

**GENERAL STUDIES (TEST CODE : 1986)**

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Medium Eng./Hindi	English	Registration Number	1018150
Center		Date	29/12/21

INDEX TABLE			INSTRUCTIONS
Q. No.	Maximum Marks	Marks Obtained	
1	10		1. Do furnish the appropriate details in the answer sheet (viz. Name, Registration Number and Test Code). उत्तर पुस्तिका में सूचनाएं करना आवश्यक है (नाम, प्रश्न-पत्र कोड, विद्यापीठ आदि)। 2. There are TWENTY questions printed in ENGLISH & HINDI इरामे 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 आपकी प्रवेश पत्र में किया गया है और उस माध्यम का स्पष्ट उल्लेख प्रश्न-सह-उत्तर (क्यूसीए) पुस्तिका के मुख पृष्ठ पर अंकित निर्दिष्ट स्थान पर किया जाना चाहिए। उल्लिखित माध्यम के अतिरिक्त अन्य किसी माध्यम में लिखे गए उत्तर पर कोई अंक नहीं मिलेगा। 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 उसकी अंश को स्पष्ट रूप से काटा जाना चाहिए।
2	10		
3	10		
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19	15		
20	15		
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.

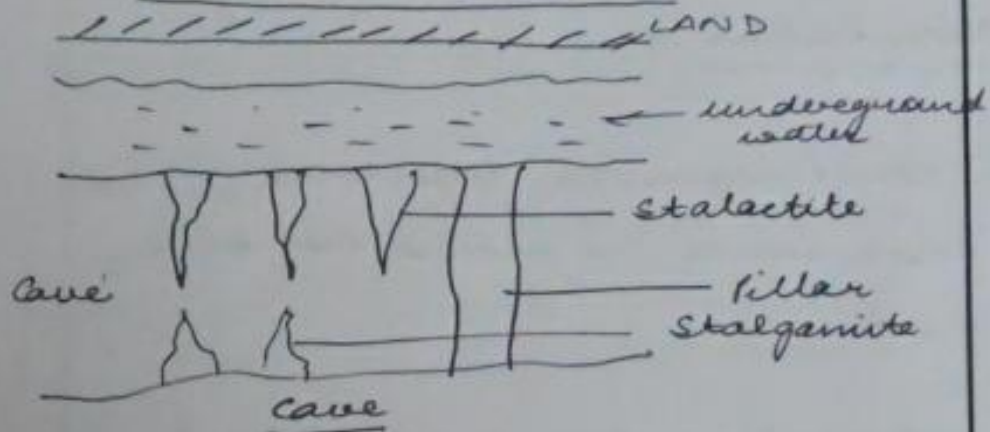
4.

5.

6.

1. Highlighting the conditions that are conducive for the formation of Karst topography, discuss its distribution around the world. (150 words) 10
- कार्स्ट स्वरूप के निर्माण के लिए अनुकूल स्थितियों को रेखांकित करते हुए, सम्पूर्ण विश्व में इसके वितरण की विवेचना कीजिए।

Karst topography is developed as a consequence of groundwater erosion in limestone such areas.



Swiss Holes



Uvalas

Conditions conducive for Karst

→ Dolomite and limestone
containing overlying strata

→ Running groundwater / sea-water for corrosion

→ Availability of hollow caves underneath for stalactite formation

Distribution : ⇒

- ① Karst region in Yugoslavia
from where the name has been given
- ② South East Asia & South Asia
 - ↳ Thailand, Malaysia, Indonesia
 - ↳ Vietnam has some of the most iconic caves in Halong Bay

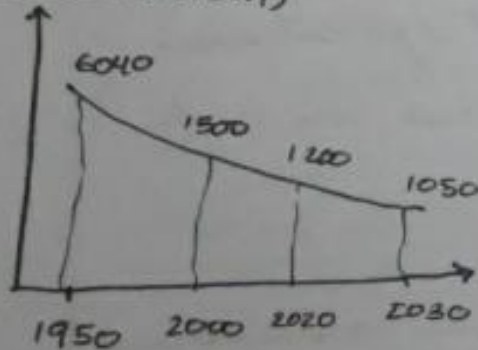
Thus, Karst topography is found across the world with conducive conditions in limestone rich areas.

2. The extraction of groundwater in India has reached a level that is threatening the water security in the country. Analyse the guidelines issued by the Central Ground Water Authority in this regard. (150 words) 10

भारत में भूमिजल का निष्कर्षण एक ऐसे स्तर पर पहुंच गया है, जो देश में जल सुरक्षा के समक्ष खतरा उत्पन्न कर रहा है। इस संबंध में केंद्रीय भूमि जल प्राधिकरण द्वारा जारी किए गए दिशा-निर्देशों का विश्लेषण कीजिए।

India has just 4% of the water resources in the world but it contributes more than 25% of Groundwater (GW) usage.

Per capita supply
demand (bcm)



As per NITI's
CWMI 2.0, by
2050 demand
will be outstripped
by supply by
2X causing
6% decline in
GDP

≡≡≡ Low Risk/Stress

xxx High Stress

≡≡≡ Moderate Stress

In this regard Central Ground
water Authority has issued
guidelines for wise-use

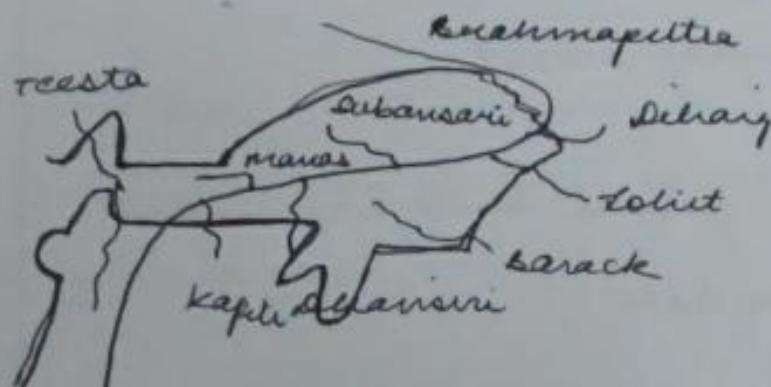
- Entire area of country divided into zones basis water risk
- Withdrawal caps and operational limitations on industries in high risk areas
- Continuous water-table monitoring in these areas
- Refusal or award for licensing in water guzzling enterprises
- Provision to ration use below critical threshold.

Thus, these guidelines are an important beginning but need a 'Jai Andolan' to secure our water future by 2030.

3. Discuss the challenges that lie in harnessing the potential of hydroelectricity in North-East India. (150 words) 10

पूर्वोत्तर भारत में जलविद्युत की संभावना का दोहन करने में आने वाली चुनौतियों की विवेचना कीजिए।

The North East has rich hydro-
electricity potential with rivers
like Brahmaputra, Karack & Teesta.



Rivers in the North East

Challenges

① No river sharing agreement
with China

↳ Issues with dam construction
on Tsangpo

② River sharing complications
as Bangladesh is lower riparian
state

- ③ Narrow valley basin and non-conductive plain topography which can lead to inundation
- ④ Highly seismic area poses dam safety threat
- ⑤ Challenges in land acquisition from tribals
↳ A lot of tribal land is communally owned
- ⑥ Environment concerns of dam ageing and tribal displacement
↳ North-East has 20% of total tribal population

4. In light of various recent studies, discuss how climate change is affecting the jet streams. (150 words) 10

हाल के विभिन्न अध्ययनों के आलोक में, क्यों बीजिए कि जलवायु परिवर्तन कैसे जेट धाराओं को प्रभावित कर रहा है।

Jet streams are narrow
circumpolar bands of upper
tropospheric geostrophic winds.

They flow from west to east in
 a meandering pattern forming
wavy waves.

Climate change impact

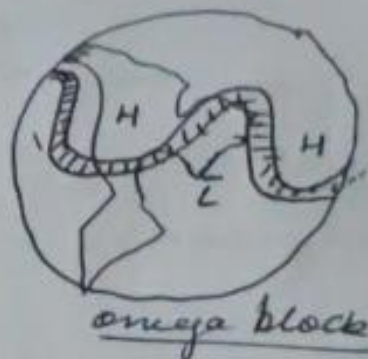
→ Increasing global temperature
 are affecting the pressure system

→ Increased instances of low
 temperature gradient among
 polar and sub-tropical regions

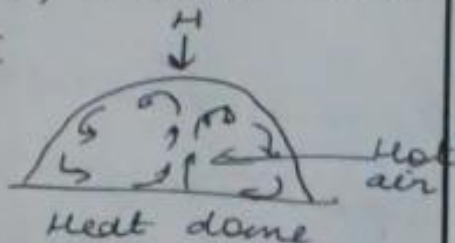
→ causes larger omega blocks

→ Omega blocks can move in downwards bringing fierce polar vortex as happened in Texas in Jan 2020

→ It can also form high pressure conditions over



hot areas forming consecutive heat domes as happened in Lytle in British Columbia, Canada where temp. reached 50°C



IPCC's Assessment

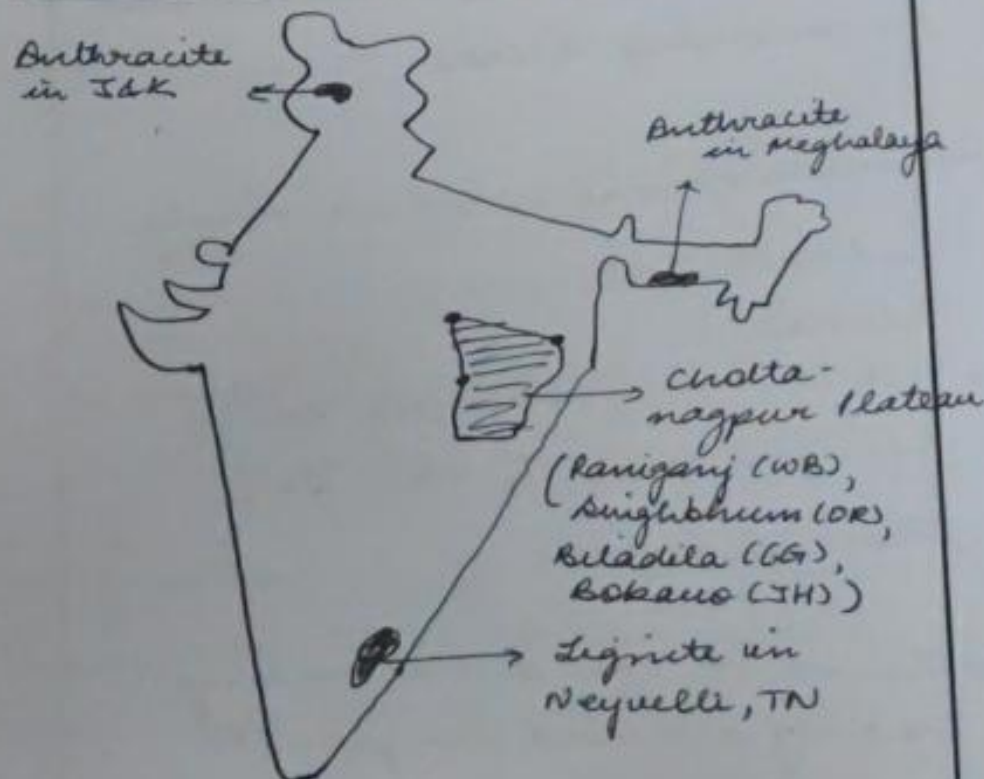
Report 6 predicts increased extreme weather changes due to impact on jet streams.

5. Highlighting the distribution of coal in India, discuss the issues associated with coal mining. (150 words) 10

भारत में कोयले के वितरण को रेखांकित करते हुए, कोयला खनन से जुड़े मुद्दों की विवेचना कीजिए।

In India coal is found in mostly Bituminous form with regional availability of lignite and anthracite. Rest is mostly peat (low-quality)

Also non-coking > coking coal



Coal in India

Issues with coal mining

- Environmental concerns
(As ash content of Indian coal is high)
- Import dependence post
coalgate scam and restrictions
on awarding blocks
- Uneconomical rat-hole mining
in North-East
Potential
- Risk to energy security as
coal dependence is 55% for
power generation
- Limits to Coal India's mining
capacity and need for private
investment.

Thus, coal presents important environmental and energy concerns requiring immediate attention.

6. Assess the efforts India has taken towards achieving the goals of the Strategic Plan for Biodiversity (2011-2020). (150 words) 10

जैव विविधता के लिए रणनीतिक योजना (2011-2020) के लक्ष्यों को प्राप्त करने की दिशा में भारत द्वारा किए गए प्रयासों का मूल्यांकन कीजिए।

India adopted Strategic Plan
for Biodiversity (2011-2020)

for fulfillment of Aichi
Biodiversity Targets (19 targets
in total)

Efforts

→ Ecosystem Restoration

* CAMPA → afforestation

* Nagan Van Yojana

* Green India Mission

→ Conservation of ecosystem

through expanded Ramsar sites,
Biodiversity Reserves, wildlife
sanctuaries

→ PPVFR Act to safeguard breeder
and farmer rights

→ Addressing man-animal conflicts and better wildlife conservation outcomes

↳ Fastest tiger population growth (2500 in 2020 from 1400 in 2014)

→ Efforts at reversing land degradation and mangrove deterioration

→ Increase in ^{& tree cover} forest area to 24.5% in 2019

However, as per Aichi assessment report all countries have failed in meeting original Aichi

targets and more needs to

be done to conserve our biodiversity

7. Explain the concept of Ecosystem Restoration. What are the challenges and opportunities associated with this concept? (150 words) 10

पारिस्थितिक तंत्र पुनर्स्थापन की अवधारणा की व्याख्या कीजिए। इस अवधारणा में जुड़ी चुनौतियाँ और अवसर क्या हैं?

Ecosystem Restoration is a gamut of conservation and restorative activities aimed at reversing the ecological services and economic potential of degraded ecosystems.

Challenges : →

- ① Time taking → Nature builds green cons while man destroys in centuries
- ② Capital intensive technology
↳ Soil washing is cost prohibitive
- ③ Not-foolproof → Extremely tricky to regrow mangroves by transplantation
- ④ Multi facious → Need to factor in ecological niche and services of all constituents of the community

⑤ Development vs sustainability dilemma especially for the global south.

Opportunities

- ① New breakthroughs → Miyawaki technique has shown tremendous promise in effective afforestation.
- ② Enhanced public awareness
↳ Enddays For Future
- ③ Paradigm change → from mitigation to climate adaptation.
- ④ COP-26 and promise for enhanced climate finance.

UN has declared 2020-30 as the decade of ecosystem restoration and we must capitalize on these opportunities to overcome these challenges.

8. Give an account of the challenges associated with rapidly increasing biomedical waste in India. Also, state the key features of the Bio-medical Waste Management (Amendment) Rules, 2018. (150 words) 10

भारत में तीव्रता से बढ़ रहे जैव-चिकित्सा अपशिष्ट से जुड़ी चुनौतियों का विवरण दीजिए। साथ ही, जैव-चिकित्सा अपशिष्ट प्रबंधन (संशोधन) नियम, 2018 की प्रमुख विशेषताओं का भी उल्लेख कीजिए।

Biomedical waste comprises of the discarded medical waste like syringe, mask, PPE kit, blood.

Challenges

- ① Increasing volume due to COVID-19
↳ mask, shield, PPE kits
- ② Limited and environment polluting incineration technology
- ③ Increase threat of Anti-Microbial Resistance (AMR) due to contact with bio medical waste
- ④ Health hazard due to poor waste collection
- ⑤ Faulty implementation of Bio waste Rules 2018 right

⑥ Further risk of outbreaks
during pandemic era and
risk of new zoonotic diseases
due to poorly discarded waste

Biowaste Management Rules 2018

- Process for collection and segregation
- Guidelines on autoclaving syringes and medical equipment
- Frontline health worker PPE and mask disposal guidelines
- Procedure for incineration of waste and its reporting
- Guidelines for community workers collecting and handling biomedical waste.

The guidelines need to be married with strong on ground infrastructure & implementation for ensuring safe disposal

9. Discuss the role played by local bodies in various phases of disaster management. (150 words) 10

आपदा प्रबंधन के विभिन्न चरणों में स्थानीय निकायों द्वारा निभाई जाने वाली भूमिका पर चर्चा कीजिए।

Local bodies are the third tier of our governance which is closest to the people.

Eg → Panchayat, Municipalities, district development office

The Disaster Management Act, 2005

encourages an active role for local bodies in various phases of disaster management.

* Hazard mapping and vulnerability assessment → Local panchayats assist with identification and enumeration of at risk population

* Disaster Preparedness → use of local population in creating structural assets like check dams, shelters and water-fitting through MNRGA

* Early warning → Mock drills and use of local bodies in ensuring evacuation prior to cyclones

* Response → First line of defence post disaster during "golden hour"³¹

* Rehabilitation → Rebuilding back better through community participation

* Resilience → Against future disaster

Challenges → Lack of adequate funding & financial devolution

Way Ahead → Covid-19 has shown played by local bodies especially in Kerala and Odisha. There is strong need to bolster their technical and financial wherewithal.

10. What do you understand by impact based forecasting in disaster management? How can such forecasting strengthen the disaster management preparedness?
(150 words) 10

आपदा प्रबंधन में प्रभाव आधारित पूर्वानुमान से आप क्या समझते हैं? ऐसा पूर्वानुमान आपदा प्रबंधन की तैयारियों को कैसे मजबूत कर सकता है?

Impact based forecasting takes into account the economic cost of material & non-material damage as well as the potential impact of a disaster on vulnerable sections in an area.

It uses advanced mathematical models to account for impact in the form of ^① Loss of houses, ^② destruction of public property, ^③ casualty toll and ^④ infra resources.

It employs vulnerability mapping (old, disabled, children) and uses past data to assign weights to probability of disaster risk and consequent impact.

Advantages :-

- Helps understanding which critical infra are likely to be delinked → alternate arrangements can be made
- Gives ready insights for reducing casualties → rehabilitation/resettlement of high risk population
- Economic indices are more compelling in understanding loss to life & prosperity
 - ↳ Better governance response
- Improves decision making

Thus, impact based forecasting is an important tool in decision making for disaster preparedness.

11. Plate tectonics, which is a unifying theory combining the continental drift and seafloor spreading theories, explains many features and processes that we find on the Earth. Discuss. (250 words) 15

प्लेट विवर्तनिकी, जो महाद्वीपीय प्रवाह और सागरीय तल विस्तार के सिद्धांतों के संयोजन का एक एकीकृत सिद्धांत है, कई अभिलक्षणों और प्रक्रियाओं को स्पष्ट करता है जिन्हें हम पृथ्वी पर पाते हैं। चर्चा कीजिए।

The Plate tectonics theory was a fraternal position and further improvement on the continental drift and seafloor spreading theory.

Its key sea floor spread theory by Haz & Dietz, mid oceanic ridges and undersea volcanism were explained.

A Wegener's Continental Drift had hypothesized the current landforms as a consequence of divergence and splitting from an ancient super-continent called Pangea.

Key concepts of Plate tectonics

- * Landmass exists in the form of oceanic and continental plates floating on heavier asthenosphere
- * Asthenosphere and upper mantle being of silicic origin has denser mass
- * Ocean floor ^{plates} → basaltic origin
(lighter than mantle, heavier than land)
- * Continental ^{plates} → Andesitic to granitic origin (lightest of all)
- * All landforms consequence of plate interactions

Explains various features

- Mid-Oceanic Ridge (Ocean-Ocean divergence)
 & Left Valley plates
- Faults (Continental divergence)
- Island Arcs like Japan & Philippines
 Ocean plate
(Ocean-~~continent~~ convergence)
- Volcanic Mountains → Andes
(Ocean-Continent plate convergence)
- Fold Mountains → Himalayas
(Continent-Continent convergence)

Explains various process

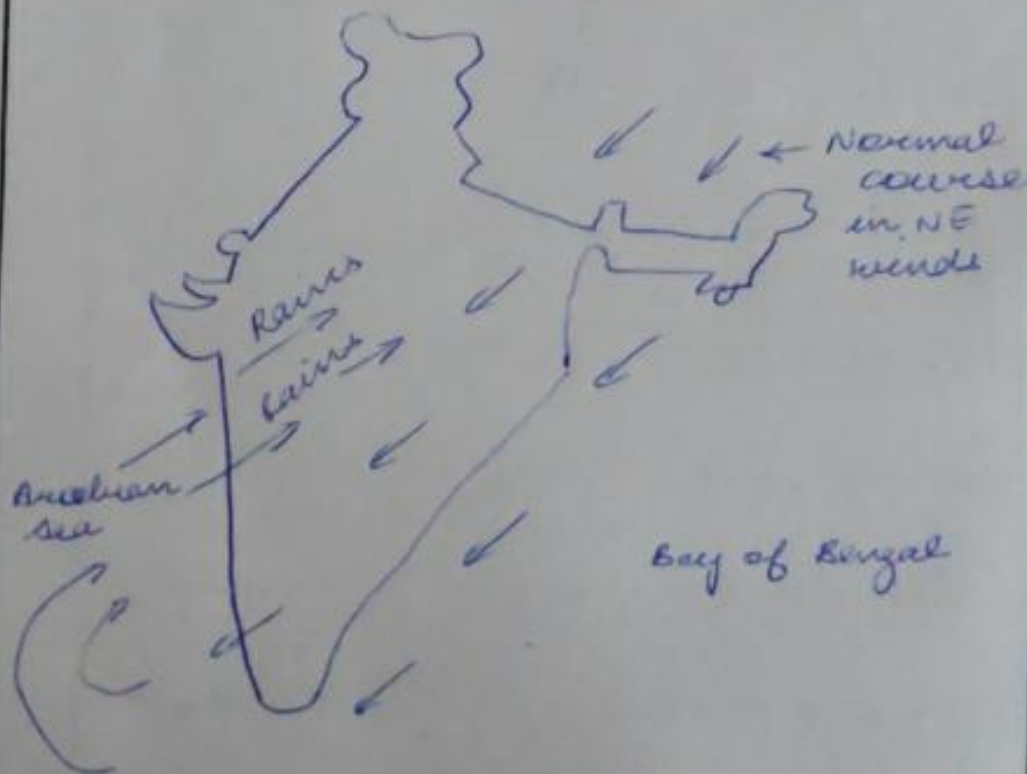
- Volcanism (Basaltic & Andesitic)
- Earthquakes (Energy release via plate movement)
- Tsunamis (Undersea Earthquakes)

Thus, plate tectonics is a unifying theory.

12. The pattern of the Indian monsoon has been witnessing changes in recent decades. Examine in the light of recent studies linking this phenomenon to climate change. (250 words) 15

भारतीय मानसून के प्रतिरूप में हाल के दशकों में परिवर्तन देखा गया है। इस परिघटना का, जलवायु परिवर्तन से इसे सम्बद्ध करने वाले हानिया अध्ययनों के आलोक में परीक्षण कीजिए।

Indian monsoon is a unique
phenomena characterised by
seasonal reversal of winds which
reshapes much of rainfall in
South East Asia.



Seasonal reversal for SW Monsoon

Off late there are wide vagaries
in recent decades :->

- Delayed rains or early rains
- Higher than usual precipitation
- Drought and draught in many years
- Changing pattern

Research has shown impact of
climate change on the vagaries

* IPCC AR4 and AR5 have
predicted increased instances
of marine heatwaves due to
rising temp (global warming)

* This has been linked to delayed
low-pressure conditions on Tibetan
Plateau impacting onset of rains

* Higher warming also leads to increased extreme events of floods (in Mumbai 2006) and drought due to change in El-Nino and La-Nina frequencies

Indian
* Forest Report 2017 has acknowledged 50% increase in forest fire risk due to El Nino variation

* There are adverse impacts on Sub-Tropical Westerly Jet and Tropical Easterly Jet which forms the backbone of monsoons

* AR6 (IPCC) has said 1.5°C increase is now inevitable and South East Asia is most impacted from climate inconsistencies

As 55% of our net sown area is rainfed, climate change poses great risks for our food security.

13. Highlight the reasons behind high concentration of plantations in South India. Also, give an account of the significance and challenges that the plantation sector of South India is confronted with. (250 words) 15

दक्षिण भारत में बागानों के उच्च संकेन्द्रण के लिए उत्तरदायी कारणों पर प्रकाश डालिए। साथ ही, दक्षिण भारत के बागान क्षेत्रों के महत्व और उनके समक्ष व्याप्त चुनौतियों का भी विवरण दीजिए।

Plantations are large industrial agricultural ecosystems specialising in monoculture of a particular crop. eg → Rubber, Tea, Coffee.

Concentration in South India

→ Tropical weather

* Suitable climate (Rain + Sun)

↳ Kerala's tropical climate is suitable for rubber

↳ Baba Budan hills receive right amount of rain and altitude for coffee

↳ sloping valleys provide conducive environment for tea

* Availability of electricity required for processing through hydropower
→ Idukki, Mularperiyar

- * cheap skilled labour (especially women) for plantations
- * well-connected transport network (higher development in south) → conducive for exports
- * Historically → started by British.
No industrial inertia exists
- * Availability of credit at competitive rate

SIGNIFICANCE

- ① Boosts agri-exports earning much needed FDI (India → net exporter)
- ② Higher income for rural households
- ③ Women empowerment → employed in huge numbers
- ④ Boost to services and downstream sectors → Cafe Coffee Day, Starbucks

CHALLENGES

- ① Issues in land acquisition (as needs large landholding)
- ② Forest clearance (especially in Nilgiris → Biodiversity hotspot) is a sensitive issue (Environment Min v/s Local Govt → Gadgil + Kasturirangan Committee) (ESA)
- ③ Environmental challenges emanating from monoculture and deforestation
- ④ Default risk as capital intensive

Thus, there is need to harmonize the economic potential with environmental challenges to prevent our South from turning into Borneo (Indonesia).

14. What do you mean by industrial inertia? Bring out the factors that contribute to industrial inertia and also give a few examples from the Indian context. (250 words) 15

औद्योगिक जड़त्व से क्या समझते हैं? औद्योगिक जड़त्व में योगदान देने वाले कारकों को स्पष्ट कीजिए और साथ ही भारतीय संदर्भ से कुछ उदाहरण भी दीजिए।

Industrial inertia refers to the phenomena whereby a company/industry continues to operate in the same geographical location despite that location losing strategic advantage due to host of reasons.

Factors contributing to industrial inertia

- ① Threat of substitute is not high enough to completely reduce advantage
- ② High cost of translocation

③ Ability to make profit
(albeit reduced) with minor
modifications and tech change

④ Cultural factors

↳ Lack of initiative

↳ Lack of alternate source of
livelihood

↳ It has become part of material
culture / rituals

⑤ Government support / subsidies
due to political contingencies

⑥ Lack of education / skilling

Examples

→ Continuance of jute farming
at large scale even when cheaper
alternatives have revolutionized
packaging material industry

↳ Dependent on JPM Act

→ Growing sugarcane in north which is water-guzzler in a non-favourable climate vis-a-vis south.

↳ Historical reasons

↓

Indigo substituted by British

↳ FRP line keeps intact

→ Location of iron & steel industry closer to tribal areas despite ports and new tech.

15. What are rare earth elements? Highlighting their industrial applications, give an account of their distribution across the world. (250 words) 15

दुर्लभ मृदा तत्व क्या हैं? उनके औद्योगिक अनुप्रयोगों की रेखांकित करते हुए, विश्व भर में उनके वितरण का विवरण दीजिए।

Rare Earth elements are scarce
mineral resources with valuable
industrial applications.

eg → Lithium, Zirconium,
molybdenum

Industrial Applications

→ Semi-conductor industry
uses lithium

→ Energy sector for lithium
ion batteries + Automobiles
(Electric car)

→ Defence for high grade steel
via molybdenum

→ Aviation for zirconium for

high grade outer frame
→ lithium weavers in solare industry
→ Missile technology → for
zirconium + molybdenum

distribution in world

By definition rare earth
materials are rather limited
in sources.

→ Lithium is found in
Argentina, Bolivia and Chile
which account for >90%
production

→ Zirconium and Molybdenum
are found in Australia, Ural
mountains in Russia, Ukraine
and Kazakhstan + Congo.

This poses a challenge for any country as both of next-generation tech and renewable energy tech is dependent on them.

Way Ahead → India has formed KABIL (For Kaaniy i.e. minerals in scarce elements) to secure these.

The current supply chain crisis has shown the geopolitical contours and importance of rare earth elements.

16. Identify the causes behind the prevalence of various forms of human-wildlife conflicts in India. Also mention the steps taken by the government to prevent these, with emphasis on the "Landscape Approach to address Human-Elephant Conflicts". (250 words) 15

भारत में मानव-वन्यजीव संघर्षों के विभिन्न रूपों की व्यापकता के लिए उत्तरदायी कारणों की पहचान की जाए। "मानव-हाथी संघर्षों को दूर करने के लिए भूदृश्य दृष्टिकोण" पर बल देते हुए, इन्हें रोकने के लिए सरकार द्वारा उठाए गए कदमों का भी उल्लेख की जाए।

Human wildlife conflicts

are defined as attack on the material and non-material human well being by wild animals.

eg →

- ↳ man-eater tigers
- ↳ Destruction of crops by herd of elephants

CAUSES

- ① Deforestation → Reducing area for animals
- ② Overpopulation → Putting stress on areas adjoining forests

- ③ Lack of infra To safeguard intrusion in human settlements
- ④ Lack of skilled forest managers
- ⑤ Politicization of rights of forest dwellers
- ⑥ Use of forest produce to graze cattle
- ⑦ Lack of alternate infrastructure for animals
- ⑧ Overurbanization is leading to fragmentation of contiguous wildlife areas
↳ Bandipore - Nagarhole - Madumalai
- ⑨ Poor implementation of environment and wildlife protection laws

Indian government has taken a landscape-approach to address

this issue especially with elephants: ⇒

- ① Project Rehab → Use of bee-boxes to guide elephants from not intruding in human settlement
- ② Elephant corridors to provide natural passageway addressing fragmentation issue
- ③ Eco-bridges and eco overpasses
↳ Traffic goes underneath without disturbing wildlife
- ④ Green eco-culverts → facilitates bypassing highways → animals go underneath ROB and overlying flyover
- ⑤ ESA → to act as a buffer thus new green innovations can go a long way in resolving man-animal conflict

India's vulnerability to flash floods and suggest measures for better resilience to flash floods. In this context, also briefly highlight the significance of recently launched Flash Flood Guidance System (FFGS) operated by the Indian Meteorological Department (IMD). (250 words) 15

आकस्मिक बाढ़ के प्रति भारत की सुभेद्यता का आकलन कीजिए और इसके प्रति बेहतर लचीलेपन के उपायों का सुझाव दीजिए। इस संदर्भ में, हाल ही में आरंभ की गयी तथा भारत मौसम विज्ञान विभाग (IMD) द्वारा संचालित आकस्मिक बाढ़ मार्गदर्शन प्रणाली (FFGS) के महत्व पर भी प्रकाश डालिए।

Flash floods refers to a sudden surge of water which inundates a habitation on a very short notice ^(in span of hours) compared to traditional floods (which may take days)

vulnerability to flash floods

→ Riparian population living downstream of major hydel projects especially in Uttarakhand
↳ Tehri Garhwal dam

→ glacial lake outbursts →
(i) high risk in Uttarakhand (Gangotri, Yamunotri) → Pistiganga episode
(ii) Himalayan Foothills

- Aging dams → heavy siltation reduces water carrying capacity
 - ↳ Kerala floods in Munnar 2018
 - ↳ > 45% dams in India at risk
- Urban sprawls in heavy rain areas (Chennai, Mumbai)
 - ↳ Poor drainage → rain water can't recede
- Risk of flash floods from storm surge in coastal areas (more on East Coast)

Measures for resilience

- Real time water level monitoring in high risk areas
- Better drainage infra in urban cities
- Checking construction in low lying areas across coast
- Disaster Mgmt drills and early warning systems in high risk areas

- Improved geographical tech and international collaboration for better and faster data
- monitoring of all glacial lakes
↳ preparation of real time glacial atlas through remote sensing
- structural measures like flood plain zoning, river bank afforestation, slope reinforcement (reinforced catch walls and stone crates)

In this regard INDIA FFGS is designed to aid the real time monitoring by checking water levels, comparison with past data and use of mathematical models aimed at better prediction.

18. Marine litter is not just an environmental issue but poses a socio-economic challenge as well. Discuss. Also, enumerate the initiatives taken by the global community to reduce marine litter. (250 words) 15

समुद्री कचरा न सिर्फ एक पर्यावरणीय मुद्दा है, अपितु यह एक सामाजिक-आर्थिक चुनौती भी खड़ी करता है। चर्चा कीजिए। साथ ही, समुद्री कचरे को कम करने के लिए वैश्विक समुदाय द्वारा की गई पहलों को भी सूचीबद्ध कीजिए।

Marine litter is the discarded wastes and microplastics which are disposed off in seas and oceans.

Environmental Issue

- ① Microplastics adversarial for fish
- ② Bioaccumulation and bio-magnification of harmful waste
- ③ Threatens human health → minomata disease (mercury litter)
- ④ Harmful for marine biodiversity
 - ↳ Coral bleaching
 - ↳ Nutrient enrichment → algal bloom

⑤ Plastic waste does not
decompose easily → can cause
accrification

⑥ Oil spills cause dead zones

Socio-Economic Issue

① Loss of tourism potential
↳ Australia's great barrier reef
at risk of losing UNESCO status

② High cost expenditure in cleaning
oil spills

③ Debeautification of beaches and
disruption of fishing communities

④ Loss to seaweed and sea
grass farmers

⑤ Threatens food security
especially for fish dependant
societies like Japan & Norway

International Initiatives

- Bunker Convention → Against oil spill safeguards
 - Ballast Convention → Against release of ballast water & its litter
 - UNCLOS → Local sovereignty in EEZs → ensures better governance
 - Intl. civil society (NGOs and non-government bodies like IMO, WWF and IUCN)
 - IORA summit recently had discussed anti dumping and marine litter issues
- An all out international cooperation is crucial for tackling marine litter.

19. India's response to the Covid-19 pandemic has brought to the fore several inadequacies and ambiguities in India's disaster management framework. Discuss. (250 words) 15

कोविड-19 महामारी के प्रति भारत की अनुक्रिया ने भारत के आपदा प्रबंधन ढांचे में व्याप्त अनेक कमियों और अस्पष्टताओं को उजागर किया है। चर्चा कीजिए।

The Covid-19 pandemic has tested the effectiveness of DM Act 2005—key provisions of which were tested on ground for the first time.

Several inadequacies and ambiguities have been exposed in our disaster management paradigm.

→ Inconsistencies between Centre and state implementation of lock down and opening up

→ The fact that we had to shut completely our economy at low numbers as we grappled with getting resources ready for our administration

- The lack of SDRF in sufficient numbers → states scrambled for front line volunteers
- Ambiguity in Disaster Mgmt. ^{PM} Fund v/s PM CARES and its allocation
- Systematic inadequacies in oxygen supply during 2nd wave
- Initial mix-up and confusion for opening up of vaccines for 18+ adults
- Ambiguities in provisions pertaining to compensation.
 - ↳ SC had to be signed in for 50K award
- Variation in calculation of death and manner across states.

→ state VS Centre tussle on federalism debate due to DCs interchange during lockdown

→ Holding of election matters and Kumbh Mela before second wave while being extremely strict against Tablighi Jamaat and 3 month lockdown in 1st wave.

However, it has also shown some silver linings

- ↳ Roll out of Aarogya Setu for contact tracing in record time
- ↳ High outreach → high vaccination rate & low hesitancy
- ↳ Family well managed 1st wave despite initial hicups.

Thus, the pandemic should serve as an opportunity to first time and learn from the administrative challenges and build on the successful implementations for a secure India.

20. In light of the increasing industrial disasters in India, examine the reasons for their occurrence. Discuss the steps that have been taken to deal with industrial disasters. (250 words) 15

भारत में बढ़ती औद्योगिक आपदाओं के आलोक में, उनके घटित होने के कारणों की जांच कीजिए। औद्योगिक आपदाओं से निपटने के लिए उठाए गए कदमों की विवेचना कीजिए।

There has been an increasing trend of industrial disasters recently.
eg → Sigheer Gas Leak at LG
Polymers in Andhra Pradesh

Reasons for occurrence

- ① Poor administrative oversight
↳ Key culprit ^{company} had been given a green clearance a week before Bhopal Gas Tragedy (Methyl Isocyanate)
- ② Poor safety infrastructure in
industrial to cut costs
- ③ Corruption and bribery to
get environmental and

Occupational safety measures.

④ Slowdown in economy → puts pressure on local government to be more business friendly

⑤ Poor conviction and settlement record by judiciary. Bhopal gas victims still fighting for review in compensation.

Steps taken by Govt.

① Environment Protection Act 1986 → Standards for monitoring effluents

② Public Liability Act → Recognizes no-fault liability → even if the accident is unintentional.

③ Factories Amendment Act has expanded the scope of compensation

to local residents in addition to workers.

④ Hazardous Substances

Manufacture, Import and Usage Rules → Guidelines on procurement and production

⑤ Hazardous Waste Management Rules → checks waste and emissions oversight

⑥ National Green Tribunal → Reinforced no-fault liability.

Thus, despite a strict regulatory regimen, more work is required on the enforcement end to ensure compliance and check the increasing spurt of accidents.