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GENERAL STUDIES (TEST CODE : 1225)

Name of Candidate	NIDHI THAKUR		
Medium Eng./Hindi	ENGLISH	Registration Number	44930
Center	ONLINE (PATNA)	Date	18/8/19

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 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 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 निर्दिष्ट 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. Contextual Competence
2. Content Competence
3. Language Competence
4. Introduction Competence
5. Structure - Presentation Competence
6. Conclusion Competence

Overall Macro Comments / feedback / suggestions on Answer Booklet:

1.

2.

3.

4.

5.

6.

All the Best

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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. The consequences of India's megacities producing tonnes of waste are troubling. Elaborate the statement and also discuss the significance of Solid Waste Management Rules 2016 in this regard.

भारत के मेगा नगर जो अत्यधिक मात्रा में अपशिष्ट उत्पन्न कर रहे हैं, के परिणाम चिंताजनक है। इस कथन का सविस्तार वर्णन कीजिए और इस संबंध में ठोस अपशिष्ट प्रबंधन नियम, 2016 के महत्व की चर्चा कीजिए।

Indian cities produce almost 150,000 tonnes of solid waste daily.

90% collected

↓

20% recycled → mostly by informal sector

↓

rest dumped

consequences

① Pollution – air pollution – burning releases CO_2, other greenhouse gases, furans, dioxins

water pollution – leaches into ground water and directly released into rivers/lakes

↓

oceans

land pollution – poor quality land fills → methane → leachate

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② disaster - clogging of drains
↓
Urban floods

③ biodiversity - ~~both~~ riverine, terrestrial and eg marine biodiversity

④ Health - diseases such as cancer, Lung disease, heart disease, endocrine ailments.

⑤ Other kinds of waste → Sewage, e-waste
Hazardous waste, medical and pharmaceutical waste etc pose different type of challenge. - more toxic
- loss of economic value

Significance of SWM, 2016

① Role of urban and local self governments specified - broader coverage

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(ii) compulsory segregation of waste
- must for recycling and success of waste-to-energy plants.

(iii) Integration of informal waste collection micro economy into formal sector by state govt and self help groups.

(iv) Generator - pays user fees to collector

(v) fine for littering/non segregation

The need is to implement the rules and promote the concept of circular economy by reduce, reuse, refuse recycle approach.

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2. What do you understand by compensatory afforestation? Discuss the key elements of government's policy in this context.

क्षतिपूरक वनीकरण से आप क्या समझते हैं? इस संदर्भ में सरकार की नीति के प्रमुख तत्वों की चर्चा कीजिए।

Afforestation after cutting of forests for non-avoidable purposes to compensate for it → compensatory afforestation. → via payments (include CA + NPV + project specific payments)

Government's policy :-

India's target (INDC) is to create 2.5-3 billion tonnes of additional carbon sink.

For this deforestation needs to be checked and afforestation promoted.

Sometimes deforestation may be necessary for development purposes. The project developer is then obligated for compensatory afforestation.

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→ To implement this compensatory afforestation act, 2016 → enacted.

→ User agencies deposit fund into compensatory afforestn fund over past 10 years.
National – 10%, state – 90%.
Rules for utilisation of the fund has now been notified [almost ₹66000 cr accumulated in the fund is under Ad hoc body – (CAMPA)] :– For states
80% – utilised for plantation
natural regeneration of forests
pest and disease control in forest
forest fire prevention
habitat conservation etc
20% – infrastructure related listed works.

issues with this approach → Plantation

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cannot truly compensate for natural forest.

- Other programmes, for e.g. Green India mission – There is a need to coordinate – to deploy financial resources properly.
- Choice of trees should be according to climatic zones – for e.g. eucalyptus in grasslands not suitable
- misutilisation of funds for other purposes should be stopped.

Thus there is a need to scientifically manage and regenerate our forests.

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3. Discuss the need for Green Financing. Mentioning some of the major global initiatives for it, highlight the climate finance architecture in India.
हरित वित्तपोषण की आवश्यकता की चर्चा कीजिए। इसके लिए कुछ प्रमुख वैश्विक पहलों का उल्लेख करते हुए, भारत में जलवायु वित्त संरचना पर प्रकाश डालिए।

Green financing → ~~financing of~~ financial instrument & investments issued to any agency for delivery of positive environmental externalities

Need for green financing :-

(i) reducing fiscal space of governments to support projects

(ii) climate change - already 1° warmer Urgent need of such projects

(iii) Rising demand - with people and business becoming conscious.

Major global initiatives :-

UNFCC → global environment facility

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GEF acts as a financial mechanism for other conventions also.

② Green climate fund :- created by UNFCC in 2011

③ clean development mission and (CDM)
Joint implementation (JI) under kyoto protocol - to carry out emission reduction projects in developing and developed countries respectively.

④ Climate bond initiative

⑤ Green Bond issued by world bank.

⑥ Blue bond issued by Seychelles.

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Climate finance architecture in India

① tax and cess – coal cess;
cess on petrol and diesel (budget 2019-20)

② Renewable purchase obligations for DISCOMs via ~~Escerts~~ (REC) traded in power exchange

③ Platform achieve trade → under NMEEE via ESCerts

Ultimately the aim is to incentivise environmentally sustainable source of energy compared to polluting ones.

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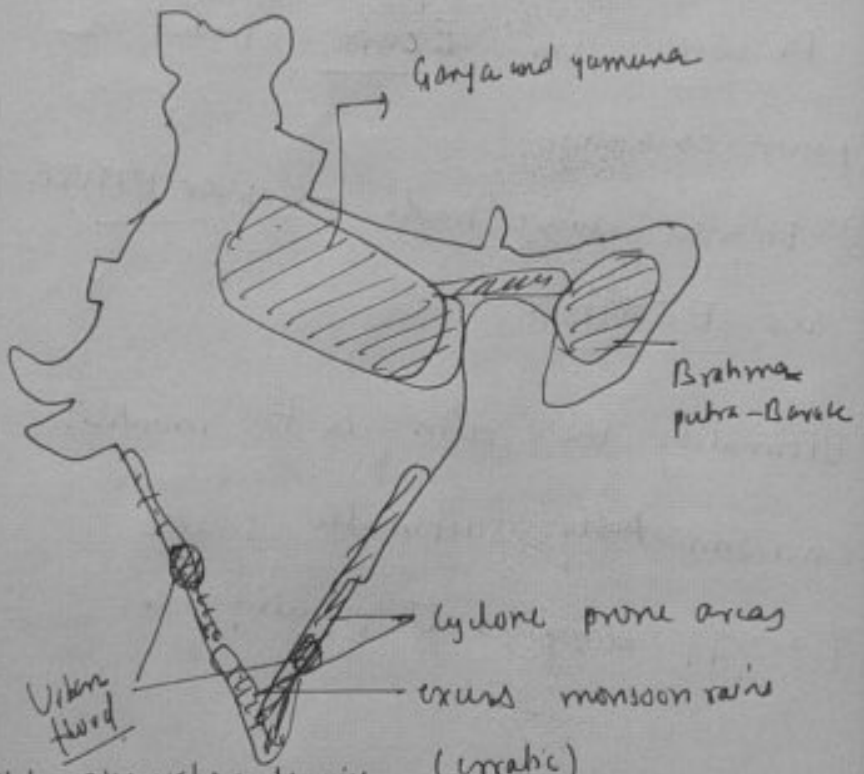
4. List the different flood prone regions in India and identify the reasons behind their frequent flooding. What are the NDMA guidelines for management of floods?
भारत के विभिन्न बाढ़ प्रवण क्षेत्रों को सूचीबद्ध कीजिए और उन क्षेत्रों में बार-बार बाढ़ आने के कारणों की पहचान कीजिए। बाढ़ प्रबंधन हेतु NDMA के क्या दिशा-निर्देश हैं?

12% of India's total area (~40 million hectare) is flood prone.



Reasons behind frequent flooding :-

(1) Natural- floods are a natural

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phenomenon — with positive effects

a) heavy rainfall concentrated in 3-4 months

b) North - North eastern — young rivers, fragile mountains
↓
heavy silting → frequent change in course

c) high seismicity

② Anthropogenic — increased runoff due to deforestation, poor land use.

- interference in drainage — bridge, roads etc

- population pressure - encroachment on flood plain, river ~~braid~~ bed

- over grazing, over cultivation

③ cyclones — heavy rainfall
storm surge

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(b) Unscientific dam management :-
Kerala - 2018, Maharashtra Karnataka 2019

NDMA guidelines

(1) ~~Preparedness~~ Prevention :- (Structural)
Dams/Reservoirs ; embankments/levees ; drainage improvement & removing obstacles ; channel improvement by dredging at confluence, outfalls ; diversion of flood water ; catchment area treatment, anti erosion work

(Non structural) - flood plain zoning
flood proofing of structures and buildings - raised height.

(2) Flood management plans by all depth
(3) Training, awareness generation
(4) Capacity building of all stakeholders including community, CBO, NGO
(5) Response - Incident command system through emergency operation centre
(6) Flood forecasting and warning :- increasing number of rain and rainwater gauges
(7) Transboundary coordination.

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5. What are the priorities for action identified under the Sendai Framework for Disaster Risk Reduction? Elaborate how India's National Plan for Disaster Management has tried to integrate Sendai Framework.
आपदा जोखिम न्यूनीकरण के लिए सेंडाई फ्रेमवर्क के अंतर्गत चिन्हित कार्यवाही हेतु प्राथमिकताएं क्या हैं? सविस्तार वर्णन कीजिए कि किस प्रकार आपदा प्रबंधन के लिए भारत की राष्ट्रीय योजना ने सेंडाई फ्रेमवर्क को समाहित करने का प्रयास किया है।

(#) SFDRR adopted by UN for comprehensive disaster management

Priorities for action :-

(1) Understanding risk

(2) investment in Risk reduction for resilience

(3) Governance in disaster risk.

(4) enhance preparedness for response and build back better for recovery, rehabilitation and reconstruction

India's NADM has tried to integrate by chosing 5 thematic areas for action :-

(1) Understanding risk (2) intragency coordination

(3) investing in structural (4) investing in non-structural

(5) capacity development

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Actions :-

① Integrating approach and role clarity :- horizontal and vertical integration - regional approach which will be also be used for development planning → thus reducing risk and improving governance

② identified major activities for eg early warning, dissemination, medical care, fuel, transport, search, rescue etc - thus enhancing preparedness

③ has given a general framework with enough flexibility to improve governance

④ focus on training, capacity building, integrating best practices.

⑤ Promoting design which is scalable

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issues — too generic and without any specific timeline. Fund mobilisation is also not clear.

Need is to invest more in research and development and including disaster risk reduction at the time of development planning itself. It should be followed by proper monitory and evaluation

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6. Define the term invasive species and provide examples from flora and fauna in India. What are the threats associated with the expansion of invasive species? In this context also discuss measures to address these threats.
आक्रामक प्रजातियों को परिभाषित कीजिए और भारत में वनस्पति एवं जंतु जगत से उदाहरण प्रस्तुत कीजिए। आक्रामक प्रजातियों के विस्तार से जुड़े खतरे क्या हैं? इस संदर्भ में इन खतरों को दूर करने के उपायों की भी चर्चा कीजिए।

Species which exist outside their present or past area of occurance and are a threat to biodiversity - invasive alien species.

e.g Fauna :- African apple snail, Papaya mealy Bug, Cotton mealy bug, African amazon sailfin catfish. Among flora:- Parthenium, Acacia ~~Cassia auriculata~~, Prosopis Juliflora etc.

- They have become ~~bi~~ more common due to increasing trade and globalisation. They then thrive due to absence of any natural predator.

Threats :-

1) competition for local flora / fauna

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ii) disrupt the food chain

iii) may act as disease transmitting agent.

iv) can even lead to extinction of other species

v) Pest in agriculture, forestry, fisheries.

vi) issues in recreational activities and tourism

Measures to address:-

i) Ø convention of biodiversity (CBD) and Aichi targets case - IAS

ii) Global invasive species program to support CBD

iii) IUCN → ~~expert~~ specialist group → facilitate the exchange of information and knowledge to ensure linkage with policy making.

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iv) Border control measures such as screening routs of transmission of these spcies

v) SDG 15 also cover IAS.

According to IUCN, 5-25% alien spcies turn invasive.

Proper analysis and then eradication in a phased manner with native plantation is essential to preserve already threatened biodiversity and maintain ecological equilibrium.

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7. What is Environment Impact Assessment? Identifying the different processes involved in the exercise, highlight the purpose of carrying out this assessment. Further, mention in brief the status of EIA in India.

पर्यावरण प्रभाव मूल्यांकन (EIA) क्या है? इस कवायद में सम्मिलित विभिन्न प्रक्रियाओं की पहचान करते हुए, इस मूल्यांकन को पूरा करने के उद्देश्यों पर प्रकाश डालिए। इसके अतिरिक्त, भारत में EIA की स्थिति का संक्षेप में उल्लेख कीजिए।

Mandated under environment protection act, 1986 – EIA aims to predict and mitigate environmental impact of any development project.

Process :-

i) Screening :- whether EIA is needed

ii) scoping :- which areas & impact should be considered

iii) Main EIA :- prediction → evaluation

↓

summary & ~~mitigation~~ mitigation

iv) submit to CPCB → Public hearing

→ gets an NOC

v) MoEFCC's impact assessment authority

→ gives final clearance.

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Purpose:-

i) to balance developmental needs with environmental concerns

ii) ensure local participation

iii) ~~proper~~ continuous monitoring and evaluation to ensure accountability.

iv) to own all base line data to prevent any contingency.

Status of EIA

- Has brought a paradigm change
- focus on sustainability, participation, accountability
- issues with quality → Project proponent has the primary responsibility to fund the EIA - conflict of interest
- lack of proper data collection
- lack of expertise from various field

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such as social scientist and anthropologists in the expert panel.

- arbitrarily chosen consultants
- delayed public hearing with low participation (e.g. for shoal)

e.g. recently SC stopped work of BMC along the beach as the EIA was not conducted with due process.

EIA is an effective tool to ensure sustainable growth. It should be implemented properly.

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8. What is Climate Smart Agriculture (CSA)? Highlighting the need for adopting CSA, mention some of its key characteristics.

जलवायु स्मार्ट कृषि (CSA) क्या है? CSA अपनाने की आवश्यकता पर प्रकाश डालते हुए, इसकी कुछ प्रमुख विशेषताओं का उल्लेख कीजिए।

Food and agricultural organisation (FAO) defines CSA as agriculture which absorbs greenhouse gases, increase yield and productivity, is not vulnerable to climate change thus leading to food security and sustainable development.

Need for adopting CSA :-

i) Rising population :- more demand by 2050, 70% more food will need to be produced globally

ii) vulnerability of agriculture :- especially in developing countries where it is rain fed

Economic survey → farmers' income will reduce by 5-14% due to change in temperature, precipitation

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iii) Yield :- has levelled off / is declining.

iv) emerging challenges :- Pests, weeds, declining biodiversity (monocropping)

v) Entire food value - from crop production, cattle, processing, transport → contributed to 1/3rd of total CO_2 emission.

vi) Agriculture can become net absorber of CO_2 if done properly

vii) need to increase farmers' income.

(key characteristics)

i) Participatory - takes every stakeholder viewpoint into account → to arrive at a strategy.

ii) prevents uncoordinated and competing land use → Adopts a landscape approach → integrated planning and management.

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iii) has multiple entry points at different levels :-
development of technology, use of ICT, insurance scheme, value chain, strengthening of institutions, enabling policy environment.

iv) ~~engaging~~ engages women and marginal groups.

Thus there is need for agriculture that is more productive, resilient and mitigates CO_2 GHG emission rather than contribute to it.

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9. Enumerate the key factors responsible for bad air quality in Indian cities. Also, explain the significant aspects of the Air Quality Index launched in 2014.

भारतीय शहरों में वायु की खराब गुणवत्ता के लिए उत्तरदायी प्रमुख कारकों को सूचीबद्ध कीजिए। साथ ही, 2014 में आरंभ किए गए वायु गुणवत्ता सूचकांक के महत्वपूर्ण पहलुओं की व्याख्या कीजिए।

WHO's global air report → India 14 out of 15 most polluted cities in the world are Indian.

key factors responsible :-

(i) Population pressure - rising number of vehicles

(ii) Poor compliance with regulation -

(a) location of industries, power plants → poor compliance with emission norms

(b) poor public transport, no last mile connectivity, congestion on roads (leading to enhanced transit time. e.g. in mumbai - takes 65% more time to travel due to traffic), quality of engines in vehicles.

(iii) indoor air pollution - 22-50 % of ambient air pollution

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iv) unplanned urbanization

v) lack of trees, green spaces, natural wet lands.

vi) surrounding areas - stubble burning in (in Punjab Haryana) Delhi NCR

vii) construction, unpaved roads, mining.

Aspects of Air quality index launched in 2014:-

i) meant to display air quality in easily understandable colour coded form based on underlying parameters such as NO_x, SO_x, CO, O_3, $PM_{2.5}$ PM_{10} NH_3 and Pb. (total 8 pollutants)

ii) based on national ambient air quality standards (NAAQS)

iii) Total 6 AQI categories based on standards and likely health impact.

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Proper monitoring is the first step towards ensuring accountability of all stakeholders in ensuring good air quality for citizens of India.

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10. Write short notes on the following terms:
निम्नलिखित पदावलियों पर संक्षिप्त टिप्पणी लिखिए:

(a) Hazard and Disaster
संकट और आपदा

Hazard → Natural (or man made) phenomenon that has the potential to damage life, property, environment.

Disaster → when damage due to hazard exceeds the coping capacity of society using its local resources, its called a disaster.

Hazards are unavoidable for e.g. earthquake Tsunami, cyclones, variations in rainfalls

Hazards are converted to disasters based on the vulnerability of the population which depends on :-

Underlying factors causes	dynamic pressure	unsafe conditions
- Poverty	- lack of institutional strength	- dangerous location

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- physical disability → poor access to resource	skill, education, training - unplanned urbanization - environmental degradation	- poor infrastructure - unsafe building.

The main purpose of disaster management is to prevent hazards from converting into disaster by reducing vulnerability

10. (b) Disaster Risk and Vulnerability
आपदा जोखिम और सुभेद्यता

Risk posed by a disaster depends on its severity, vulnerability of underlying population, preparedness of community and institutions, ability to respond, and recover and rehabilitate.
Risk = Hazard X vulnerability
There is a need of understanding risk by scientific analysis of natural/man made hazards - area at risk - their (hazard zonation mapping)

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Vulnerability - of population
- of infrastructure
- of institutions

and then taking steps to mitigate them by structural / non structural methods.

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11. What are the characteristic features of coral reef ecosystems? Highlighting their importance, identify some of the threats being faced by them.

प्रवाल भित्ति पारिस्थितिक तंत्र की विशिष्ट विशेषताएं क्या हैं? उनके महत्व पर प्रकाश डालते हुए, उनके द्वारा सामना किए जा रहे कुछ खतरों की पहचान कीजिए।

Coral reef — Colonies of coral polyps held together by calcium carbonate.

They occur in symbiotic relation with one-celled algae (zooxanthelle)

Coral → provide shelter ; algae → photosynthesis (food)

They occure in shallow, clear, oxygenated, warm waters in tropical ocean.

Importance :-

i) Rainforests of ocean - 0.1% of world's ocean area - 25% of all marine species

ii) ecosystem service - tourism, fishery shoreline protection, biotechnology

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Threat :-

I) excess nutrients - (harmful to corals) from agricultural runoff, sewage, effluents → cause algal blooms → block sunlight

II) Ocean acidification - due to increase CO_2 absorption by ocean

III) temperature - rising sea temperature. corals require 26-28°C water

IV) chemicals - e.g sunscreen, paints

V) over fishing - e.g bottom trawling, ballast fishing

VI) disease - virus

Massive coral bleaching → expulsion of zooxanthellae occurs under these conditions → corals become growth stunted, vulnerable to disease → finally die.

Given their ~~co~~ ecological and economic significance it is essential to

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preserve them.

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12. Explain the concepts of Bio-magnification and Bio-accumulation. Also, provide examples of the harmful impact of these two processes on the environment and human health.

जैव-आवर्धन और जैव-संचयन की अवधारणाओं की व्याख्या कीजिए। साथ ही, पर्यावरण और मानव स्वास्थ्य पर इन दोनों प्रक्रियाओं के हानिकारक प्रभावों का उदाहरण प्रस्तुत कीजिए।

Bio accumulation - accumulation of chemicals in fatty tissue of living organism and their concentration. e.g DDT gets accumulated in fish from river water

Bio magnification - rising concentration of chemicals (as a percentage of body weight) with rising level in food chain. for : DDT → fish (1·1) → DDT → hawk (10·1·)

Properties → non degradable, mobile, lipid soluble and biologically active

Harmful impact :-

① Threat to biodiversity :- chemicals from plastic, fertilizers, industrial

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effluents eg - DDT, bisphenol A etc gets accumulated in marine organisms during reproduction → causes disease, and death

(11) threat to health - humans consume animal based food further magnification → disease eg Minamata disease (from mercury), cancers from polyaromatic hydrocarbons (PAH), heavy metal poisoning etc.

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13. Identify and explain the importance of key elements of action in disaster management cycle during the post-disaster phase.
आपदा पश्चात चरण के दौरान आपदा प्रबंधन चक्र में कार्रवाही के प्रमुख तत्वों के महत्व की पहचान और व्याख्या कीजिए।

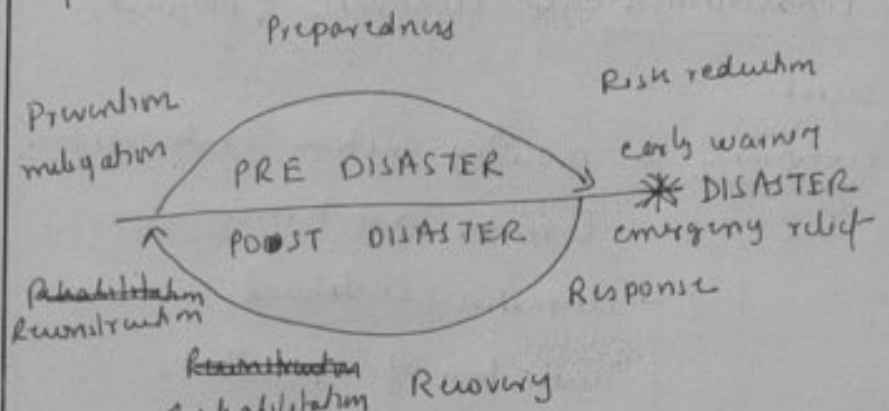

fig :- Disaster management cycle

1) Emergency response and relief :-

(a) immediate search and rescue, evacuation are essential

(b) providing immediate medical assistance

(c) provision of food, shelter, water, sanitation provision

(d) importance - reduce damage to life and health

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② Recovery – from psychological trauma by proper counselling

③ Rehabilitation – economic, physical, social

economic – providing one time cash assistance, loan on easy term
- alternative livelihood
- restoration of agriculture, small business

social – access education
– rehabilitate destitute women and children in family like environment-
- shelter, training
- shelter homes

Physical – as close as to original residence
- avoid secondary displacement

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This is essential to start normal life and economy at the earliest and prevent long term damage.

④ Reconstruction :— on the principle of build back better
- include standard codes and practices (e.g flood proofing, BIS codes for earthquake resilient building and infra structure)
- Sustainable livelihood. reduces

Most essential as it ~~reduces~~ the vulnerability and enhances preparedness for future hazards.

Post disaster ~~management~~ actions are an essential facet to minimise damage and enhance future resilience.

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14. Drought may be caused by natural factors but it is turned into a disaster by human induced factors. Discuss.

सूखा प्राकृतिक कारकों से पड़ सकता है, लेकिन यह मानव प्रेरित कारकों से एक आपदा में परिवर्तित हो जाता है। चर्चा कीजिए।

Drought is deficiency of rainfall from its normal pattern in aregion for an extended period of time leading to general suffering in society. Vanation is rainfall is a natural phenomenon (more so for Indian monsoons). Thus meteorological drought is caused by natural factors. It turns into a disaster when it converts into hydrological drought (water resources) and agricultural drought (affecting crops, ~~cat~~ livestock).

Human induced factors that turns drought into disaster :-

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① Enhanced vulnerability -
- rainfed agriculture - ~~overwhelming~~
- overwhelming dependence on agriculture
- social and economic inequity

② faulty practices -
ⓐ poor water management
- monocropping, water guzzling crops (sugarcane in marathwada)

ⓑ poor prioritisation
- power plants in water-shortage areas, beer industry in maharashtra (when horticulture is dying)
- no rainwater harvesting, dependence on groundwater, to natural waterbodies drying up due to encroachment, traditional methods of irrigation (tanks) out of use

③ Deforestation, over grazing, environmental degradation - more erratic rainfall, increased land degradation, desertification

All these factors have significantly

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increased the vulnerability of population to drought threatening food security and social stability. It is important to check this deforestation and implement suitable practices to improve resilience.

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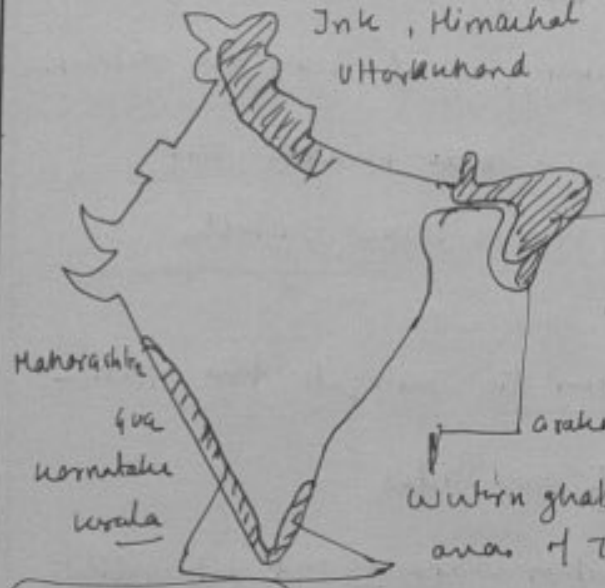
15. Identify the areas affected by and the causes of landslides in India. Mention different steps that need to be taken to mitigate the effects of landslides.
भारत में भूस्खलन से प्रभावित क्षेत्रों और इसके कारणों की पहचान कीजिए। भूस्खलन का प्रभाव कम करने के लिए उठाए जा सकने वाले विभिन्न कदमों का उल्लेख कीजिए।

Around 14% of India's total land area is prone to landslide (downward movement of land/rock due to gravity)

J&K, Himachal Pradesh, Uttarakhand



entire north east region especially Assam

Maharashtra, Goa, Karnataka, Kerala

Aravalli mountain, Western ghats and some area of Tamil Nadu

Natural causes :-
In Northern and N-E - Young mountains
- rivers
- high seismicity

Western ghats and Nilgiris - heavy rainfall
- steep slopes

Anthropogenic :- Unloading of mass from slope for construction

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- overloading of slope due to built up construction
- undercutting of slope
- drawdown of large amount of water from valley below
- heavy machinery, road, railways construction
- deforestation - increases soil saturation, makes slope unstable

Steps to be taken to mitigate the effects:-

(1) Inventory of landslides

(2) Hazard zonation mapping and vulnerability analysis on area based approach

(3) Early warning and forecast at selected high risk areas e.g. Real time landslide warning system in Sikkim and Darjeeling.

(4) slope stabilisation - Afforestation
- removal of debris from slope
- improving surface and subsurface

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drainage
- nailing, bolting, anchoring, tie back,
- geo grid, geotextiles

(5) Regulation of human settlements in land slide prone areas

(6) enforcement of Building codes, land use bye laws and Urban plans.

(7) mitigation of Efforts of land slide damage by warning and evacuation

(8) awareness generation, training, capacity building of all stake holders - especially community (1st responders)

(9) more research into - geological and geotechnical processes, early warning system etc

(10) Proper response through incident command system via emergency operation system
- early search and evacuation
- coordinated rapons.

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16. Highlight the reasons which make coastal regions particularly susceptible to climate change. What steps have been taken by the government of India to address the same?

उन कारणों पर प्रकाश डालिए जो तटीय क्षेत्रों को विशेष रूप से जलवायु परिवर्तन के प्रति अतिसंवेदनशील बनाते हैं। इसे संबोधित करने के लिए भारत सरकार द्वारा क्या कदम उठाए गए हैं?

Coastal regions in India accomodate 160 million population. These are particularly susceptible to climate change due to :-

i) Proximity to ocean — sea level rise due to rising temperature and thermal expansion of water will directly effect these areas

ii) Dependence on ocean resources such as fishery, tourism industry and port led development — These are hampered due to climate change.

iii) Disasters such as cyclones, tsunami

iv) Surface water, ground water both susceptible to contamination, salinity ingress

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v) High density population and critical infrastructure such as oil wells, refineries, nuclear power plants in these areas

vi) ~~Re~~ Loss of natural protective mechanisms

Steps taken by government of India

i) Coastal ~~zone~~ regulation zones, guidelines
- flexible approach with decentralisation

ii) NDMA guidelines for disaster
- effective in Odisha (Cyclone Fani)
- Early warning system

iii) Preservation and expansion of mangroves, coastal belt plantation, bioshields, wetlands, coral reefs

iv) construction of saline embankments, sea walls, dune reconstruction, rehabilitation

v) ~~mainte~~ construction and maintenance of infrastructure - roads, power, communication lines

vi) Integrated coastal zone management project

vii) Blue flag beach certification

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Thus government is acting to holistically address challenges along with ensuring development in tribal areas.

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17. What are the causes of forest fires and their effects on the ecosystem? How can forest fires be prevented? Also mention the steps that have been taken by the government in this regard.

दावानल (जंगल की आग) के कारण और पारिस्थितिक तंत्र पर उसके प्रभाव क्या हैं? दावानल को किस प्रकार रोका जा सकता है? साथ ही, इस संबंध में सरकार द्वारा उठाए गए कदमों का भी उल्लेख कीजिए।

Almost 65% of recorded forest area in India is susuptible to forest fires. There have been increasing in frequency, intensity and severity.

Causes – i) Natural phenomenon which aids in regeneration – causes- friction, lightening

ii) human – cigarettes, bonfires, jhum cultivation etc start frequent fires

iii) forest degradation, replacement of natural forest with plantation which burn severely (chir pine), invasive alien species such as Lantana camara

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~~To prev~~ There is no need to have zero forest fire policy. Rather, ~~they~~ forests should be properly managed to prevent intentional / unintentional fires and reduce their intensity.

i) Clearing of forest floor and undergrowth

- chemically, biologically, mechanically

ii) creation of ditches (fire line) to prevent spread of fire

iii) removal of invasive alien species such as eucalyptus from western ghats, lantana camara from forest flours ch

iv) ~~card~~ monitoring, early warning and effective response - use of remote sensing ground patrolling

v) Prevent encroachment on forest land

vi) community involvement in prevention and management.

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measures by government

i) creation of fire line

ii) creation of water harvesting structure

iii) forest fire prevention and management scheme (FFPMS)

iv) MoEFCC - national plan for forest fire control

v) International coordination - information from NASA satellites

vi) Training of forest department officials.

There is a need to improve quality of forests by joint forest management and thus holistically prevent fires and other disasters.

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18. Discuss the reasons and implications of land degradation and desertification as major environmental challenges facing India. Suggest the measures needed to address them.
भारत द्वारा सामना की जा रही प्रमुख पर्यावरणीय चुनौतियों के रूप में भू-निम्नीकरण और मरुस्थलीकरण के कारणों और निहितार्थों की चर्चा कीजिए। उनसे निपटने के लिए आवश्यक उपायों का सुझाव दीजिए।

Land degradation i.e deteriorating quality of land and desertification i.e land degradation in arid / semi arid regions have emerged as major environmental challenges facing India.

Reasons :-

(i) Deforestation

(ii) soil erosion due to over cultivation, faulty cultivation techniques, overgrazing

(iii) excessive use of chemicals in agriculture

(iv) water erosion - due to loss of vegetation cover

(v) salinity - due to flood irrigation techniques

(vi) mining, unplanned urbanization and other land use change.

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(implications)

- 30% of India's land area is degraded and 1.8 million hectare is desertified. leading to economic, ecological and social adverse effects.
- → declining crop productivity due to loss of top soil, declining water holding capacity, declining organic content and porosity
- → siltation of ~~rivers~~ rivers → worsening flood situation
- → ~~micro~~ ~~complemented~~ ~~[illegible]~~
- → affects soil micro fauna and flora
- → affects terrestrial and aquatic biodiversity by loss of habitat
- → contributes to green house gas emission by unlocking stored carbon.
- → air pollution – dust storms

Measures :– Land degradation neutrality is one of the ~~goals~~. SDG.

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(I) Agriculture – intercropping, mixed cropping, mulching – precision irrigation – ridge and furrow irrigation, contour bunding – agroforestry

– terrace farming – organic farming
– stop shifting cultivation

(II) Afforestation

(III) Sustainable grazing, pasture and forage crop improvement, silvo pastoral management.

(IV) Desert control – grazing, fencing etc

(V) Involving local community

Land is a valuable and non renewable resource. It is essential to prevent land degradation and desertification by undertaking sustainable practices.

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