycle



According to Disaster continuum -
cycle -

(1) Prediction of events is very -
important as necessary
measures can be taken timely

This is the reason that
Earth quakes are very -
dangerous as they can
not be predicted easily

(2) Prevention & protection - It means that
taking measures to -

Prevent disasters from occurring
or otherwise protecting
infra lines and resources.

However, even after
the prediction, prevention and
protection, of disaster -

occur, then →

(1) affected people must be -
rescued as fast as
possible" as
"Initial hours are the
golden hours in Disaster management".

(2) Role of communities become
very important in -
rehabilitation and rescue.

(3) medical facilities and -
relief measures must
be taken keeping in
mind the vulnerability
analysis:

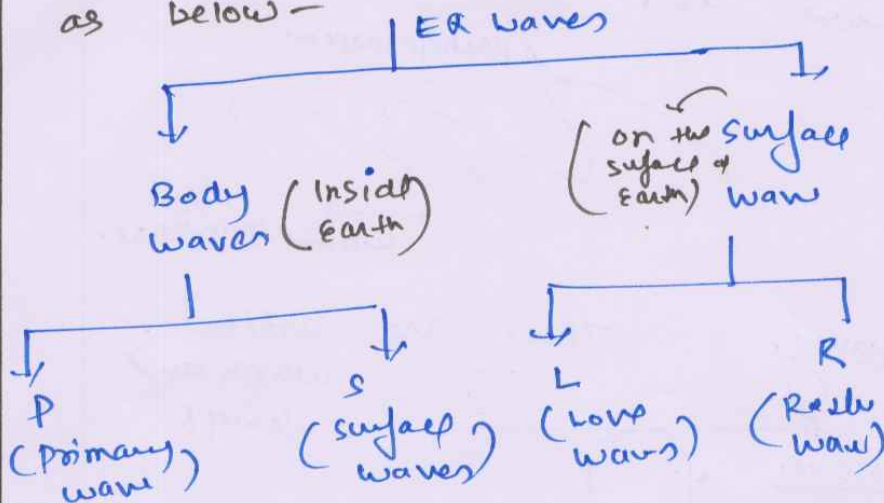
13. Explain the different types of earthquake waves and the concept of shadow zone. What inferences can we draw from shadow zones regarding the interior of the Earth?

विभिन्न प्रकार के भूकंपीय तरंगों और छाया क्षेत्र की अवधारणा की व्याख्या कीजिए। पृथ्वी के आंतरिक भाग के संबंध में छाया क्षेत्रों से हम क्या निष्कर्ष निकाल सकते हैं?

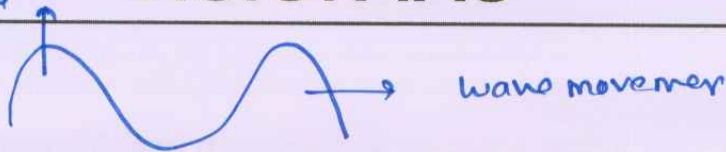
Energy from earthquakes is released in form of waves. (EA)

Foreshock — EA — Aftershock.

Earthquake waves can be classified as below —

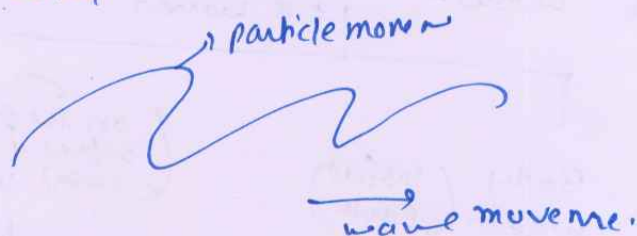


- 1) P waves → there are push-pull waves and like sound waves. There are fastest waves and first to reach surface.
- 2) S waves → There are shear waves.

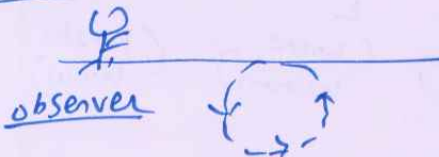
particle
motion

- Primary wave can travel in solid, liquid and gas but S waves can only travel in solids

L waves - These are snake like wave and most destructive

R waves

There are orbital waves and slow



Concept of shadow zone

Shadow zone of P waves is narrower than that of S waves.

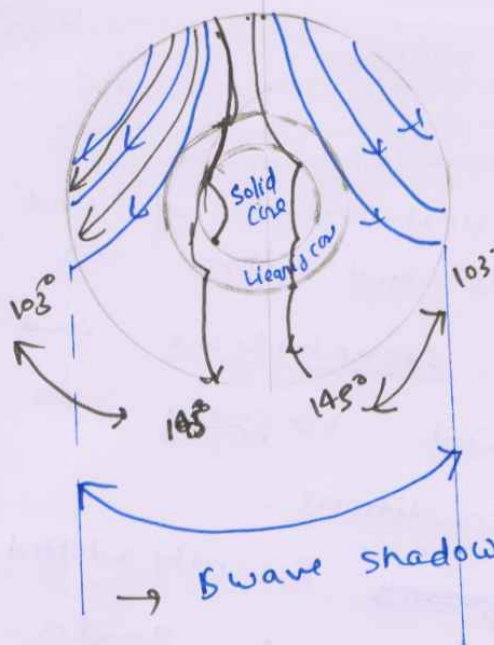


fig. 13.1

P wave shadow zone — $103^\circ - 140^\circ \text{N}$
 $103^\circ - 140^\circ \text{S}$

Inferences —

(1) since S waves can not pass through liquid so it can be inferred that outer core is

liquid
(2) velocity of P waves increased in inner core — hence inner core is solid

14. The recently declared Sustainable Development Goals have 'protecting life below the water' as one of its goals. In light of the above statement, illustrate the increased vulnerability of marine life due to climate change and suggest some measures to tackle the same.

हाल ही में घोषित किए गए सतत विकास लक्ष्यों में 'समुद्री जीवन का संरक्षण' भी एक लक्ष्य है। उपर्युक्त कथन के आलोक में, जलवायु परिवर्तन के कारण समुद्री जीवन की बढ़ती सुभेद्यता को सोदाहरण स्पष्ट कीजिए और इसका सामना करने के लिए कुछ उपायों का सुझाव दीजिए।

According to IUCN, most of the marine animals and flora is steno thermul, steno haline and has maintained isostasy in undisturbed conditions.

~~However~~ Recently adopted Sustainable development goals - gives emphasis on protection environment including marine one...

Climate change has significant threat to marine environment including flora & fauna by changing temperature,

Salinity and mineral composition.

ELNINO and marine environment -

(1) It brings the ~~hot~~ cold water on the surface of Indian ocean and warm water on Peru coast thus adversely affects coral health which are very susceptible to temperature ($25^{\circ} < T < 27^{\circ}$ for corals).

(2) climate change has also ~~of~~ adversely affected the upwelling phenomenon in oceans thus disturbed the transportation of minerals and oxygen to marine flora & fauna.

measures.

- (1) climate engineering solutions such
as artificial upwelling, and
- (2) carbon sequestration + ^{tree} Carbfix
~~pro~~ ject

Climate change has
increased CO_2 dissolution and
higher BOD & COD ~~level~~ ^{time},

(Biological and
chemical oxygen
demand)

made marine flora & fauna
more vulnerable.

15. Explain the phenomenon of Anticyclones. Why are they called weatherless phenomena?

प्रतिचक्रवात की परिघटना की व्याख्या कीजिए। उन्हें मौसम रहित परिघटना क्यों कहा जाता है?

Anticyclones - Anticyclones are the wind system with the high pressure system at the centre unlike Low pressure in cyclones.

For eg.

→ Tibetan Anticyclone during Indian monsoon

→ Siberian Anticyclone.

These Anticyclonic conditions can occur in - upper and lower Atmosphere both.

Unlike cyclones which brings huge variability in the weather conditions such

convectonal and frontal precipitation,
the Anticyclonic are called —
weatherless phenomenon because —

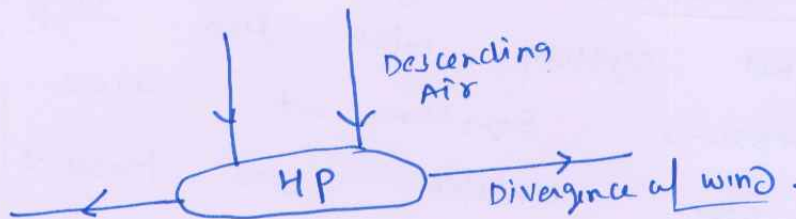


fig. 15.1 - Wind Divergence and
Descending air in the
Anticyclone

- Since Air ~~low~~ moves from High —
pressure to low pressure —
- it results into descending
air.
- while clouds are formed generally
due to ascending air.

Thus, without clouds
precipitation can not occur
and this results into

weather len phenomenon.



16. What is a heat wave? Discuss the health impacts of heat wave in India. Analyse the reasons behind high incidence of mortality rates due to heat wave in India. Suggest measures to tackle the above problem.

हीट वेव (ऊष्ण लहर) क्या है? भारत में हीट वेव के स्वास्थ्य संबंधी प्रभावों की चर्चा कीजिए। भारत में हीट वेव के कारण उच्च मृत्यु दर की घटना के पीछे विद्यमान कारणों का विश्लेषण कीजिए। उपर्युक्त समस्या का समाधान करने के उपाय सुझाइए।

Heat waves are the extreme hot weather conditions often related with humidity. IMD (Indian meteorological department) defines heat wave as rise in 5° temperature for more than 5 days. from temperature of last 40 years in same period.

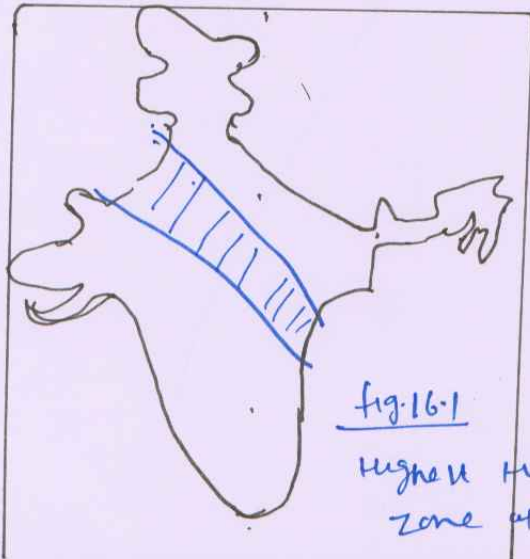


fig. 16.1

High heat prone
zone of India.

Reasons. Heat wave in India is often related with the anti cyclonic conditions which result into descending air, without rainfall, high heat (like Horse latitudes).

Impacts of heat wave

Health impacts

- (1) Brain stroke
- (2) Migrain related problem
- (3) irritation & itching
- (4) Dehydration
- (5) Dermatitis.

Some time in extreme case it results into death and cases of mortality due to heat wave are rising.

In India, impact gets aggravated and mortality is high due to low awareness, and weak primary health care. About two-thirds of the rural population works on agriculture fields which is more prone and vulnerable to heat wave shocks.

This problem can be effectively addressed by bringing awareness, effective alert system and ensuring continuous supply of electricity in all areas.

~~This is a~~ Heat wave problem is more serious in India as its impact not only human but also flora and biodiversity.

17. It has been observed that glacial loss in the Himalayas has accelerated over the last four decades. Discuss the causes and consequences of glacial retreat in the Himalayas.

ऐसा देखा गया है कि हिमालयी क्षेत्र में हिमनदों की क्षति पिछले चार दशकों से तीव्र होती चली गयी है। हिमालयी क्षेत्र में हिमनदों के पिघलने और पीछे हटने के कारणों और परिणामों पर चर्चा कीजिए।

According to satellite images of NASA and other researchers, it has been found that glacial loss in the Himalayas has accelerated over last 4 decades and rate is even increasing.

In 2012, NASA published an image Chora Bari glacier in Uttara Khand which later resulted in huge catastrophic event of cloud burst and flash floods.

part has been melting of glacier in replenished by snow fall ~~and to gain~~ ~~on the~~

but in present scenario, rainfall (snow) has decreased due to various factors such as El Niño and global warming.

Causes of glacial loss

(1) EL NIÑO - It has resulted into increase in temperature and decreased precipitation.

(2) Global warming - Due to various anthropogenic factors, global warming and temperature increase has resulted into melting of glaciers.

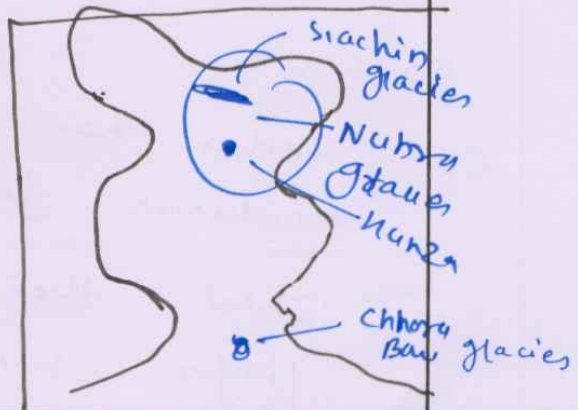
(3) Human encroachment and settlement - Various research, laboratories and telescopes have been -

Setup in Himalayan region —
which has increased energetic
radiation and resulting to
melting of glacier.

for eg. India has recently
setup and ARIES telescope
and high altitude research
centre.

Consequences of glacial retreat

- (1) floods and flash flood as
in Uttarakhand.
- (2) Loss of Biodiversity.
for eg. severe threat to
snow leopard etc
- (3) Increased Land slides



18. Forest fire pose a threat not only to the forest wealth but also to the entire regime of flora and fauna. What are the causes of forest fire? Discuss the ecological, economic and social impacts of forest fires.

वन की आग न केवल वन सम्पत्ति बल्कि क्षेत्र की संपूर्ण वनस्पतियों और जीवों के लिए भी खतरा प्रस्तुत करती है। वनों में आग लगने के कारण क्या हैं? वन में आग लगने के पारिस्थितिक, आर्थिक और सामाजिक प्रभावों पर चर्चा कीजिए।

Forest fire events ~~in India~~
are due to various natural
and anthropogenic factors.
Recently ~~in~~ Uttarakhand and
Jharkhand Pradesh 2016 forest
fires witnessed huge loss to
biodiversity. • Forest survey
of India is responsible for
assessment of forest fire in
India.

Causes

- (1) India has huge belt of
deciduous forests which
shed their leaves -
before summer. This

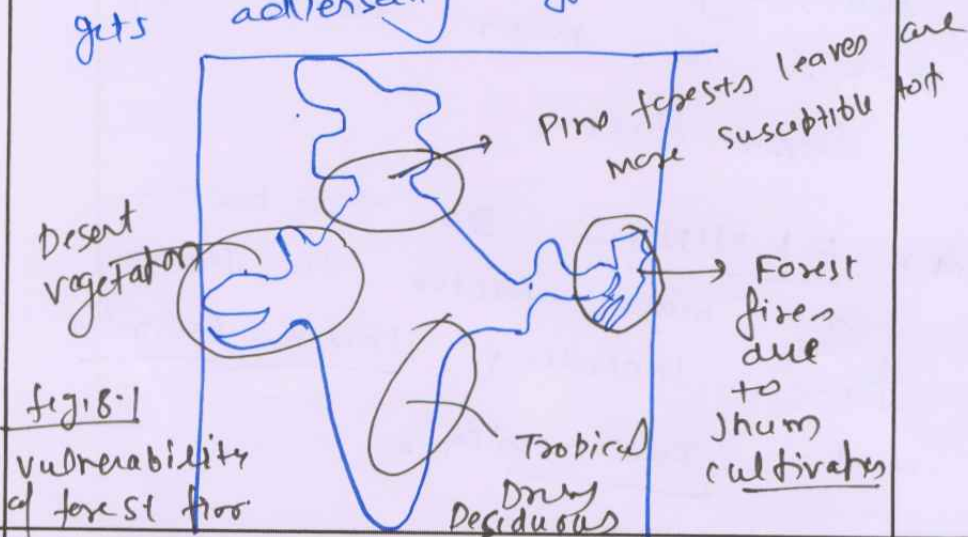
act as fuel for forest fires -

(2) India people clear the forest surface in order to get collect forest produce such as fruits and flowers etc. there can be easily collected in clear surfaces.

(3) Jhum Cultivation - Jhum cultivation is practised intensively in North-eastern region is major cause of forest fires.

(4) EL NINO - It has been a major factor in forest fires including India, Australia and Indonesia.

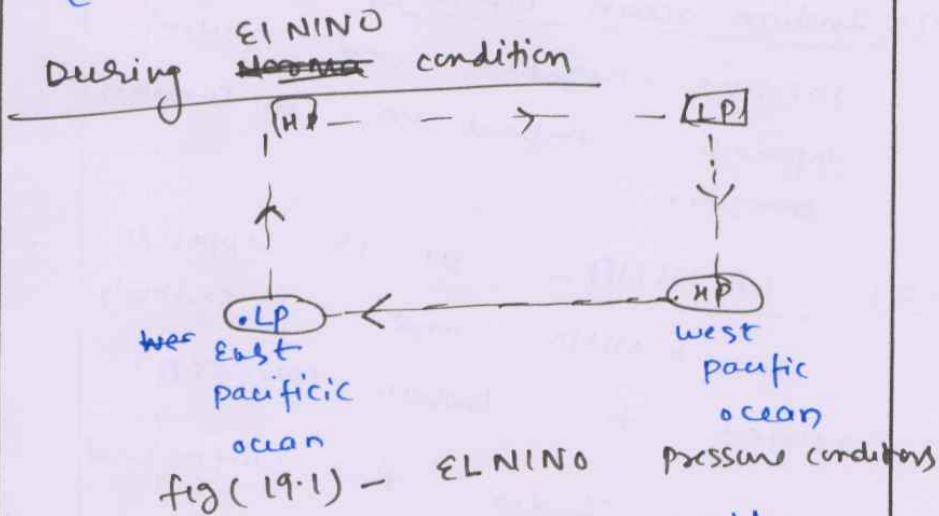
- Biologically ~~signi~~ forest first devastate wealth of the valuable flora and fauna and irreparable loss to biodiversity and even extinction of some endemic species. Soil erosion, water recycling also gets affected.
- Economical impact.
 - Loss of timber, fruit resources
 - Loss of Bio fuel
- Many communities (especially tribal) are completely dependent on forest produce and their welfare gets adversely affected.



19. It is said that there is a strong correlation between El Nino event and a poor monsoon. Elucidate. Do you agree that recent events of extreme weather conditions is a result of El Nino? Give reasons.

यह कहा जाता है कि अलनीनो परिघटना और कमजोर मानसून के बीच मजबूत सहसंबंध है। इसे स्पष्ट कीजिए। क्या आप इससे सहमत हैं कि हाल ही की मौसमी दशाओं संबंधी चरम घटनाएँ अलनीनो का परिणाम हैं? कारण बताइए।

El nino refers to the appearance of warm water and low pressure in east pacific ocean (peru coast) and cold water and High - pressure in ~~east~~^{west} pacific ocean. (Indian ocean side).



- During El nino west pacific ocean ocean become cold and it results into descending air

which causes decreased precipitation in Indian ocean region. These are called teleconnections and ELNINO is negatively related to the Indian monsoon.

However ELNINO is not the ~~at~~ single teleconnection factor which affects Indian monsoon.

(1) Indian ocean Dipole → it has positive - negative and neutral unperiodic impact on Indian monsoon.

(2) LA NINA - it is opposite to ELNINO and it positively related to Indian monsoon.

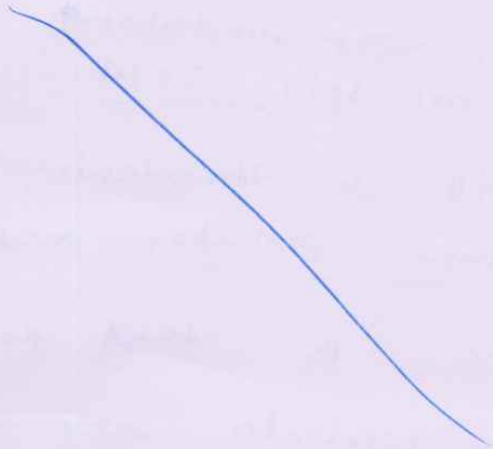
India has witnessed very low rainfall since 2013 and according to (IMD) Indian meteorological department

reason is ~~El Niño~~ ELNINO.

- It also results in forest fires etc

- It is related with the extreme droughts in India.

waning of El Niño in 2016 has given new hope to monsoon and Indian Agriculture as IMD has predicted above normal rainfall.



20. "Rising accidents involving merchant ships leading to oil spills in Indian waters is a growing concern that needs to be addressed." Discuss the impact of oil spills on marine environment. Also, suggest measures to prevent such disasters.

"व्यवसायी जहाज संबंधी दुर्घटनाओं के निरंतर बढ़ने के कारण भारतीय जल क्षेत्र में तेल रिसाव एक बढ़ती चिंता का विषय है, जिसका समाधान करने की आवश्यकता है।" समुद्री पर्यावरण पर तेल रिसाव के प्रभावों की चर्चा कीजिए। साथ ही, इस प्रकार की आपदाओं का निवारण करने हेतु उपायों का सुझाव दीजिए।

~~oil spill~~ According to IMO (Inter-national maritime organisation),
case of oil spills are increasing.
Indian ocean has also —
witness many oil spills. Growing
concern is that it even
"inland waterways" has also —
witnessed oil spill.

for e.g. ~~oil~~ Sunderbans
oil spill - 2014

oil spill is threatening
source of marine pollution and
worrying fact is that these
oil and petrochemicals are
non biodegradable.

Impact

(1) Impact on flora - marine water
Supports numerous phytoplankton
which are helps in carbon
sequestration gets adversely -
affected.

(2) Impact on fauna - many fishes
whale, shark ~~etc~~ and marine
animals such as Dugong gets
adversely negatively impacted.
oil spills even caused
to to extinction of some -
species.

(3) Impact on coral health -
coral is very susceptible to
marine pollution. According to
NASA satellite images, coral
area has declined in the
zones of oil spills.

Measures -

major cause of oil ~~acc~~ spill is
ship accident either due to collision
or otherwise.

- (1) Ship traffic controller systems should
~~work on~~ be designed and
operated in more effective way
- (2) Decongestion of marine Traffic.
- (3) Bio Remediation → Phyto Remediation

During Mumbai oil spill in Arabian
Sea, professor Anand Mohan Chakr.
Borly designed an Superbug -
psuedomonas putida which -
effectively ~~sub~~ depolluted the
marine water.