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R N 01 OCT 2019 NO. 03

GENERAL STUDIES (TEST CODE : 1396)

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Medium Eng./Hindi	English	Registration Number	523359
Center	ORN	Date	1.10.2019

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).
2. There are **TWENTY** questions printed in **ENGLISH**
3. **All questions are compulsory.**
4. The number of marks carried by a question/part is indicated against it.
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.
6. Word limit in questions, if specified, should be adhered to.
7. Any page or portion of the page left blank in the Question-Cum-Answer Booklet must be clearly struck off.

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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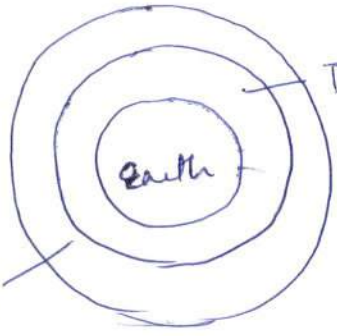
Answer all the questions in NOT MORE THAN 200 WORDS each. Content of the answers is more important than its length. All questions carry equal marks.
12.5X20=250

1. Differentiating between good and bad ozone, write a brief note on ozone pollution. Also, highlight the initiatives taken to mitigate ozone pollution.

Ozone is a secondary pollutant which is formed by the reaction of nitrogen oxide, volatile organic compounds, etc. chemically. Ozone can be categorised into two - good and bad ozone.



Troposphere - BAD OZONE
It is very harmful and pollutes the environment as a Greenhouse gas.

Stratosphere
GOOD OZONE -
It protects the Earth from the harmful ultraviolet radiation and also helps in saving the effect of it.

The ozone in the troposphere causes air pollution and has effect -

(i) On Humans - the ultraviolet radiation absorbed by human body leads to

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diseases like skin cancer, respiratory problems.

(ii) On Vegetation - leads to discolouration, loss in herbaceous plants, loss of feeder stock.

(iii) On Materials - ozone when contributes in acid rain may lead to corrosion of buildings, cracking of ~~tire~~ rubber, etc.

~~(iv)~~ Thus, ozone when in troposphere creates innumerable harmful effects. To tackle the ozone pollution various initiatives are taken —

(i) INTERNATIONAL INITIATIVES:

(a) Gothenburg Protocol - which lays down for abatement of eutrophication, ground level ozone and acidification.

(b) Vienna Convention and Montreal Protocol to phase out the CFCs in order to save the depleting ozone in the stratosphere.

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(c) Kigali Agreement of Vienna Convention to phase out hydrofluorocarbons.

(ii) NATIONAL INITIATIVES:

(a) SAFAR - System of Air Quality and Weather Forecasting - includes monitoring of ozone as a pollutant in order to reduce the PM 10 and PM 2.5 levels.

(b) National Ambient Quality of Air Standards also incorporates ozone as a pollutant to be monitored and reduced.

(c) Air Quality Index in 14 cities includes Ozone.

(d) Graded Response Action Plan of Delhi-NCR to curb pollution also aims to reduce ozone pollution.

Thus, in order to save from harmful effects of ozone pollution, it is essential to reduce the bad ozone and save the good ozone in the stratosphere from depletion.

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2. Give an account of land degradation in India. Also, highlight the steps taken to check growing land degradation in India.

India accounts for 30% of ~~degraged~~ degraded land.

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3. Discuss the role of media in disaster management in India.

Communication and information dissemination is highly required for all phases in disaster management and media has a great role in it to provide leadership for a disaster resilience.

Role of Media

- PRE DISASTER
- DURING DISASTER
- POST DISASTER

Pre-disaster:

(i) To make Government redefine the priority for expenditure on disaster management (DM) by exposing the inefficiencies in expenditure.

(ii) To be a part in preparedness plans
Example - for information dissemination to public at large through TV, SMS, newspapers, etc.

(iii) For capacity building and awareness generation.

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During disaster:

(i) To maintain the calmness and prevent panic

(ii) To give correct facts to the volunteer organisations, politicians for better reach of victims.

(iii) To inform about the extent of disaster internationally.

(iv) To make the victims safe by informing about the blocked lanes & passages.

Post disaster:

(i) To help the victims meet their closed ones

(ii) Raise material resources and funding for the ~~vict~~ disaster struck victims.

~~(iii) To~~ Media must cooperate with the Government while telecasting the disaster and its extent. Though, the media has highly positive role to play, it has certain negative roles -

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(i) Biased and sensationalism may creep in by the media during disasters.

(ii) Live coverage of counter-terror operations led to loss in strategy eg - 26/11 Mumbai attacks.

(iii) A great footage to politicians if seen during the disaster.

Hence, Media must be regulated and should cooperate during all phases of disaster for better mitigation, preparedness, response and relief. Media has a immense role to make a country disaster resilient.

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4. Write a brief note on Joint Forest Management and its significance. Examine the reasons behind its limited success in India.

Joint Forest Management (JFM) is managing the landscape of forests with involvement of and participation of local communities.

It JFM is like a cultural mode of conservation as the rights of indigenous communities is respected and they are greatly involved in managing the forests and the biodiversity together.

Examples include - The Chenchus of Andhra Pradesh succeeded in conservation of forests and for; Idu Mishmi tribe for conservation of tiger landscape.

Significance of JFM:

(i) JFM leads to better cooperation between forest officials and the local communities. This leads to better coordination during times of forest fires.

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(ii) The knowledge of indigenous community can be taken well into account as they will be in a happy position to share due to the respect and involvement.

(iii) Less conflicts among various groups of forest officials and groups.

(iv) Increased biodiversity and conservation of forests.

(v) Less incidences of forest fires

(vi) Good livelihood opportunities and employment for the forest dwellers.

Though, JFM holds various benefits, its limited success due to -

(i) Colonial mode of conservation - The communities are looked down upon as harming the forests usually and are not encouraged to participate or are rather evicted from land.

(ii) The uncooperative attitude of forest officials.

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(iii) Lack of training and capacity building measures to sensitise the forest officials regarding local communities.

(iv) Use of force rather than persuasion makes the local communities always suspicious about the JFM and the mindset towards forest officials remains authoritarian.

(v) Lack of acceptance of various tribes for this mode of conservation.

(vi) Hence, JFM is a watershed conservation measure for protected areas and measures like capacity building measures must be sought in order to use the potential of communities.

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5. What are various techniques of recovering energy from waste? Highlight the potential and challenges associated with Waste to Energy plants in India.

Waste to Energy (WTE) is to harness electricity and energy from the various types of waste generated. It is a cleaner ~~and~~ and useful way to utilise the waste of the large landfills.

Techniques of recovering energy from waste:

(i) Incineration - this involves burning of waste at high temperatures in incinerators.

(ii) Pyrolysis - It is the decomposition of Materials at elevated temperatures in an inert atmosphere i.e. absence of oxygen.

(iii) Gasification - in the presence of oxygen at elevated temperatures.

Potential of Waste to Energy -

India has the potential to generate more than 600 MW of energy through this technology. According to a study, by CSE, the waste to energy plants are lying defunct. However it has a lot of potentialas-

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(i) Less ~~co~~ emission of greenhouse gases and is thus cleaner.

(ii) Reduced landfills and pile of waste generated

(iii) 24x7 electricity unlike solar and wind.

(iv) Coprocessing of energy – better and less power cuts in industries.

(v) Utilise the waste through conversion into energy due to energy deficit.

(vi) Promote in energy diversification basket

(vii) Help India achieve reduction of its carbon emissions of 33-35% of GDP by 2030.

Despite the potential, various bottlenecks exist –

(i) Low calorific value – India generates waste without proper segregation. Thus, a lot of wet waste and moisture leads to low calorific value.

(ii) Expensive – A solar and wind energy electricity would cost Rs3-4 kw/ whereas WTE

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would cost Rs 7-8 kwh, making it expensive.

(iii) Lack of finance mechanism for urban local bodies.

(iv) Toxic waste - High toxic waste obstructs the process of conversion and creates the menace of pollution.

Therefore, it is essential to utilise the potential of WTE for providing power to all. The suggestions from NITI Aayog 3 year Action Agenda must be taken to account and waste to Energy Corporation must be established for better utilisation of potential.

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6. A disaster is the combined effect of hazard and vulnerability. Elaborate with suitable examples.

Disaster is an event led by a natural hazard and the lack of risk capacity to handle the hazard.

Examples

(i) kerala floods - Flood was a natural hazard but was accentuated into a disaster due to man-made factors and vulnerability like dam mismanagement, illegal quarrying, etc.

(ii) Uttarakhand floods of 2013 - Though a hazard, in terms of cloudburst was exacerbated into a disaster due to the rising population and developmental activities in that area.

(iii) chennai floods - due to lack of proper drainage and poor urban planning.

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(iv) Odisha cyclone of 1999 - vulnerability physically due to lack of preparedness and mitigation plans.

(v) Industrial disaster like the Bhopal Gas tragedy turned into chemical disaster due to leakage of gas and proper norms not followed.

With better preparedness and mitigation plans, a disaster can be saved.
For example - the recent cyclones in Odisha i.e. Fani, a category IV storm led to few casualties only as there was a proper management in action.

Hence, disaster is mainly exacerbated with lack of knowledge and vulnerability- A hazard can turn into a disaster with lack of capacity and vulnerability.

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7. Highlight the factors responsible for loss of biodiversity in recent times. In this regard, also mention the steps that have been taken for conservation of biodiversity.

Biodiversity encompasses flora and fauna. It provides ecosystem services and are essential component of nature.

During recent times, there have been tremendous loss of biodiversity. Factors responsible:

(i) Climate change - leading to extreme weather events causing extinction and dwindling of many species.

(ii) Pollution - causing loss of biodiversity of various marine and river organisms due to plastic and river pollution.

(iii) Deforestation - indiscriminate felling of trees leading to loss of microorganisms, soil erosion. loss of vegetation.

(iv) Agriculture surface runoff - with fertilisers, pesticides causing excessive nutrients and depleting oxygen levels due to eutrophication.

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(v) Ocean Acidification - leading to loss of corals and bleaching.

(vi) Loss of habitat and fragmentation of land due to shift to agriculture to the forests, wetlands, overgrazing etc.

Hence, measures need to be taken to support biodiversity by -

(i) Increasing protected areas of various species

(ii) Joint Forest Management by involving local communities.

(iii) Following cultural mode of conservation

(iv) Establishing various conservation and community reserves.

(v) Reduction of Greenhouse gases through shifting to renewable energy.

(vi) Restoring patches of sacred groves.

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Therefore, it is necessary to support biodiversity by inculcating various conservation measures.

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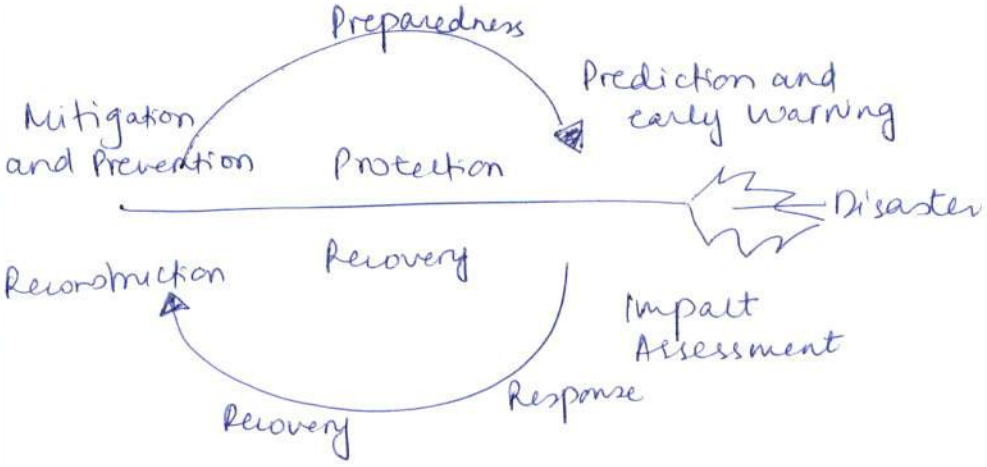
8. Elaborate on the different phases of the disaster risk management cycle.

Disaster Risk Management Cycle ensures that the disasters are managed effectively and every facet of disaster is addressed.

Disaster Risk Management cycle



Pre-disaster cycle

→ Preparedness involves - creation of a disaster resilient infrastructure and a prepared community in terms of training of what to do during a disaster.

→ Prediction & early warning - also helps

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to prepare for a disaster and helps in mitigating and preventing large loss due to an early warning.

→ Mitigation involves the measures taken to reduce the impact of a disaster when it arises.

(iii) Post disaster cycle involves:

→ Impact Assessment - in order to know the extent of disaster in terms of lost lives, loss of infrastructure, livelihood, employment.

→ Response - to the disaster by providing first aid, food supplies, medical facilities, shelters, etc.

→ Recovery - involves the phase of recovering from the disaster. It involves various rehabilitation measures including physical, social, psychological rehabilitation.

→ Reconstruction - to build back better

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the infrastructure lost, etc. and help to further prevent a disaster from its ~~root~~ reoccurence.

Thus, disaster management cycle shift approach from a relief centric to a pro-active holistic disaster preparedness approach.

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9. In context of waste management, what do you understand by Extended Producer Responsibility? Mention the challenges in ensuring its compliance in India.

Extended Producer Responsibility (EPR) in waste management is extending the responsibility of managing waste to the one who produces it in the first place i.e. the producer of the commodity / waste.

In India, it has been extended in the e-waste management rules and plastic management rules. It places the onus of responsibility to the producers to ~~generat~~ collect the waste generated, dispose them or recycle them.

Example: In e-waste management rules the producer has to take back the electronic equipment from the consumer for its disposal. A deposit refund scheme is initiated in order to push consumer to return.

Significance of EPR:

1) Scientific disposal of waste

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(2) Reduction in the various forms of pollution

(3) Less toxic waste in the landfills.

However, EPR faces certain challenges:

(i) Lack of targets - no targets in place for the producers to collect back the waste.

(ii) Violation of rules - the rules are violated very frequently

(iii) Lack of incentives for the producers

(iv) Producers consider it as an additional burden to focus upon.

(v) Expensive - It makes it costly on the part of producers to collect, dispose and recycle.

Hence, though a good practice as followed by Nokia (Planet rakhwale and take it back campaign) and Green warriors of Telangana, it must be

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incentivised in order to promote their responsibility. Private sectors must consider as their social responsibility and ensure a sustainable society.

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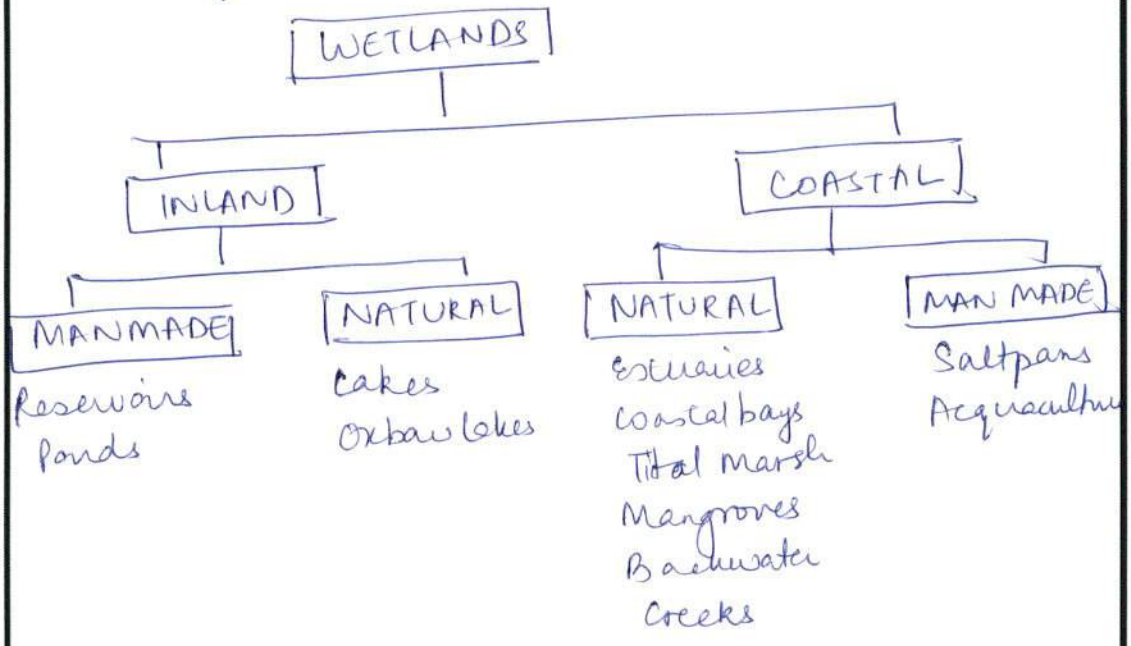
10. What are wetlands? Accounting for the reasons behind the disappearance of wetlands, suggest some measures which can be taken for their effective conservation.

Wetlands are areas transition in character i.e. between terrestrial and aquatic ecosystems. They are mainly waterlogged and have hydric soils.



Wetlands are highly essential as they regulate waterflow, mitigate floods, purify and recharge aquifers, nutrient recycling, etc.

Reasons for their disappearence:

i) Human-induced developments leading

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to conversion of wetlands for housing and non-agriculture purposes. Eg - 40% of mangroves in Gujarat are lost due to housing and non-agriculture projects.

(ii) Overgrazing by cattle

(iii) Encroachment of wetlands for agricultural purposes.

(iv) Illegal fishing leading to depletion of various marine population.

(v) Pollution - water, ground and soil pollution leading to their disappearance due to harmful metals, fertilisers, etc.

(vi) Shrimp fishing and aquaculture practices.

(vii) Deforestation - leading to loosening of soil structure and loss of vegetation.

Measures for effective conservation:

(i) Enforcement of rules and laws - to prevent the development activities in areas of threat. For example - enforcement of CRZ regulations leading to the demolition of flats build near the ~~river~~ Vembanad Lake.

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(ii) Promoting growth of soil bind grasses

(iii) Awareness generation for the use of wetlands and their depletion to induce a grassroot movement.

(iv) Riparian buffers must be created to save the wetlands from harmful fertilisers.

(v) Involvement of local bodies and funds for them to monitor the regulation.

(vi) Hence, wetlands are in rising threat of destruction. For a sustainable environment, measures should be taken for their conservation as they are highly productive ecosystems.

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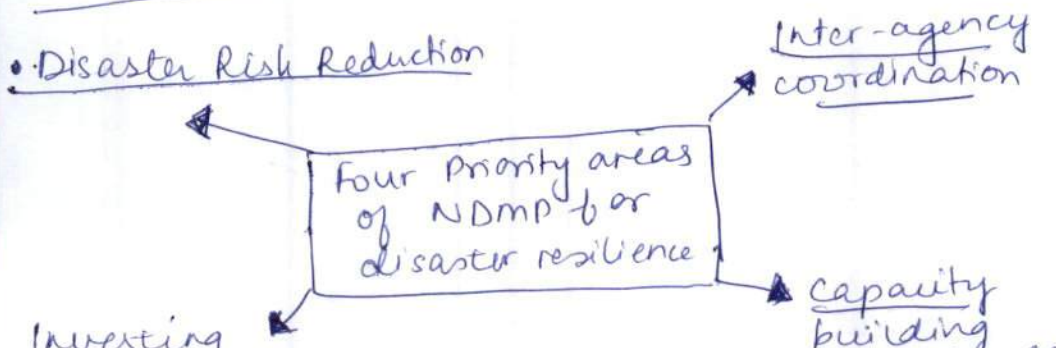
11. How does the National Disaster Management Plan (2016) aim to make India disaster resilient?

National Disaster Magement Plan aims to make disaster resilient India by integrating the plan with Sendai Framework, Paris Agreement and sustainable development goals.

How it aims? -



- Integration - NDMP aims at vertical and horizontal integration of roles for disaster resilience.
- Defines Activities - like information dissemination, relief, response measures
- Role of Media - It also inculcates media

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in its plan and aims to regulate it through various measures.

- It provides a flexible action plan for all disasters to all the agencies for disaster management.
- Inclusion of technology for resilience in its structural measure like use of drones, GPS, satellite imaging, etc.
- Capacity building measures to create a repository of knowledge and institutions for training, ~~workshops~~ workshops to inculcate the preparedness and mitigation plans.
- Inclusion of disaster management in all sectors and developmental activities.
- "To build back better" after disaster during the recovery and reconstruction phase.

Hence, the NDMP plan lays a roadmap to prepare India for

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disaster resilience infrastructure and society. However, it needs to be supplemented with various plans with clear cut targets in order to handle the disaster effectively.

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12. Highlight the reasons behind frequent occurrence of floods in India. Also, mention the NDMA guidelines for management of floods.

In India, more than 40 million hectares of land is prone to floods. There have been recent occurances of floods & urban floods in states of Assam, Bihar, karnataka, kerala, chennai, Mumbai, etc.

Reasons behind frequent occurrence:

(i) Extreme weather events - due to climate change has led to drought and flood at the same time.

(ii) High amount of rainfall received at one go and improper forecasting

(iii) Dam mismanagement - The recent floods of kerala can be traced to this reason as ~~man~~ dams were mismanaged and led to floods. (eg - Idukki dam)

(iv) Developmental activities like construction in the high tide areas, quarrying, illegal mining trigger landslides and floods.

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(v) Drainage - Many drains are choked due to the waste leading to insufficient drainage and diversion of water.

Floods lead to havoc and create huge loss in terms of lives lost, damage to infrastructure, loss of livelihoods and employment.

NDMA has praided certain guidelines for management of floods:

- STRUCTURAL
- NON-STRUCTURAL

Structural Measures:

(i) Adequate silting through desilting and dredging measures

(ii) Creation of flood banks, flood levies and embankments to mitigate the floods.

(iii) Diversion of water - eg. supplementary drain in Delhi, ~~the flood system~~

(iv) Proper drainage channels for water

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to flow easily.

Non-structural measures:

(i) Flood zoning - identifying various areas into zones

(ii) Flood proofing of structures

(iii) Capacity building measures to reduce risks by providing training.

(iv) Flood mapping to identify the flood prone districts.

(v) Drawing up of district level plans for mitigation of floods.

Therefore, floods can be managed before it turns into a disaster.

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13. Assess the vulnerability of India's forests to forest fires and suggest measures to tackle it.

According to State of Forest Report, more than 50% of forests in India are prone to fires.

Vulnerability of India's forests to fires:

(i) Extreme heat events and climate change leading to fires.

(ii) Traditional methods like shifting cultivation induce fires.

(iii) Deforestation - the forests which binds the soil when removed for various activities leave the vegetative cover unprotected.

(iv) More than 95% of fires are man-made in India.

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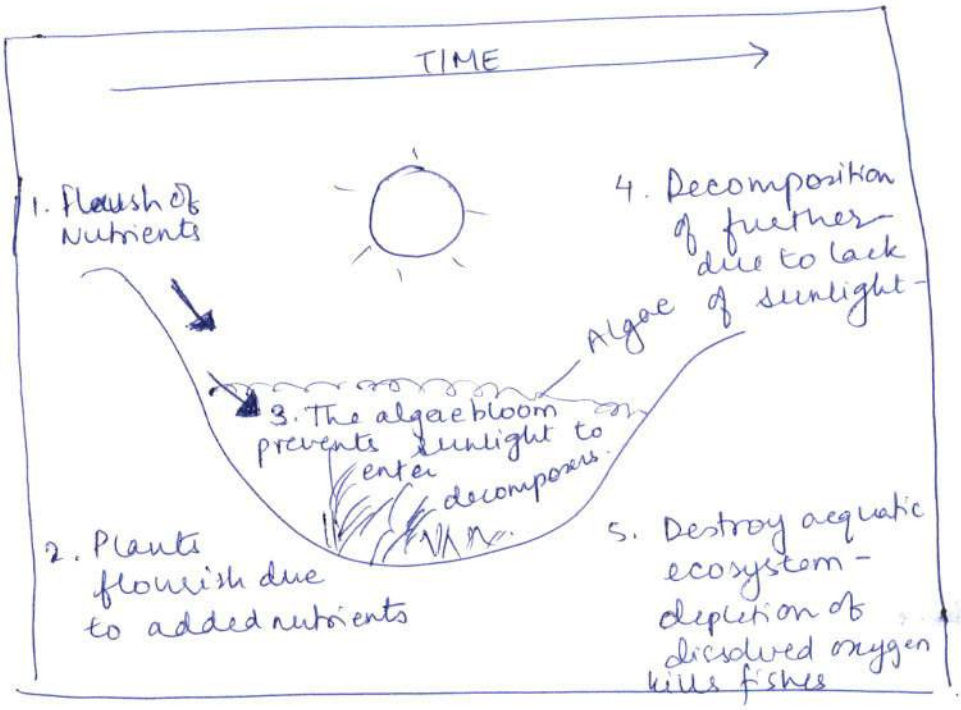
14. What is eutrophication? Highlighting its ecological consequences, suggest measures to tackle it.

Eutrophication is a syndrome of ecosystem i.e. response to addition of nutrients natural or artificial through agriculture runoff, fertilisers, etc.

It is a leading cause of algae bloom.



Ecological sequences

(1) Ecosystem -

- It leads to degradation of ecosystem by changing the aquatic ecosystem to terrestrial habitat.

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- The detritus layer preventing sunshine to enter promotes the growth of fungi
- kills acquatic organisms like fishes due to depleted oxygen level.

(2) Humans - the food consumed reaches in the human chain leading to bio magnification.

(3) Toxicity - The bloom releases certain toxins and dioxins leading to massive kills of marine organisms and reduction of growth in the food web.

~~(4) Other consequences~~

(4) Coral bleaching - It leads to destruction of the tropical rainforests coral reefs.

(5) Soil contamination

Thus, eutrophication may be naturally or culturally induced. The productivity is high but the creation of harmful algae blooms leads to various harmful consequences. The measures to tackle -

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(i) Riparian buffer – in order to concentrate the nitrates before it reaches the water.

(ii) Nitrogen testing and modelling

(iii) Efficient use of fertilisers through checking health of the soil

(iv) Integrated Pest Management to reduce the excessive use of pesticides and weedicides.

(v) Sustainable agriculture practices and climate smart to enhance the resilience. Example - Organic farming

(vi) Use of practices of micro irigation, dip and sprinkler method to prevent the agriculture surface runoff by over irrigation

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15. River pollution is a major environmental issue in India, which has far-reaching consequences. Discuss while enumerating the various sources of river pollution.

According to a CPCB report, India has 351 polluted river stretches; ~~of Indi~~ 42 rivers are critically polluted.

River pollution is a menace and has ~~far reaching consequences and sources~~ following sources:

~~(i) SOURCE - Domestic waste from households and sewage~~

SOURCES

- Point – can be traced
  - Agricultural surface runoff fertilisers, pesticides
  - Industry Chemicals Hot water
  - Households domestic kitchen waste and sewage
- Non-Point – cannot be traced

(i) Agricultural sources – harmful pesticides, insecticides, fertilisers are washed away and reach the river.

Consequence – These fertilisers leach.

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and cause river and groundwater pollution.

- Concentration of Nitrates rises which may reach the human body and cause blue baby syndrome.
- Eutrophication leading to harmful algae blooms.

(ii) Industry - The disposal of heavy metals, hot and cold water leads to changes in the chemistry of river. Extremely hot and cool sauce leads to thermal pollution and harms the aquatic system by reducing the dissolved oxygen and causing massive reduction in plankton production.
Also, metals like arsenic and cadmium cause harmful effects on human health, leading to black foot disease, neuro disorders, itai itai disease.

(iii) Household wastes and domestic sewage includes wet waste, e-waste,

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plastic, ~~etc~~ waste generated during festivals, etc

Consequence - ~~The~~

(a) The insegregation of waste creates problems and leads to large dumping of waste in the rivers.

(b) Waste generated during festivals like kumbh Mela in Ganga with various flowers, chemicals, agarbattis, etc. is harmful for the fishes and marine organisms.

(c) Plastic waste being dumped being ingressed by fishes leading to their deaths.

(d) Decrease in the quality of water leading to water borne diseases.

Thus, river pollution should be checked and a zero waste lifestyle should be adopted i.e. 4R2C - Rethink, Reduce, Reuse, Recycle and Compost to reduce the waste being dumped in rivers.

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16. India has witnessed increased instances of human-wildlife conflict in the recent years. Stating the reasons behind it, mention ways in which it can be averted.

The Ministry of Environment recently tabled in the Lok Sabha that more than 2250 deaths have occured due to elephants and 224 deaths claimed by tigers.

Other instances of conflict include Man-frog conflict in Andaman and Nicobar Islands. Tiger in Pilibhit Reserve, etc.

Reasons behind the Human Wildlife Conflict (HWC)

(i) Loss of habitat and fragmentation - due to various developmental activities like building roads, railway lines, etc. have encroached upon their land and this has led the animals to move into other areas.

(ii) Land use changes with construction of canals, riverbanks, irrigation providing productive forage to animals like elephants.

(iii) Increase in the population - Various

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ungulates like blackbuck which were earlier dwindling have increased in population. This has created conflict in North west and central India.

(iv) Outside the protected areas - More than 29% of tigers are outside protected areas.

(v) Extreme weather events like droughts leading them to migrate. Example - increasing conflict between man and lions due to drought.

(vi) Practice of translocation

(vii) Adaptability - Many animals like leopards have started adapting to the human environment.

HWC leads to an anti conservation and antipathy towards animals. It should be averted by the following methods:-

(i) Following a landscape approach

Increase in the space for example of elephants by creating corridors

Increase the food by prolific breeding

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(ii) A united effort and community participation by creating awareness.

(iii) Use of technology – use of GPS tracking collars, SMS to community members when in threat, CCTV cameras, etc.

(iv) Biofencing of cactus to create boundaries rather than of electrocution.

(v) Immuno contraception methods

(vi) Collaboration with international agencies and inter agency coordination.

(vii) Culling and mass sterilisation programmes as last resort and only when needed.

Hence, in order to curb HWC, it is essential that a holistic and multi-stakeholder approach is followed as the way we treat animals shows what type of nation we are. A landscape approach is the need of the hour.

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17. Provide arguments both in favour of and against adoption of Genetically Modified (GM) crops on a large scale in India.

GM crops are which have been altered for durability or nutritional purpose. The gene is altered to provide various benefits.

Arguments in favour :

(i) Crop insurance: It provides crop protection and insurance to farmers and provides increasing tolerance of crops to various risks like hail, extreme heat, pests, disease, etc.

(ii) Economic benefits - The farmer earns better and is secured. It also provides better yield.

(iii) Global Acceptance - Many countries like US and Canada are producing GM crops on a large scale.

(iv) GM oil - Already, India imports a huge amount of oil which is genetically altered.

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(v) The Bt-cotton resistance to Pink Ballworm has led India to become the largest producer of cotton in the world.

(vi) Solve food security problem by increase in productio

Arguments against GM crops:

(i) Health -

- GMO and liver - Various rats examined have shown harmful effects on liver.
- Reproductivity issue and infant mortality
- Insufficient knowledge about the effect as clinical trials on humans are not done.

(ii) Environmental effect -

- Soil and water contamination
- May lead to cross pollination and creation of superweeds.
- Development of new virus strains and the pest developing resistance.

(iii) Patenting of GM crops and monopolising it by large farmers may lead to neglect to small farmers and creating misery for them.

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(iv) Pesticide poisoning - Recently, in Maharashtra 60 farmers died due to glyphosphate poisoning.

(v) Inadequate safety mechanisms and lack of transparency.

(vi) Lack of adequate data for testing before introducing it on a large scale.

Therefore, GM crops though is a stormbreaking technology may have various adverse impacts. A National Policy is required with involvement of various stakeholders, academicians, civil society groups for better discussion.

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18. Delineate the regions vulnerable to landslides in India. Also highlighting the reasons behind occurrence of landslides, suggest some mitigation measures.

More than 12% region of India is vulnerable to landslides.

Vulnerability -

(i) Very high vulnerable zone - Himalayas, Western Ghats, whole of North East India.

(ii) High vulnerable zone - Includes areas of eastern Ghats

Occurence of landslides Reasons -

(i) Himalaya region prone to landslides due to the seismicity induced by the plate convergence movement.

(ii) Hydraulic seismicity induces landslides i.e. through dam water and the tension.

(iii) Earthquake and other stress movements raise landslides vulnerability.

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(iv) Developmental activities in the mountainous regions loosens the soil and makes them vulnerable to landslides

Mitigation measures

(i) Landslide zonation and mapping for identification of the prone districts and areas.

(ii) Regulation of the construction activities by enforcing the laws.

(iii) Capacity building measures by providing training to people

(iv) Creation of disaster resilient infrastructure.

(v) Involvement of various stakeholders like academicians, geologists, ~~etc~~ etc.

~~(vi) Creation of~~

(vi) Early warning systems like the one recently installed in Sikkim.

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Therefore, various holistic and pro active measures are need of the hour.

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19. Bring out the importance of sustainable sand mining in India. Mention the steps taken by the government in this regard.

Sand mining involves removal of sand from riverbanks, shores, coasts for construction activities, earthenpots, building material, etc.

Illegal sand mining has led to certain issues and hence it is important for sustainable sand mining as-

(i) Helps in preventing the river to change its course - sand provides buffer to rivers.

(ii) It recharges aquifers and helps to regulate the groundwater level.

(iii) It sustains the environment of ghariyals and other wildlife who nest and bask in sand.

(iv) Helps the microorganisms to retain its environment.

(v) Provides sustainable livelihoods

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to the farmers. For example - illegal mining in the river Bharatapuzha of Kerala, a region which had plenty of nutrients for rice production is scarce.

(vi) It helps in nutrient recycling and regulating waterflow.

(vii) Helps in conservation of biodiversity.

(viii) There is no revenue foregone by ~~Various~~ the exchequer.

Various measures have been taken to promote sustainable sand mining like -

(i) State Governments have put in place various laws in order to determine and demarcate areas where and the potential of sand mining.

(ii) Sand Mining Rules & Regulations by the Centre which provides for scientific data collection, where to mine and also provides certain exemptions.

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The measures should be further strengthened by strict compliance of rules in order to save from the illegal mining.

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20. The Paris Agreement addresses crucial areas necessary to combat climate change. In this context, identify some of the key aspects of the Agreement.

Paris Agreement is a successor to the Kyoto Protocol of UNFCCC. It is an agreement laying down targets for reducing the impact of climate change.

Key Aspects of the Agreement:

(i) The countries have set a target to keep the global temperature rise well below 2°C of pre-industrial levels.

(ii) To pursue efforts to reduce by 1.5°C ~~only~~ further

(iii) Nationally determined contributions by developed and developing countries in order to reduce the greenhouse gases emission.
Example - India has contributed to reduce 33-35% of 2005 level by 2030.

(iv) Developed countries have promised

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to provide the developing countries finance. They are to mobilise $100 billion for mitigation and adaptation measures for developing countries.

(iv) Technology framework, Capacity building framework have been put in place.

(v) Earlier, only developed countries had binding contributions in Kyoto Protocol, now developing countries are also bound.

(vi) The agreement aims to place an inclusive agreement post the retirement of second commitment to Kyoto protocol.

The Paris Agreements tends to place a rule book in order to combat climate change issue for countries to adapt for sustainable development.

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