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GENERAL STUDIES (TEST CODE : 856)

Name of Candidate	TAPASYA PARIHAR		
Medium Eng./Hindi	ENGLISH	Registration Number	35234
Center	O.R.N.	Date	03/10/17

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

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 अंगजी और हिन्दी में छपे हैं।
3. All questions are compulsory.
   सभी प्रश्न अनिवार्य हैं।
4. The number of marks carried by a question/part is indicated against it.
   प्रत्येक प्रश्न/भाग के अंक उसके सामने दिए गए हैं।
5. Answers must be written in the medium authorized in the Admission Certificate, which must be stated clearly on the cover of this Question-Cum-Answer (QCA) Booklet in the space provided. No marks will be given for answers written in medium other that the authorized one.
   प्रश्नों के उत्तर उसी माध्यम में लिखे जाने चाहिए जिसका उल्लेख आपके प्रवेश पत्र में किया गया है और उस माध्यम का स्पष्ट उल्लेख प्रश्न-सह-उत्तर (क्यूसीए) पुस्तिका के मुख्य पृष्ठ पर अंकित निर्दिष्ट स्थान पर किया जाना चाहिए। उल्लिखित माध्यम के अतिरिक्त अन्य किसी माध्यम में लिए गए उत्तर पर कोई अंक नहीं मिलेंगे।
6. Word limit in questions, if specified, should be adhered to.
   प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए।
7. Any page or portion of the page left blank in the Question Cum-Answer Booklet must be clearly struck off.
   उत्तर पुस्तिका में खाली छोड़ा हुआ पृष्ठ या उसके अंश को स्पष्ट रूप से काटा जाना चाहिए।

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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

Answer all the questions in NOT MORE THAN 200 WORDS each. Content of the answers is more important than its length. All questions carry equal marks.

12.5X20=250

1. Explain the reasons for the following: (a) Erosional forms dominate in the west coast while depositional forms dominate in the east coast of India. (b) Western Ghats in Karnataka receive more monsoon rainfall than Maharashtra and Kerala.

निम्नलिखित के कारणों की व्याख्या कीजिए: (a) भारत के पश्चिमी तट में अपरदनजन्य रूपों की अधिकता या बाहुल्य पाया जाता है, जबकि पूर्वी तट पर निक्षेपण रूपों का बाहुल्य पाया जाता है। (b) कर्नाटक में पश्चिमी घाट महाराष्ट्र और केरल की तुलना में अधिक मानसूनी वर्षा प्राप्त करते हैं।

a) Erosional forms dominate in the west coast while depositional forms dominate in the East coast.

Reasons:

1) West coast is a submerged coast ~~an~~ whereas East coast is an emerged coast

2) lesser number of rivers join the sea through the west coast and their courses are shorter than the rivers of East coast - this leads to lesser deposition on the West coast

3) Due to west coast being the submerged coast, its topography

undergoes more wave action as compared to the East Coast.

4) East coast hosts bigger deltas of rivers like Godavari, Krishna, Kaveri etc. evidencing more deposition than West coast.

b) Western Ghats in Karnataka receive more rainfall than Maharashtra and Kerala

Reasons :

⇒ size of the coast beside the Western Ghats

→ coasts in Karnataka are narrow as compared to the ones in Maharashtra and Kerala

→ due to this → it gives more orographic lift to the air and it rains more in the Western Ghats - leaving lesser scope of rains in the coasts

2. What do you mean by bad ozone and what are the causes for its formation? Explain the reasons for the depletion of ozone, with special reference to formation of Ozone hole over Antarctica.

बैड ओजोन से आप क्या समझते हैं एवं इसके निर्माण के क्या कारण हैं? अंटार्कटिका के ऊपर ओजोन छिद्र के निर्माण के विशेष संदर्भ में ओजोन अवक्षय के कारणों की व्याख्या कीजिए।

Ozone forms a layer in the stratosphere, which protects the lower layers of atmosphere from harmful UV rays. However, when this Ozone is present in the Troposphere, it acts as a pollutant as it participates in smog formation and thus affecting health. Therefore, bad ozone is the ozone present in the Troposphere which is harmful.

Causes for its formation are:

1) Vehicle exhausts → emitting Oxides of Nitrogen and Volatile Organic Compounds → reactions of which forms Ozone → in the presence of Sunlight

2) Emission from industries etc.

Reasons for stratospheric ozone depletion are the following:

1) Emission of Chloro Fluoro Carbons (CFCs) etc. due to
   - vehicle emissions
   - industrial emissions

2) Emission of Hydro Fluoro Carbons and ~~Hydro Fluoro~~ Hydro Chloro Fluoro Carbons, Chloroform etc.

These compounds remain for long in the atmosphere and react with Oxygen when broken into atomic forms due to UV rays action. These free radicals react multiple times and destroy ozone.

3) Formation of Stratospheric clouds in winter over Antarctica and resultant depletion in Spring when the Chlorine and Bromine depositions on these clouds react in presence of sunlight.

Ozone is essential for human survival thus, there is a need for effective

implementation of Kigali Agreement following up on the Montreal Protocol.

3. Weather and climate information plays a significant role in increasing agricultural productivity as well as minimising crop losses. Comment. In light of the increasing instances of extreme weather events, examine the ways in which information system can be made more effective and inclusive.

मौसम और जलवायु संबंधी सूचना कृषि उत्पादकता को बढ़ाने एवं साथ ही साथ फसल के नुकसान को कम करने में महत्वपूर्ण भूमिका निभाती है। टिप्पणी कीजिए। चरम मौसम की बढ़ती हुई घटनाओं के प्रकाश में सूचना प्रणाली को अधिक प्रभावशाली एवं समावेशी बनाने के तरीकों का परीक्षण कीजिए।

Weather forecasts and climate information are essential for agricultural planning, policy-making, choice of crops, preparedness for drought and other disasters and their management and provisioning of subsidies.

Role in increasing productivity in agriculture and minimizing crop loss:

1) Timely information on rainfall
- its timing (advent of Monsoon),
- its quantity (normal Monsoon or deficient year etc.)

leads to better policy making, planning and preparedness to tackle the upcoming problem.

2) Timely management of resources and mitigation of impacts of droughts or floods or other disasters

3) Provisioning of MSP and other subsidies

4) Scientific crop planning increases efficiency and better productivity eg. more drought resistant crops in deficient Monsoon.

There hasbeen recent incidents of extreme weather events, which have led to losses on huge scale, eg. floods in Bihar, Gujarat, Assam, cloudburst in Hyderabad etc. To mitigate losses and for effective planning information system needs to be robust and inclusive and can be done so by:

1) using ICT → by using media like TV, radio, Mobile SMS, print media etc.

2) Disbursement of information by

IMD timely as it does in 48 hours, 24 hours and 12 hours intervals

3) Invention of mobile applications etc.

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4. India's first National Disaster Management Plan may fulfill the legal requirement of having a plan but it may not be very effective in achieving its objective of building resilience. Critically analyse.

भारत की प्रथम राष्ट्रीय आपदा प्रबंधन योजना, भले ही एक योजना होने की विधिक आवश्यकता को पूर्ण कर सकती है किन्तु यह प्रत्यास्थता निर्माण करने के अपने उद्देश्य को प्राप्त करने में अधिक प्रभावी नहीं हो सकती। आलोचनात्मक विश्लेषण कीजिए।

India recently prepared its First Disaster Management Plan, a document which has been long due.

The Plan has following features:

1) It is in accordance with the Sendai Framework on Disaster Risk Reduction, which India has signed

2) It has given a comprehensive definition of disaster

3) It provides for planning for 5, 10 and 15 years

4) It calls for more co-operation of various agencies and organs of Government

5) It has a regional approach and spells out specific roles for PRIs and Urban Local Bodies

6) It calls for more community participation
7) It identifies major activities related to disaster management
8) Includes preparation of communities, awareness creation and role of media in risk preparedness and governance.

However, the Plan is not without drawbacks, which are:

1) It doesn't get any targets or a definite time frame
2) Framework for funding is missing
3) There is need for other improvements i.e. Involvement of corporate sector, preparedness and co-operation of NDRF and state entities and better usage of technology etc.
4) No provision for disaster insurance

Thus, although creation of plan closes a ~~missing~~ critical gap, it needs to be improved for it to be effective in disaster risk governance.

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5. A better prepared community is key to effective disaster risk reduction. Citing specific examples, examine the importance of the role of local government and community in dealing with disasters.

प्रभावी आपदा जोखिम न्यूनीकरण के लिए एक बेहतर रूप से तैयार समुदाय महत्वपूर्ण है। विशिष्ट उदाहरण देते हुए आपदाओं से निपटने में स्थानीय सरकार एवं समुदाय की भूमिका के महत्व का परीक्षण कीजिए।

Community participation is one of the pillars on which efficient disaster management rests.
Disaster risk reduction calls for greater community participation and its preparedness.

Role of community

1) Pre - disaster

① Zoning and provisioning of facilities
② Readiness of personnel in areas like medicine, transportation, food etc.
③ Planning for evacuation
④ Use of local knowledge in searching for safer places and in creation of disaster resilient infrastructure for example, specially designed houses in Sikkim
⑤ Mock drills in schools, offices etc.

⑤ Creating a cell of blood donors
⑥ Capacity building and dissemination of information eg. through auto-Rickshaws etc.

2) During disaster

① use of youth for helping others like seen in Chennai floods and recent Mumbai and Gujarat floods
② use of people in spreading information by using social media etc.
③ Community participation in provisioning of food and other essentials
eg. during Tsunami, Rural Knowledge Centres in Pondicherry helped much

3) Post disaster

① rehabilitation of injured
② provisions for basic necessities
③ help with lost and found
④ manpower to remove debris etc.
⑤ health and psychological assistance etc.
eg. in Bihar floods, people came together to help each other

Owing to the importance of community Sendai Framework for Disaster Risk Reduction calls for greater community preparedness and participation

6. Oceanic crustal rocks are much younger than the continental crust rocks. Explain with the help of the concept of sea floor spreading.

महासागरीय पर्पटी की चट्टानें महाद्वीपीय पर्पटी की चट्टानों की अपेक्षा अधिक नवीन हैं। सागरीय अधस्तल विस्तार की अवधारणा की सहायता से व्याख्या कीजिए।

The ~~the~~ concept of sea floor spreading was developed by Hess. This concept explains why we find that oceanic crust is younger than continental crust.

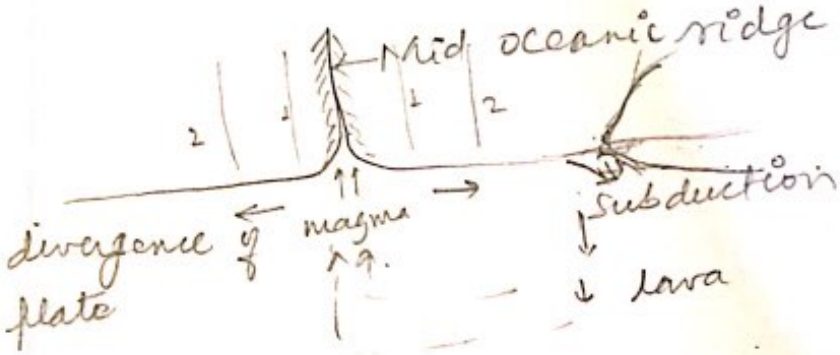
According to the theory, when oceanic magma rises below the mid oceanic ridges and spread in opposite directions, it ~~gu~~ causes the oceanic crust to move in opposite direction causing divergence of plates. This divergence causes consequent~~s~~ conversion at the other end of the plate, wherein the plate undergoes subduction. The divergence causes generation of new oceanic crust and subduction melts the crust and forms magma, thus completing a cycle.

This evidence of sea floor spreading

can be gathered from the fact that rocks equidistant from mid oceanic ridge are similar in age and composition.

This explains the fact of younger age of oceanic crust which is being generated and destructed as compared to the continental crust.

The same can be shown with the help of the following diagram :



1, 2 suggest the ages of rocks.

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(इस भाग में कुछ ना लिखें)

7. The composition of lava materials determines the types of volcanoes. Illustrate. Also give an account of intrusive landforms formation due to volcanic activities.

लावा पदार्थों का संघटन ज्वालामुखियों के प्रकारों को निर्धारित करता है। उदाहरण देकर स्पष्ट कीजिए। साथ ही, ज्वालामुखीय क्रियाओं के कारण अंतर्वेधी आकृतियों के गठन का विवरण भी प्रदान कीजिए।

Lava is the molten earth that is ejected from the volcano. The composition of lava, decides and determines the types of volcanoes due to its difference in viscosity, material composition like ash and pyroclastic debris etc.

Following are the kinds of volcanoes and their different lava compositions:

1) Shield volcano
made up of basaltic lava, which is very fluid, thus goes far and this volcano is not very steep. Also, due to its fluidity, grains of dried lava are large.

2) Composite volcano
this contains lava, ashes and pyroclastic material. Lava is more viscous here. The volcano

consists of vent openings and has layers.

3) Caldera
this contains more ashes and causes explosion when erupt. This creates a crater on top.

4) Flood Basalt Provinces
these are made up of fluid Basalt, which due to viscosity goes a long way and create plateaus of Basalt eg. Deccantrap.

There are various intrusive landforms caused by volcanic activities, which are following:

1) Batholiths
large domes created by cooling of magma in the layers of crust in deep

2) Phacoliths
wavy mass of intrusive form, when magma moves upwards

3) Lapolith
Gauer shaped, connected to magma source through a conduit

4) Dykes
vertical structures, caused by cooling of magma in fissures

5) ~~Lapolith~~ sills
horizontal, plate type structure

8. What do you understand by sea farming? Analyse its prospects and potential to provide sustainable livelihood within the country. Also bring out the challenges in adoption of this technique.

सी फॉर्मिंग (सागरीय कृषि) से आप क्या समझते हैं? देश के लिए संधारणीय आजीविका प्रदान करने हेतु इसकी संभावनाओं और क्षमता का विश्लेषण कीजिए। इस तकनीक को अपनाने में आने वाली चुनौतियों को भी स्पष्ट कीजिए।

Sea farming is the process of cultivation ~~of~~ in sea water, be it in open ocean or in an enclosed tank with sea water. Sea farming is ~~either~~ done for marine food or sea weed etc.

With the changing food preferences, demand for sea food has been increasing. Sea farming has huge potential due to:

1) food security and nutritional requirements
2) medicinal properties of sea weed
3) sustainable food production and livelihood
4) complementary livelihood for shore population
5) Presence of long coastline gives

it better prospects for sea farming

6) It will complement India's exports too in sea food.

However, there are certain challenges:

1) illiteracy and low level of awareness of coastal communities

2) large funding requirements initially to set up equipments etc.

3) waste generation - lack of knowledge about its effect

4) diversification - of sea food → majorly skewed in favour of prawns and shrimps

5) technological developments are required.

Thus, sea farming, having great potential and prospects in India can benefit India with nutrition-al and other food and medicinal

requirement and augment income of farmers and coastal communities.

9. Explain the origin of earth's magnetism. Discuss its significance with special reference to its interaction with solar particles as well as artifical satellites.

पृथ्वी के चुंबकत्व की उत्पत्ति की व्याख्या कीजिए। सौर कणों और साथ ही कृत्रिम उपग्रहों के साथ इसकी अंतरक्रिया के विशेष संदर्भ में इसके महत्व पर चर्चा कीजिए।

There have been various theories explaining magnetism of Earth. The magnetic field of Earth is similar to a bar magnet.

Earth's magnetic effect is due to the circulation of current in its core. The inner core which is solid is surrounded by molten outer core - wherein the iron risen and cools and sinks - creating convectional currents. This is facilitated by rotation of Earth.

Significance

1) Magnetosphere causes deflection of solar flares, which is evidenced by formation of Aurora at both the poles.

2) It protects the satellites within the magnetosphere

3) Magnetic reversals provide knowledge about age of rocks

4) Magnetic field facilitates navi-gation

5) Disturbance can cause variation in directions, electronic utilities, communication systems etc.

Thus, magnetism of Earth is of great significance and acts as a protector for the Earth.

10. An emissions-reduction approach to fighting global warming is not enough. Alternative solutions involving climate engineering might have to be deployed sooner than we think. Defining climate engineering, critically examine the statement.

ग्लोबल वार्मिंग से निपटने के लिए केवल उत्सर्जन-न्यूनीकरण उपागम (दृष्टिकोण) पर्याप्त नहीं है। संभवत: हमें अनुमानित समय से पूर्व ही,क्लाइमेट इंजीनियरिंग को सम्मिलित करने वाले वैकल्पिक समाधान को अपनाने की आवश्यकता पड़ सकती है। क्लाइमेट इंजीनियरिंग को परिभाषित करते हुए, इस कथन का आलोचनात्मक परीक्षण कीजिए।

Almost all the climate treaties and agreements and negotiations have been deliberating upon emission reductions to fight global warming, be it the Paris Agreement or the Kigali Agreement.

However, there is a need to move away from this approach, because even the Paris Agreement, which bases it commitment on emission reduction largely, can't, even if fully implemented, stop warming of Earth below 3.1°C. (Emission gap)

Moreover, only a few countries have included afforestation as

a tool in their INDCs.

Therefore, there is a need for climate engineering tools to reduce global warming.

Climate engineering is the practice of using various non-conventional tools and technology to achieve desired results by manipulating climate. It is also known as geo-engineering.

These are some of the climate engineering methods:

1) cloud seeding to cause artificial rain
2) Aerosol injection in Stratosphere to reflect sunlight
3) Placing mirrors in atmosphere
4) Carbon capture and storage in old mines, oceans etc. permanently → best example is planting more trees
5) ~~artificial trees to generate sunlight~~

However, emission reduction approach has also done much to control global warming especially under the Kyoto Protocol.

Moreover, geo engineering has some drawbacks like it needs excessive funding, diversion of funds to technology development, not much knowledge about working of ideas etc.

11. While India embarks upon building urban infrastructure such as smart cities over the coming years, it is important that cities and infrastructure being built take into account the vulnerability of the area to various hazards. Discuss in context of recent flooding in major cities of the country.

भारत द्वारा आने वाले वर्षों में, स्मार्ट शहरों जैसी शहरी अवसंरचना का निर्माण प्रारम्भ करने को ध्यान में रखते हुए यह महत्वपूर्ण है कि शहर एवं अवसंरचनाओं के निर्माण के समय विभिन्न खतरों के प्रति क्षेत्र की जोखिम सुभेद्यता को ध्यान में रखा जाए। देश के प्रमुख शहरों में हाल में आयी बाढ़ों के संदर्भ में चर्चा कीजिए।

With the increase in frequency and damage of disasters, it is important to make our cities resilient to various hazards.

India has undertaken various schemes to improve urban infrastructure like smart Cities Mission, AMRUT, Housing for All, slum redevelopment scheme etc.

With the increasing urban population, it is required to create infrastructure keeping in mind the vulnerability of the area.

Poor urban planning is one of the reasons for damages caused by recent floods in various parts of India like Chennai, Mumbai,

Gujarat etc.

Various reasons for urban flooding are:

1) Poor planning of ~~drainage~~ drainage system
2) Overcrowded houses and lesser areas for percolation of water
3) drainage blockage by plastic waste etc.
4) unscientific and unecological use of wastelands ~~and~~ which can be used for seepage of flood water into earth
5) Encroachments on water bodies eg. Bengaluru had 262 lakes in 1960s and now it has only 10.
6) ~~lower~~ ~~to~~ lesser trees and clearing forests for urbanisation
   - forests cause ~~gro~~ water to seep in ground
7) Reclamation of coastal areas
   - due to this more impact of cyclones, storm surges etc. can be felt.

Thus, urban cities need to be constructed and planned keeping in mind the vulnerability of areas in accordance with UN Habitat III commitments and the Smart Cities Mission take it into its fold.

12. Explain how anthropogenic activities effect the intensity and magnitude of landslides. Discuss with special reference to impact of climate change on landslides in India.

व्याख्या कीजिए कि मानवीय गतिविधियाँ भूस्खलन की तीव्रता और परिमाण को कैसे प्रभावित करती हैं।भारत में भूस्खलनों पर जलवायु परिवर्तन के प्रभाव के विशेष संदर्भ के साथ चर्चा कीजिए।

Landslides are very common in hilly areas and affect life and property to a great extent. In India they are rampant in Himalayas, North Eastern Hills, Western and Eastern Ghats etc.

Landslide are generally due to liquifaction of soil, earthquakes or heavy rainfall. However, there has been increasing impact of anthropogenic activities on landslides, its intensity and magnitude.

1) Deforestation

this is the major cause of landslides. Trees hold the soil below, and due to deforestation soil gets loosened up.

Moreover, deforestation has facilitated

more urbanization and due to that there is unscientific use of land taking place which proliferates landslides

2) Mining
this is another important cause, which causes landslide due to unfilled old mines buckling under pressure and use of dynamites etc. for mining

3) Road construction etc.

4) Climate change
a) Due to all the anthropogenic activities there are more incidences of cloudbursts, heavy rains etc. which cause landslides

b) Also, melting of glaciers ~~are~~ is exposing new soil and that is prone to landslide

5) Recent incidents of landslide caused due to unsustainable sewage dumping (plastic) practices

6) Excessive grazing also loosens up the soil.

Thus, there is a need for hazard zone mapping and keeping in mind the delicate ecology of hills.

13. Discuss the impact of climate change on agriculture and food security in India. How are these aggravated during the times of disasters? Mention the steps that need to be taken in order to ensure adequate and affordable food supply for this impending crisis.

भारत में कृषि और खाद्य सुरक्षा पर जलवायु परिवर्तन के प्रभाव की चर्चा कीजिए। आपदाओं के दौरान इनसे संबंधित समस्यायें किस प्रकार और अधिक बढ़ जाती हैं। इस आसन्न संकट के लिए पर्याप्त और वहनीय खाद्य आपूर्ति सुनिश्चित करने हेतु उठाए जाने वाले आवश्यक कदमों का उल्लेख कीजिए।

Agriculture is worst affected by climate change, which itself contributes to the causes of climate change. And with the 1.1% growth rate in world population, food security in itself is a challenge which becomes serious with climate change and its impact on agriculture.

Following are the impacts of climate change on agriculture and food security:

1) Unpredictable rainfall
Vagaries of monsoon, when 50% of net sown area dependant on rainfall causes drought and floods - causing damage to crops

2) Increased pest attacks

3) Increased soil degradation and

soil emitting more CO_2 now - which impacts climate change

4) low yield
5) new diseases
6) Anti microbial resistance in animals and poultry
7) fish kills and snowfall causing damage in orchards

These impacts gets aggravated during disasters, for example:

1) during floods
   - crops get destroyed
   - godowns get inundated
   - soil gets eroded
   - horticulture is affected
2) Droughts affect all crops & animals for fodder
3) With cyclones, paddy fields get affected

Following steps need to be taken:

1) Control global warming
2) reduce emissions from agriculture eg. recent reports of ammonia concentration over agricultural areas
3) make agriculture climate resilient like Climate Smart Agriculture

practices eg. in Madhya Pradesh
4) Utilising local knowledge
5) rainwater harvesting
6) Better healthcare for animals
7) use of Science and Technology and Information technology
8) better forecasting of weather and readiness
9) Efficient MSP provisioning and tilt towards organic farming
10) moving away from unsustainable and unscientific farming practices

14. Discuss how drought is more of a man-made disaster than a mere deficiency of rainfall. Elaborate on the consequences of desertification that drought prone regions face. Also, bring out the preventive steps to be taken in light of targets to curb desertification as mentioned under the SDGs.

चर्चा कीजिए कि किस प्रकार सूखा केवल वर्षा की कमी से पैदा आपदा न हो कर मुख्य रूप से एक मानव-निर्मित आपदा है। सूखा प्रवण क्षेत्रों द्वारा सामना किए जाने वाले मरुस्थलीकरण के परिणामों को विस्तार से बताइए। साथ ही, मरुस्थलीकरण पर अंकुश लगाने के लिए SDGs के अंतर्गत उल्लिखित लक्ष्यों के प्रकाश में उठाए जाने वाले निवारक कदमों को स्पष्ट कीजिए।

Drought is assessed with respect to the deficiency in rainfall. However, sometimes drought is not merely due to meterological phenomenon but is man made. Following evidences the same:

1) unscientific and unsustainable agricultural practices
eg. sowing paddy – crop requiring high water intensity in drought prone areas

2) non judicious use of ground water resources

3) not utilizing rainwater and not recharging groundwater aquifers due to
– deforestation
– urbanization of water bodies

4) Unsustainable utilization of groundwater for industrial and other purposes like household
5) Water pollution - rendering water unusable

Consequences of desertification :

1) Yield loss
2) Newer pest attacks
3) Animal deaths due to starvation as an effect of low availability of fodder
4) increase in food prices
5) Famine
6) Farmer suicides
7) large scale migration of humans and animals
8) Diseases due to low quality water

Preventive steps that can be taken are:

1) Rainwater harvesting
2) Cropping to be related with ecology of the area
3) Drought resistant varieties of crops and seeds

4) technological advancements like Israel uses saltwater making it potable
5) Wastewater treatment
6) Scientific policies with respect to MSP and subsidies of electricity
7) Afforestation
8) Creating band of trees and social and farm forestry be encouraged

SDGs contain targets to prevent land degradation and desertification which in turn endanger agricultural productivity and food security.
UN convention to Combat Desertification need to be implemented in its spirit.

15. What is the role of NDRF in managing disasters in the country? Highlighting the challenges that NDRF has been facing, discuss why it is still the armed forces which end up being the most visible force at hand during disasters.

देश में आपदाओं के प्रबंधन में NDRF की क्या भूमिका है? NDRF द्वारा सामना की जाती रही चुनौतियों पर प्रकाश डालते हुए चर्चा कीजिए कि आपदाओं के दौरान केवल सशस्त्र बल ही क्यों अभी भी सहज और सर्वाधिक उपलब्ध बल के रूप में दृष्टिगोचर होते हैं।

NDRF is maintained to respond to disasters. It is only such force in the world dedicated for disaster management.

Role of NDRF:

NDRF plays a very important role from rescuing people from under the debris post earthquake or cyclones to people stuck in flooded waters and jams. It participates in providing food supplies to people during disasters and making people meet their family members. They conduct search and rescue operations. They are especially trained in disaster management, thus they are efficient in their working.

However, there are various challenges that NDRF is facing, which are the following:

1) Lack of manpower
Although the government has increased the batallions to 13, there is still lack of manpower as there is increase in disasters incidents, and sometimes at many places simultaneously

2) Co-ordination with state forces
this creates another problem during disasters

3) Lack of adequate equipments and advanced tools
this is basically due to lack of funding

4) Lack of knowledge of area of disasters → thus needing local collaboration for efficient evacuation etc.

Nevertheless, NDRF is still the go to force, and most because visible
1) well trained personnel

2) dedicated only to disaster management

3) inadequate state assistance

4) complications involved in operations

Thus, NDRF needs to be maintained properly.

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

16. Give an account of the different types of earthquakes based on their zone of occurrence. Identify the earthquake prone regions of the world with special reference to India. Also explain the reasons for the occurrence of earthquakes in geologically inactive regions like Peninsular India.

घटित होने वाले क्षेत्र के आधार पर विभिन्न प्रकार के भूकंपों का विवरण प्रदान कीजिए। भारत के विशेष संदर्भ में विश्व के भूकंप प्रवण क्षेत्रों की पहचान कीजिए। साथ ही, प्रायद्वीपीय भारत जैसे भूवैज्ञानिक रूप से निष्क्रिय/स्थिर क्षेत्रों में भूकंपीय घटनाओं के कारणों की भी व्याख्या कीजिए।

Earthquake is the sudden shaking of ground. There are various kinds of Earthquakes, based on their impact and their origin.

Earthquakes based on impact:

1) Shallow
These ~~are~~ have the epicentre near the surface of Earth and cause much ~~2) Deep~~ destruction

2) Deep
These have epicentre deep in the earth, have lesser impact on the surface

Earthquakes based on origin/source:

1) Volcanic
When occurred due to volcanoes

2) due to mining ~~or~~ other artificial ground shaking

3) Plate movements

Earthquake prone regions of the world generally lie in the areas of either plate boundary divergence or convergence and areas of active vulcanism like the Ring of fire in the pacific.

Earthquakes in India are mainly confined to Himalayas and the foothills. Indian earthquake regions are divided into 4 seismic zones based on the intensity and frequency of occurrence and its susceptibility to earthquakes.

Zone V - is the zone of high susceptibility to earthquakes, includes the Himalayan region, North Eastern Hills, areas in Gujarat ~~aroun~~ and Rajasthan

Zone IV → includes areas around Zone V

Zone II is the least risk zone which includes the peninsular region.

These are arranged in the order of seismic activity.

However, earthquakes occur in the geologically inactive regions like peninsular India due - which is

mainly due to some man made ~~reasons~~ reasons like mining in the hills, dynamite testing, weapons and missile testing ~~etc~~., dams etc.
But there are natural reasons too like stress caused due to collision of Indian and Eurasian plate and possible breaking of Indian plate in areas in Maharashtra.

17. Temperature, density and salinity are three most important physical properties of Ocean. Explain how these all are interdependent. Also examine the impact of climate change on these properties.

तापमान, घनत्व और लवणता महासागर के तीन सर्वाधिक महत्वपूर्ण भौतिक गुणधर्म हैं। व्याख्या कीजिए कि ये सभी किस प्रकार अन्योन्याश्रित हैं। साथ ही, इन गुणधर्मों पर जलवायु परिवर्तन के प्रभाव का भी परीक्षण कीजिए।

Oceans occupy 70% of the Earth's surface and temperature, salinity and density define the various properties of oceans.

Temperature plays a great role in rainfall, sea and land freeze, ocean currents and moderating influence in western temperate regions like UK. It also causes stratification and mixing of layers of ocean water as colder surface water tends to sink in leading to upwelling of nutrient rich water. Marine species are susceptible to temperature.

Salinity is another feature defining factor for oceans which affects the freezing and boiling points, ocean current movements and richness of species.

Density of ocean water causes vertical and horizontal movement, leading

to ocean currents and stratification. Moreover, all these are interdependent, for, temperature causes salinity change (evaporation causes more salinity) and density change (colder the water, saline it is) and salinity causes density change (more ~~dense~~, saline, denser) thus defining ocean properties.

Impact of climate change:

1) On temperature

Due to climate change ocean temperatures are rising, leading to thermal expansion and impacting the hydrological cycle.
This also leads to ecological problems because increased temperatures cause greater Biological Oxygen Demand due to greater metabolical processes.

2) On density

Temperatures on surface are increasing and water density is decreasing from temperate regions to tropics, causing changes

in ocean currents

3) Salinity
With rising temperatures, evaporation is increasing, leading to more salinity. However, there are anomalies due to melting of glaciers and the water addition due to that

Thus, there is a great impact of climate change on oceans, which is acknowledged by the recent UN Oceans Conference.

18. Critically discuss the effectiveness of initiatives such as "odd-even" and "Car free day" in coping up with the issue of urban air quality and traffic congestion.

शहरी वायु गुणवत्ता और यातायात संकुलन (भीड़-भाड़) जैसे मुद्दों का सामना करने में 'ऑड-ईवन' (सम-विषम) और 'कार फ्री डे' जैसी पहलों की प्रभावशीलता पर आलोचनात्मक चर्चा कीजिए।

India hosts 13 of the 20 most polluted cities from air pollution. The EPCA has provided a graded action plan to tackle air pollution in the Delhi NCR region and also the Odd-even plan was adopted by the Delhi government on a trial basis, which was also adopted by France. Recently, Gurugram had Car free days, urging people to use other forms of transports like public transport and bicycles etc.

Effectiveness of such initiatives :

1) In India, Bharat stage IV was applied only in 63 cities before April 2017 – which implies that Indian vehicles cause more pollution

2) Greater density of private vehicles on roads even with proliferation of taxi services

there are more vehicles on roads now

3) These can cause immediate relief from problems of air pollution
4) These cause notice of people towards the environmental problems

However, these policies are effective to a certain limit only because:

1) reasons for air pollution are not only vehicular emissions but industrial causes and stubble burning and diwali and other celebrations using crackers and these need to be tackled effectively. Also, the thermal power plants and construction activities cause much pollution
2) Industrial vehicles etc. got exemption from policies which are major sources of pollution
3) Policy implementations required like leapfrogging to Bharat Stage VI norms etc.

Thus, solution to problems of air pollution

lies in holistic changes in activities ~~no~~ and not focussing on just the immediate ones.

19. Despite having large deposits of coal, we continue to import it for our domestic use. What are the challenges which we face in meeting our domestic demand? Do you think meeting the social commitments of our country would be challenging in light of our INDC commitments?

कोयले के विशाल भण्डार होने के बाद भी, हम अपने घरेलू उपयोग के लिए इसका आयात करते हैं। अपनी घरेलू मांग को पूरा करने में हम किन चुनौतियों का सामना करते हैं? क्या आप यह सोचते हैं कि हमारी INDC प्रतिबद्धताओं के प्रकाश में अपने देश की सामाजिक प्रतिबद्धताओं को पूरा करना चुनौतीपूर्ण होगा?

India imports large amount of coal from abroad although it has large deposits of coal.

Following are the reasons:

1) Non-Availability of good quality coal
India hosts reserves of coal but lacks in good quality coal

2) Hosts third largest steel industry – needs coking coal of good quality which India lacks.

3) Indian coking coal needs to be washed before being used

~~Therefore~~

4) Problems with extraction of coal due to environmental clearances not available

5) Dependance on thermal power plants – this increases coal requirement – which can't be

satisfied with domestic coal production.

India has committed to produce more energy from Renewable sources ~~by~~ (175 GW by 2022) and reduce energy from coal which at present it more than 80% of total production.

Meeting social commitments will be challenging to achieve INDC targets:

1) India needs to maintain its growth – which requires better infrastructure i.e. power
2) Renewable sources are expensive and have long gestation periods
3) Lower technological development.
4) Increasing population in the country
5) Power very important for all sectors of economy.
6) Social infrastructure like health, education depend on power

Meeting social commitments not challenging to achieve INDC targets

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because:

1) Technology and funding support from developed countries
eg. ~~ISA~~ Paris Agreement

2) New alliances
eg. ISA

3) competition has decreased prices of renewable energy
eg - solar energy

~~4) electrification of Railways~~

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20. Forest fires have become a regular feature during summers in the Western Himalayas. What are the causes behind this phenomenon? Critically examine the efforts made by authorities in countering this problem. Do periodic forest fires have any benefits associated with them?

पश्चिमी हिमालय में ग्रीष्म ऋतु के दौरान दावानल/वनाग्नि (फॉरेस्ट फायर) एक नियमित घटना बन गयी है। इस परिघटना के पीछे क्या कारण हैं? इस समस्या से निबटने के लिए प्राधिकरणों द्वारा किए गए प्रयासों का आलोचनात्मक परीक्षण कीजिए। क्या समय-समय पर होने वाली दानावल की घटनाओं के कुछ लाभ भी हैं?

There has been increase in incidences of forest fires especially in the Western Himalayas in summers.

The causes are:

1) Prevalence of chir pine needles in forests which have high resin content and susceptible to fires
2) Activities of local communities like - clearing of forests
   - shifting cultivation
   - dumping burnt cigarettes etc.
3) lesser rainfall in western himalayas which causes lesser humidity and greater chances of fires
4) tourism activities - eg. camping and bonfires etc.

There have been various efforts by authorities which are as follows:

1) replacing chir pine trees for broad leaved trees
2) allowing collection of fallen leaves
3) infrastructure to control fires and provisioning of ~~infrastructure~~ equipments for the same
4) increased participation of local communities and monitoring forests by them
5) creating awareness among locals regarding causes of fires
6) creation of small water bodies for easy availability of water for dousing off fire
7) mapping of fire vulnerable zones

However, fires are not destructive but sometimes beneficial too, for example -

1) it causes regeneration of minerals in soil
2) many tree species require forest fires for seed germination
3) heating of soil causes increased microbial activity in soil

With 90% forest fires being man made, these can be controlled with adequate policy intervention and use of technology adequately.