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GENERAL STUDIES (TEST CODE : 2346)

Name of Candidate	SAYALI BHIKA PAGAR		
Medium Eng./Hindi	ENGLISH	Registration Number	00934203
Center		Date	17/08/24

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 **HINDI & ENGLISH.**
   इसमें **बीस** प्रश्न हैं **हिन्दी** और **अंग्रेजी** 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।

Is student recommended for One-to-One mentoring?

Recommended	Strongly Recommended

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

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

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

प्रत्येक प्रश्न का उत्तर 200 से अधिक शब्दों में न दें। उत्तर का कंटेंट उसकी लंबाई से अधिक महत्वपूर्ण है। सभी प्रश्नों के समान अंक हैं। 12.5X20=250

1. मैंग्रोव तटीय समुदायों के कुशल-क्षेम और जैव विविधता में महत्वपूर्ण भूमिका निभाते हैं। विस्तारपूर्वक वर्णन कीजिए। साथ ही, इस संदर्भ में, हाल ही में शुरू की गई मिष्टी (MISHTI) योजना की विवेचना कीजिए।

   Mangroves play a critical role in the well-being of coastal communities and biodiversity. Elaborate. Also, discuss the recently launched MISHTI scheme in this context.

• Mangroves are characteristic littoral plants formations of tropical & subtropical sheltered coastlines. (30° North to 30° South)
• India has a mangroove cover of 5000 sq km. (approx).
• As rightly mentioned above mangroves play a critical role in the well being of coastal communities & biodiversity:-

1] Carbon sinks: Mangroves are 3-5 times more efficient than Rainforest covering area for carbon sequestration. Thus, they help in battling climate change
• They have rich peat soil & high level of carbon.

2] Reducing the impact of Cyclones & Tsunamis:
mangroves near shoreline reduce the impact of cyclones & tsunamis.
• Reduces wave height up to 66% → reduces erosion & flood risk.
• Protects agricultural land from saline water.
• A 100 m deep forest can reduce the destructive storm by 90%.

3) Caters to huge biodiversity:
- Mangroves have huge Biodiversity & protects many threatened & endangered animals/species ex: sea turtles, Royal Bengal tiger, crocodiles, fishing cats.

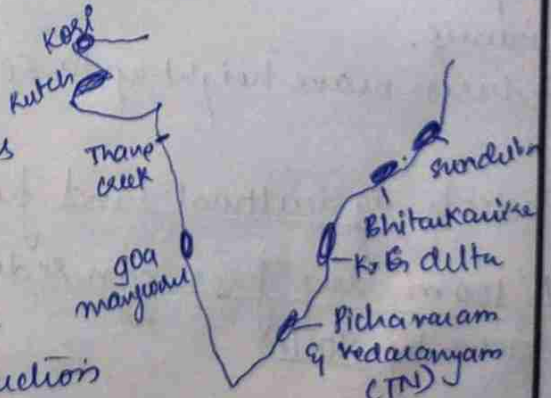
4) Maintain Ocean water clean:
- Acts as a filter & reduces excess nutrients flowing into the ocean.
- Helps in nutrient recycle

5) Important fisheries:
Local communities depend on many fishes available in mangroves.

6) Eco tourism:
Has great potential & can help keep mangroves intact.

7) Home to many tribal communities for survival through forest produce.

- Some prominent mangroves in India are:
  Sundarbans - largest
  Bhitarkanika - 2nd largest



- Some threats to mangroves are natural - cyclone, tsunamis, crabs eating young seedlings of mangrove
  Coastal development & destruction of mangroves for fisheries & aquaculture.

• Recently the government of India has launched MISHTI (Mangroove Initiative for Shoreline habitat & Tangible Incomes) scheme for better regeneration & utilisation of the mangroove system.

Key features:

1) Expansion of mangroves area: It aims at improving the area of mangroove cover (i.e increase by 550km sq) in 13 coastal states & UTs. - Eastern & western coasts

2) Green push: Part of a larger scheme to ensure India's commitment towards paris agreement.

3) Integration c various other schemes: to make local community more inclusive + integrated c MGNREGA, funds from compensatory Afforestation fund.

4) Collaboration c private entities to inculcate plantation techniques, conservation measures & management practices, public private partnership

* Mangroves are very important for both terrestrial & marine ecosystem, thus protecting them is very crucial to ensure well being of both ecosystem.

→ This step by government of India is introduced at the right time to ensure the well being of mangroves with timely interventions & involving local communities.

2. हाल ही के एक वैज्ञानिक आकलन के अनुसार, कभी पृथ्वी पर जीवन के लिए सबसे बड़ा खतरा माने जाने वाले ओजोन छिद्र के 2066 तक भरने की उम्मीद है। इस संदर्भ में, ओजोन छिद्र को भरने के लिए किए गए विभिन्न उपायों की विवेचना कीजिए।

According to a recent scientific assessment, the ozone hole, once considered to be the gravest danger to planetary life, is now expected to be repaired by 2066. In this context, discuss the various measures taken for ozone hole recovery.

• Ozone hole in the upper atmospheric layer is formed due to thining in the ozone layer present about 15-30km above the earth surface in Stratosphere. It was first noticed in 1980s over the antartic region.

⇒ As rightly pointed in the above statement, scientists have predicted that Antartic ozone hole by 2066, Artic hole by 2045 & rest of the world by 2040, the hole will be repaired.

⇒ The main reason for formation of Ozone hole was extensive release of Ozone depleting substances due to anthropogenetic activities - There are over 100 such man-made Chemicals responsible for ozone-layer depletion.

⇒ eg: Chlorofluoro carbons (CFCs), hydro-fluoro chlorocarbon (HCFC), HBFCs, halons, Methyl bromide, carbon tetrachloride, Methyl chloroform.

⇒ Major consequence of this was:- heating up of earth surface, more UV rays reaching earth as ozone is a protective layer preventing UV rays from reaching the earth surface.

⇒ People ~~more~~ are more prone for skin burns, skin cancer, gene mutation, cataract. It hampers other organisms as well.

⇒ Various initiatives were taken to tackle the issue:-

I] Vienna Convention 1985:
This was for protection of Ozone layer, by promoting internat cooperation & research on ozone depletion. It was to study the causes of ozone depletion, share information & develop a strategy to reduce the depletion.

II] The Montreal Protocol on substances that Deplete Ozone Layer, 1987:
Legally binding treaty that aimed to phase out the production & consumption of nearly 100 man-made chemicals referred to as ozone depleting substances (ODS)

→ Ozone Fund was set up in 1990 to support developing countries in their efforts to phase out the use of ODS.

III] Kigali Amendment to the Montreal Protocol, 2016:
It aims at phase down of Hydrofluoro Carbon (HFC) by cutting their production & consumption.

• They have zero impact on ozone layer but are 100 times more potent than Carbondioxide as a green house gas.
• HFCs are currently used as Replacement to CFCs, HCFCs.
• With Kigali Amendment to Montreal Protocal, global warming also will be targetted.
• The targets are different for different countries based on their status as developed, developing & 3rd world country.

⇒ India falls under 3rd world country, we are supposed to start HFC Roll out from 2028 & achieve 15% of ~~2019 level~~ 2024-25 by 2047.

⇒ Arresting ozone depletion is crucial not only to protect the earth's environment but also to protect ~~the~~ its biodiversity.

3. हाल ही में, भारत में हीटवेव (लू) की घटनाओं में वृद्धि हुई है। इसके पीछे निहित कारणों की विवेचना कीजिए और इस संबंध में विभिन्न शमन संबंधी उपायों का उल्लेख कीजिए।

Recently, there has been a surge in the incidence of heatwaves in India. Discuss the reasons behind this and state the various mitigation measures in this regard.

- According to IMD, a heat wave is considered when temperature of a station reaches at least 40°C or more for plains & at least 30° or more for hilly regions.
- In the past few years, India has recorded some of the most hottest summers on record.

Temperature rises due to various natural & man-made factors. The following are the reasons for the increased incidences of heatwaves in the country:

1) Climate change:

→ It is the major contributor to rising heatwaves all over the globe.

→ As the planet heats up, more & more heatwaves will become common. eg: Delhi, 2024

2) Urbanization:

→ "Urban heat island effect" - here a localized area can be several degree higher than the neighbouring areas.

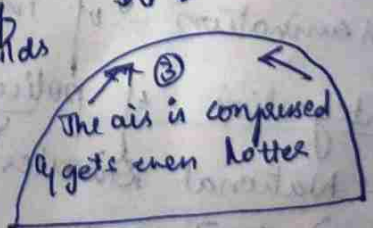
- heat dome

due to asphalt & concrete surfaces

Eg: Delhi, bangalore 2024

① A mass of warm air builds up in still & dry summer condition

② High pressure in the atmosphere pushes the warm air down



3) Reduced Natural Vegetation:
→ Vegetation acts as natural cooling system by absorbing & releasing water vapour through transpiration.
→ They take up Carbon dioxide & help in reducing the over Green House gas effect of the gas.

4) Scarcity of water:
→ India has a huge population staying in water stressed areas.
→ Encroachment into surface water resources can also increase Temperature by reducing the amount of moisture in the air.

5) Poverty:
It is the poor people who are more vulnerable to the damaging effects of heat wave.

Various measures to mitigate the impact of heatwaves include:

1) Public awareness:
→ Proper awareness & education should be given about the rising temperature on health, environment & economy.
→ This can be done by imparting education at school level, conducting awareness campaign, dissemination of information by media.

2) Integration of policy initiatives:
→ The National Disaster Management Authority (NDMA) & IMD are working with 23 states prone to high temperature towards heat action plans.

→ Heat Action Plans - work by participation of local bodies, civic groups & communities, promoting behavioural change, & adaptation by urban planning.

i) improve temperature monitoring across the cities by towns — weather stations.
granular data - microclimates.
identifying → high risk areas

ii) Regulating working hours of schools & various work places, ensuring public drinking water facilities

iii) improving & restoring water bodies, increasing vegetation by promoting cool roofs

3) Greening cities: Development plan of Tier 2 & Tier 3 cities → increase in the density & area of urban forest. eg: Naga Van, Niyavraki forest Plans under the help of NGOs.

4) Promoting Green infrastructure:

→ Use of permeable materials in civic infrastructure & residential construction - promoted.
• Building standard to be upgraded to avoid usage of heat-absorbent galvanised iron & metal roof sheets.
• Use of mud, insulated prefab walls.

⇒ Rising incidences of heatwaves in India is a serious concern & need to be addressed urgently.

4. प्रकृति-आधारित समाधान (NBS) से आप क्या समझते हैं? स्पष्ट कीजिए कि NBS विभिन्न खतरों के प्रति अनुकूलन में कैसे मदद कर सकता है।

What do you understand by Nature-based Solutions (NBS)? Explain how NBS can help in adaptation with regard to various hazards.

⇒ Nature-based solutions (NBS) is an umbrella term that aims to protect, sustainably manage & restore natural or modified ecosystems to meet crucial societal needs while building long-term environmental & economic resilience.

Eg: green roofs, rain gardens, etc.

⇒ NBS use & work nature as follows:

- Conservation → protection
- Restoration → management
- Sustainable use

⇒ Solution-oriented approach → to address social, economic & environmental challenges.

⇒ protects biodiversity, helps in disaster risk reduction, aids in improving our health & is vital for the climate.

NBS can help in adapting in the following hazards

1) Drought:

→ Building infrastructure which helps in retaining rain water, storage & utilisation can help us tackle drought like conditions.

→ This can help us tackle the water stress issues faced in all metropolitan cities

2) Urban floods:
Building green infrastructure & proper drainage & channels. using water permeable asphalt & designing according to the need of the area will help prevent the prevalent issue of urban floods faced due to a more a little above the normal rainfall. Eg: Bhopal has adopted

3) Mangroves Restoration
→ They play an important role in protecting the coastlines from cyclones & other hydrological hazards. Thus, investing in restoration of mangroove can benefit the community in innumerous ways.

3) Wetland Restoration
Urban wetland as water aquifiers, help restore the ground water level, act as carbon sink, desilt the river.
Thus their Restoration is of crucial importance
Eg: Bellandur, Ulsoor lake in Bangalore.
Thane creek.

4) Agroforestry: will make better use of moisture in soil & other resources & thus compensate for crop failures & livestocks lost due to drought.
Eg: Mixed farming.

5) Planting cover crop: To protect soil during raining season, reduce soil erosion & enhance nutrient cycling.

6) Implementing controlled burns & other forest management techniques to reduce the risk of catastrophic wildfires.

7) Maintaining natural floodplains to absorb & slow floodwaters, reduce the impact of flooding events

8) Living shorelines:

→ Using natural materials like plants & oyster reefs to stabilize shorelines & prevent erosion

⇒ Given the importance of ~~robots~~ nature based solution in various aspects such as disaster Risk Mitigation, Restoration of ecosystem. Government of India has taken certain steps in this direction:

Eg: • MISHTI programme
• Ramsar convention ratification.
↳ Amrit Dharohar
• Cities & Forests.
• AMRUT cities.

5. पर्यावरणीय प्रभाव आकलन (EIA) बुनियादी ढांचे के विकास से होने वाले पारिस्थितिक नुकसान को न्यूनतम बनाए रखने वाले आधारभूत उपायों में से एक है। इस संदर्भ में, EIA में शुरू की गई स्टार रेटिंग प्रणाली से जुड़ी चिंताओं पर चर्चा कीजिए।

The Environmental Impact Assessment (EIA) is one of the cornerstones in ensuring that the ecological costs of infrastructure development are minimal. In this context, discuss the concerns associated with the star rating system introduced in the EIA.

• Environment Impact Assessment (EIA) is a tool used to assess the significant effects of a project or development proposal on environment.

• It is of immense importance in protecting environment & ecology from unplanned infrastructure development.

Its significance:

1) Ensure sustainable Development:
→ Helps ensure development does not harm environment. Thus helps them go hand in hand.

2) Access the impact of development project:
→ access the environmental, economic & social impact of any project

3) Enhances peoples participate:
→ Ensures a public hearing for all the people who will be affected if the project becomes a reality.

4) Explores alternatives:
→ provides the most efficient method to reduce the impacts of the project on the environment, which balances both the environment & available resources

5) Fair & equitable decision-making:

5. पर्यावरणीय प्रभाव आकलन (EIA) बुनियादी ढांचे के विकास से होने वाले पारिस्थितिक नुकसान को न्यूनतम बनाए रखने वाले आधारभूत उपायों में से एक है। इस संदर्भ में, EIA में शुरू की गई स्टार रेटिंग प्रणाली से जुड़ी चिंताओं पर चर्चा कीजिए।

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→ provides the most efficient method to reduce the impacts of the project on the environment, which balances both the environment & available resources

5) Fair & equitable decision-making:

→ helps in decision-making, as the approval of the projects are based on the findings of assessment.

⇒ Recently the government rolled out star rating system for State Environment Impact assessment Authorities (SEIAA) – to make them more efficient, transparent & accountable.
- It "ranks" & "incentivizes" states based on how quickly & efficiently they give clearance for development projects.

Concerns associated with ~~state~~ SEIAA:-

1) Improper scrutiny:
→ State agencies under pressure might take shortcuts & avoid giving a detailed report to give clearance faster.

2) Lack of informed decision-making:
→ SEIAA needs to gather proper data to give detailed report, on asking the project proponents, less data is giving → thus hampering informed decision making.

3) Generates unhealthy competition:
→ As the states are competing for star rating, it will lead to hurried decision-making thus comprising the purpose of whole process.

4) Lack of trained personnel:
→ State committees are currently hampered, as they have few experts (environmental)

& decision-making is being left with bureaucrats who may prioritize the economic benefit of project over the environmental concerns

3) Hampers environmental governance:

→ Environmental clearances are viewed as bottlenecks by governments & project proponents, thus having speedy process will favour the process to be on the side of government.

⇒ Rather than rating based on speed of clearance, it should prioritize ~~on~~ recruiting more environmental experts, & having detailed environmental reports, so as to have more resilient infrastructure.

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6. समुदाय आधारित आपदा तैयारी से आप क्या समझते हैं? प्रत्यास्थता के लिए समुदाय आधारित आपदा प्रबंधन योजनाओं की प्रक्रिया और तैयारी की रणनीति की व्याख्या कीजिए।

What do you understand by community-based disaster preparedness? Explain the process and preparation strategy of community-based disaster management plans for resilience.

Community based disaster preparedness (CBDP) is an approach to build the capacity of communities to assess their vulnerabilities to both human-induced & natural-hazards & develop strategies & procure resources necessary to prevent &/or mitigate the impact of identified threats as well as respond, rehabilitate & reconstruct following their onset.

Eg: Apada Mitra in Puducherry, Odisha; community outreach programme.

The process & preparation strategy of community-based disaster management plans for resilience are given below:

I] Pre-disaster phase:

1) Community orientation: vulnerabilities that they are exposed to, identified vulnerable groups

2) Stock-taking of resources:
ensuring shelters for disaster, stocks for emergency supplies- food, water, medicines.

3) Risk & vulnerability assessment:

Identifying the Risk = $\frac{\text{Hazard} \times \text{Vulnerability}}{\text{Capacity of population}}$

→ assessment of vulnerable areas, resilient infrastructure
→ vulnerable population - children, pregnant women, elderly.

4) Formulation of preparedness plan:
→ should take cognizance of needs of community, clarify measures to be taken by the community before, during & after the disaster.
→ specify roles & responsibilities to various officials departments, NGOs, Panchayats, etc.

II] During the occurence of Disaster:
1) Organizing search rescue & evacuation activities: identifying victims, bringing them to safer places, first aid & shelter
2) Providing shelter to people & livestock: to be given in preplanned locations, ensure sanitation, food supply, clean water
3) Debris clearance & dead body identification
→ disposing dead bodies & livestock is a major concern in this phase & should be planned accordingly
→ clearance of debris due to collapsing infrastructure

III] Post-disaster phase:
• Detailed damage assessment:
to understand the magnitude of loss both in terms of lives & damage to infrastructure, damage to crops, etc

2) ~~Preparedness~~ Rehabilitation plan: comprehensive economic rehabilitation plan, Restoration of livelihood

3) Social rehabilitation:
→ this includes strengthening health sector, anganwadis, schools, community centres, etc

4) Monitoring of community-based disaster management
→ building of appropriate monitoring & evaluation mechanisms to facilitate proper utilization & implementation of resources

⇒ Communities have good social capital of trust & work good in coordination, but they alone cannot tackle issue with disasters, so goverment should work with them & build their capacity, thus reducing the burden central disaster relief machinery as they will be helped by ~~some~~ local capable communities.

7. भारत में भारी मात्रा में उत्पन्न होने वाले ई-अपशिष्ट के निपटान के समक्ष कौन-सी बाधाएं विद्यमान हैं? ई-अपशिष्ट का समय पर और सुरक्षित पुनर्चक्रण सुनिश्चित करने हेतु उपाय सुझाइए।

What are the impediments in disposing the huge quantity of e-waste being generated in India? Bring out ways to ensure timely and safe recycling of e-waste.

• India is 3rd largest e-waste generator after China & USA according to global E-Waste Monitor 2020.
• Only about 20% is recycled in India.

⇒ The major impediments in disposing the huge quantity of e-waste generated in India:

1) Lack of dedicated & Robust e-collection chain:
→ only 15% ewaste is collect along c rest of the waste, rest all is collected by informal sector workers, using hazardous metabd such as open-air incineration & acid leaching.

2) Lack of infrastructure: At present 567 authorised CPCB recyclers in 22 states c total recycling capacity of 1.7 mn tonnes, which is insufficient for the amount of waste generated in our countries.

3) Limited coverage: E-Waste (Management) Rules, 2016 covered only 21 types of electrical & electronic equipment more than 100 types are included in the amendment of 2022.

4) Limited involvement of Urban Local Bodies:
E-waste does not fall in the list of garbage to be collected by municipalities thus there is no mandate for municipalities to collect it.
→ ULBs are responsible for only collection & channelising "orphan products" to authorised recycler.

5) Lack of Awareness & Financial Incentives:
Most consumers have no awareness about reckless disposal of e-waste generated.
- lack of market information about prices for various e-waste components, → few financial incentives for responsibly disposing off their e-waste.

Various measures can be adopted for timely & safe recycling of e-wastes, such as:

1) Separate department in urban local bodies:
ewaste generated in urban areas thus ULBs should be made enabling for this.

2) Market Information about E-waste Prices:
→ The prices should be widely publicized among urban ~~consumers~~ customers to create a powerful market signal for customers to sell it to recyclers.

3) Strengthen unorganised sectors
→ Grant schemes for incentivizing small-scale informal e-waste recycling centres to upgrade the facilities so that they comply ~~c~~ environmental & safety regulations

4) Lessons from developed Countries:
In EUs rules were set up in 1990s; yet only 48% of e-waste is recycled. Thus India should prioritize on incentivizing the customers to recycle their e-waste

5) Setting up of Repair & Reuse Cafe:
Repair centres to be set up to extend the life of electronic appliances.

6) Instructing producers to design while keeping recycling in mind: Thus making the consumer recycle easily, adds brand value

7) Learning from Egypt - E-waste app:
→ App to ensure recycling & incentivizing by offering coupons for new device.

⇒ Given India's growing economy, it is quite obvious that the e-waste generate in future will go up many folds up - thus we should step up our recycling plans to ensure effective e-waste recycling happens.

8. अपनी अनूठी भू-जलवायु परिस्थितियों के कारण, भारत के समक्ष बड़ी संख्या में प्राकृतिक आपदाओं का जोखिम मौजूद है। उदाहरणों सहित विस्तारपूर्वक वर्णन कीजिए।

India is vulnerable to a large number of natural disasters on account of its unique geo-climatic conditions. Elaborate with examples.

⇒ Indian geography is blessed with all kinds of geographical feature like mountains, plateaus, coastal region, semi-arid region. But with this it is also exposed to a long range of vulnerabilities to various natural hazards / disasters.

⇒ Out of 36 Indian States & UTs, 27 are at risk of major natural disaster.

- 58.6% of land prone to earthquakes
- 8000 km sq. area - coastal region for hydrological disaster - cyclones, tsunamis.
- Ecological sensitive zones such as Himalayas, western ghats, eastern India is prone to landslides,
- The great northern plain & numerous perennial rivers is prone to floods
- Semi arid & arid region in west are prone to drought like condition

⇒ India is among the top to most disaster prone countries in the world.

⇒ Due to its unique geographic, climatic & socio-economic condition - it is prone to various disasters as follows :-

1] Cyclones : Due to its location in between 30°N & equator it is prone to tempuate cyclones. Around 5-6 cyclones on an average hit the Indian peninsula every year, out of which 2-3 are very severe.

• India has a coast line of 7500 kms (approx). 13 states & UTs together form this boundary.
→ Cyclones are usually more severe over the eastern coast compared to western coast.

2) Earthquake: 58% of area of land in India is under earthquake prone zone.
• This is due to presence of fault lines, fold mountains i.e Himalayas - leading to formation thrust lines which are high in seismic activity. Thus, the northeastern states, Bihar, Uttarakhand are prone to earthquake.
• There is a fault line in gulf of Kutch leading to the earthquake in 2001 — very dwastating.

3) Floods:
• The northern plains of India are home to numerous perennial rivers such as Ganga, Yamuna, Kosi. These rivers along c Indian southwest monsoon - often lead to floods. Ecological sensitive area suffer due to these as was seen in Bihar all the time.
Kerala floods due to high annual rainfall.

4) Landslide:
The western ghats, Himalayan region, North-eastern states, Andaman & Nicobar are areas prone to large number of landslide due to cloudburst, surface water runoff, young topography.

Eg: As recently seen in Wayanad landslides due to unscientific development activities in the western ghats.

5) Droughts:
The western states of India which include Gujarat, Rajasthan, Maharashtra are arid & semi-arid in nature & receive less annual rainfall as compared to other parts of the country. Thus they are more prone to draught like Condition. 68% of country is prone to drought like Condition

6) Wildfires:
India's forested region suffers from wildfires from time to time in dry seasons.
Eg: Uttarakhand in 2016.

7) Heatwaves:
India experiences extreme heatwaves in the month of April to may. This is majorly seen in cities of northern states.

⇒ As explained above it is clear that India suffers from varied forms of disasters in different location. Thus NDMA, 2005 was enacted to tackle these disasters under a competent authority effectively.

9. राष्ट्रीय आपदा प्रतिक्रिया बल (NDRF) द्वारा अपने कार्यों के निष्पादन में सामना की जाने वाली प्रमुख चुनौतियों की विवेचना कीजिए और इसकी प्रभावशीलता को बढ़ाने हेतु उपाय सुझाइए।

Discuss the major challenges faced by the National Disaster Response Force (NDRF) in performing its functions and propose measures to enhance its effectiveness.

⇒ National Disaster Response force was established under National Disaster Management Act, 2005, it functions under ministry/department of Home Affairs.

⇒ It has been very effective & has proved its competence again & again various disaster rescues.

⇒ It played a major role in recent Wayanad Landslides domestically. & it also helped in Turkey & Syria during Earthquake Relief sent under Operation Dost

Major challenges faced by the NDRF in executing its role

1) Inadequate Capital Infrastructure: Over the years there is decline in funding ⇒ inadequate infrastructure for NDRF battalion.

2) Low budget for training: lack of modern training facilities for NDRF personnels, There is very little spend on training than what is actually allocated.

3) Increased Activities:

They help in individual level crisis to large scale disaster, such as a child falling in pit to cyclone.

4) Lack of continuity: NDRF is 100% deputational force, thus personnels from CRPF, & police organisation are posted for a duration of 7 years.

5) Insufficient equipments: huge shortage of essential equipments needed for various rescue operation - thus risking their lives & as well as others.

6) Dual Control:

→ There is great ambiguity in the control & command structure. Ministry of Home Affair is responsible for funds & execution, NDMA is responsible for administrative control. Thus there is between the two. Thus delaying various processes.

Measures to enhance its effectiveness

1) Along with deputational force inclusion of young & able bodied youth for training & providing service from various organisations such as National Cadet Corps, Nehru Yuva Kendra Sangathan,

2) Addressing financial constraints:

3) Cooperation with local bodies for effective disaster Risk mitigation

4) Budget allocation for establishing & upgrading appropriate training infrastructure, hiring well trained personnel & producing state of art technical equipment for training of the force as per international standard

5) Shortage of equipment – to replace all defective ones with latest equipment according to international standards

6) Capacity of state as well as community to be well build to tackle various disasters effectively.

7) Specialisation of NDRF for various different types of disasters.

8) Co training exercise with international forces for experience building.

⇒ NDRF has done excellent work till now & will keep performing to the best of its ability, but as it is the states responsibility to keep striving to do better, thus increasing expenditure on NDRF for capacity building the benefits will definitely outweigh the money spent.

10. भारत में आपदा जोखिम न्यूनीकरण में स्थानीय निकायों की भूमिका महत्वपूर्ण है। उदाहरणों सहित विवेचना कीजिए।

Local bodies are the key to disaster risk mitigation in India. Discuss with examples.

⇒ Local Bodies include the panchayat & municipalities whose inclusion in the disaster risk mitigation is crucial. This is because they are closest to the people & communities affected by disasters & best placed to coordinate & implement disaster risk reduction measures at the local level.

⇒ They have 1st-hand knowledge of their community's social, economic, infrastructure, & environmental needs, helping them to provide support in a disaster.

★ The Sendai Framework for Disaster Risk Reduction (2015-30) calls for empowering local authorities through appropriate regulatory & financial means to work & coordinate with civil society, community & indigenous peoples & migrants in disaster risk management at the local level.

Role of Local Bodies in Disaster Risk Mitigation

- **Pre-Disaster Phase**
  - **Resource Mapping:** Mapping of Resources & facilities in & around its functional area & special emphasis on their suitability for disaster management
    → For settlement of displaced people, storage of food, water, medical services
  - **Vulnerability mapping:**
    → Checking for vulnerable population, locations at regular intervals to ensure effective disaster risk mitigation

• Early Warning Systems:

Early Warning & Reporting systems : the list of nodal persons across the functional area.
Eg: flood sensor in mumbai to monitor water level to prevent urban floods

During Disaster:

• Disaster Response:

→ The local bodies play crucial role as they are the first responders.
Eg: Kerala floods 2018, local authorities were present in rescue activities.
→ They help in setting up of settlements, temporary shelters, arranging essential supplies.

Arranging Necessities:

Starting a community kitchen & ensuring clean water for drinking.
• Vaccination for measles, cholera.
• Looking out for vulnerable groups

Post Disaster:

• Medical Camps:

• Ensuring the well being of vulnerable group.
→ vaccination drive to prevent post disaster epidemics

Recovery:

→ coordinated activities : NGO, government organisation private members for early Rehabilitation of

displaced population.
→ They also help in building critical infrastructure for aid & faster connectivity.

Mitigation

→ Spreading Awareness among people.
→ Educating population
→ Mock drills
→ Youth training for Disaster Response

Considering this importance, Ministry of Panchayat Raj has launched Disaster Management Plan for Panchayati Raj institutes.

⇒ As India is prone to various kinds of Disasters due to its varied geography, inclusion of local bodies can help us mitigate our risk associated with disasters more effectively.

11. मानव स्वास्थ्य और पर्यावरण पर ध्वनि प्रदूषण के प्रभाव का उल्लेख कीजिए।

Bring out the impact of noise pollution on human health and the environment.

- Noise pollution is any unwanted or disturbing sound that affects the health & well being of humans & their environment.
- WHO defines sound above 60dB as noise pollution. harmful >70dB, painful >120dB.

Causes of noise pollution: Construction, traffic, fire-crackers, concert, loud music, Animals.

Effects of Noise pollution of human health

1) Physical: i) Respiratory agitation
   ii) High Blood Pressure due to adrenaline, cortisol
   iii) Headaches, racing pulse
   iv) Tinnitus
   v) Hearing loss due to continuous exposure
   vi) heart attack in patient c high risk
   vii) gastritis, colitis
2) Psychological:
   i) stress
   ii) fatigue – reduced productivity
   iii) depression
   iv) Anxiety
   v) hysteria
   vi) sleeping disorder
   vii) cognitive impairment in younger age group.

3) Sleep & Behavioural Disorder :
i) ↑ irritability due to disturbed sleep
ii) low productivity
iii) lack of attention
iv) Young Kids ~ ADHD

4) Memory & Concentration
i) lack of ability to focus
ii) low performance
5) Emotional Troubles.

Impact of Noise Pollution on the Environment

i) Impacts Communication of Animals:
Animals communicate ~ each other at frequency which are inaudible to humans. These get masked due to excessive noise leading to isolation in animals. Communication gets hampered., thus they get, they loose the ability to navigate properly.

ii) Impact on health of organisms:
• Loud noises → raise cortisol in many species such as dogs, cats.
associated ~ premature delivery, adverse Impact on pregnancy.
→ This stress hormone can affect their physiological functioning in body leading to various ill effects. → gene defects, raised heart rate, raised Blood pressure.

iii) Unusual Animal behaviour :-

- Aquatic animals use sound frequency to detect prey, predator & navigate.
- Noise pollution can hamper their ability to protect themselves from predators & also hamper their ability to navigate.
- Bats are also blind & depend on sound frequency to locate prey, predator & navigate
- Dolphin also use sound to navigate their way in ocean.

⇒ Thus it becomes important to understand the effect excess noise on humans & animals, & as noise pollution has adverse affect on both.

⇒ various steps are being taken by setting up of limits in residential, public areas for noise permit.

12. चक्रवातों के कारण होने वाली आपदाओं से निपटने में भारत की तैयारियों का मूल्यांकन करते हुए, भारत में चक्रवात आपदा प्रबंधन क्षमताओं में सुधार हेतु किए गए उपायों की विवेचना कीजिए।

Evaluating India's preparedness in handling disasters caused by cyclones, discuss the measures taken to improve cyclone disaster management capabilities in India.

- Cyclones ~~are~~ is a region of low pressure (atmospheric) surrounded by high atmospheric pressure resulting in swirling atmospheric disturbances accompanied by powerful winds.
- India has a coastline measuring around 7500Kms & is exposed to 4-5 cyclones on an average every year of which 2-3 could be very severe.
- Given the vulnerability of India's geographic location to cyclones, we have taken several steps to mitigate the cyclones.

Preparedness measures:

- National Disaster Management Authority has specific guidelines regarding Cyclone (nodal ministry - ministry of Earth Sciences)
- IMD - Early Warning systems, water buoys help in accessing the water temperature, wind speeds, pressure system over ocean & predict any formation of cyclones.
- National Disaster Response Force (NDRF) the nodal force under Union Home ministry is trained group of personnel in tackling diaster specific problems.

- Regional monitoring centres in coastal areas to have continuous surveillance.
- Aircraft probing of Cyclone (APC) facility: surveillance of upper air phenomenon, cloud aerosol interaction
- Colour Coding - green - safe, Yellow - "be aware", orange - "be prepared" & Red "take action".
- Saline embankment: to prevent ingress of saline water
- Coastal flood zoning: to plan rescue & restoration
- National Disaster Communication Infrastructure
  → to ensure effective communication between local & central agencies

Mitigation Measures

1) National Cyclone Risk Mitigation Programme (NCRMP)

→ Reduce vulnerability of coastal communities to cyclone & other hydrological hazards -
- early warning dissemination system
- Capacity building in local communities
- Emergency shelter after evacuation
- Supplies for emergency - food, water, medical
- Strengthening Disasters Risk Mitigation capacity at local, state & central level.

There are 13 states & UTs vulnerable to cyclones & hydrological hazards, thus focused mitigation strategy have been implemented

2) Awareness & Education of local communities — explaining their hazards associated w cyclones, various warning systems.
3) Building disaster Resistent infrastructure & zone mapping.

While these efforts have drastically reduced in disaster related loss of human life & property. Here are some suggestion:

1) The funds available for reconstruction are inadequate — more central assistance needed
2) Media attention on situation is limited
3) Little discussion on quality & quantity of relief given to people
4) Current strategy would prove to be inadequate if there were any major future tsunamis.
5) Effective co-operation between states & centre for better disaster management.
6) Use of technology to ensure preparedness for disaster management.

* Performing Social Disaster Risk Audit in risk prone areas, making Disaster management regime more inclusive, would go a long way in making cyclone Disaster management more effective.

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13. भारत में व्यापक स्तर पर होने वाले मृदा क्षरण के कारणों को रेखांकित करते हुए, मृदा प्रदूषण की समस्या को दूर करने के लिए उठाए गए विभिन्न कदमों की विवेचना कीजिए।

Highlighting the reasons behind widespread soil degradation in India, discuss the various steps undertaken to address the problem of soil pollution.

- Soil degradation is the physical, chemical, biological decline in soil quality due to its improper or poor management for agriculture, industrial or urban purposes.
- This issue is important as half of Indian population survives on agriculture & allied industries.
- United Nations convention to Combat Desertification has set various targets to tackle desertification as a result of soil degradation. Restoration of 1.5bn hectares of degraded land by 2030.

Reasons behind widespread soil degradation:

1) Excessive fertilizer use: Subsidies on fertilizers have led to ~~a~~ extensive use of fertilizers leading to soil degradation.
2) Heavy metal pollution: Due to fertilizer use, mining, manufacturing, mineral extraction, dumping industrial waste, chemical spills & e-waste
3) Excessive water - over irrigation:- alkanisation ~~lead~~ washes off nutrients
4) Mono cropping: nutrient depletion.
5) No gap between crops: no time given to soil to restore its nutrient capacity.
6) Use of pesticides.

7) Deforestation:
Forests help in preventing soil erosion, thus help maintain soil cover for agricultural activities.
- Increased deforestation due to rapid urbanisation, for timber, for increasing agricultural land.

8) Urbanisation:
Removing vegetation cover, compacting soil during construction & altering drainage patterns. Impermeable concrete covering increases surface runoff & topsoil erosion.

9) Improper disposal of waste:
Plastic, heavy metals, toxic chemicals cause soil degradation if garbage is not disposed properly.

Steps taken to address soil pollution:

1) Pradhan Mantri Krishi Sinchai Yojana:
"Per drop more crop" - promoting irrigation efficiency to prevent wastage of water & prevent soil degradation

2) Pradhan Mantri Paramparagat Krishi Vojana:
- Promoting natural farming practises - low-cost organic farming.
- Mission organic value chain Development for North-Eastern Region.

3) National Afforestation programme:
extensive Afforestation to control soil erosion

4) National Green Mission:

5) Rashtriya Krishi Vigyan Yojana: protects the loss of top soil, improving soil fertility, enhancing crop production, land & water productivity of soils & the ecosystem as a whole.

6) Soil Health Card: provides every farmer's soil nutrient status of his land & dosage of fertilizers to be maintained.

7) Mangroves initiative for shoreline habitat & Tangible Incomes - To restore mangrove which help in preventing saline water to enter agricultural land near coastal areas.

8) Education & Awareness Among Farmers regarding effective farming practices

9) Research & Development in ensuring cropping patterns, seeds which require lesser fertilizer usage, etc.

⇒ There is a need to strengthen communication channels between academia, policy makers & society for the identification, management & restoration of degraded soils, as well as in the adoption of participatory measures.

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14. भारत में शहरी बाढ़ की बढ़ती घटनाओं के कारणों का उल्लेख कीजिए। साथ ही, देश में शहरी बाढ़ के जोखिम को कम करने के लिए सरकार द्वारा उठाए गए कदमों पर भी चर्चा कीजिए।

State the reasons for the increasing instances of urban floods in India. Also, discuss the steps taken by the government to mitigate the urban flood risk in the country.

• Urban floods is flooding that happens in urban area usually caused by excessive runoff in urban area due to overburdened drainage system & unregulated construction.

• Recent instances of urban flooding seen in Delhi, Mumbai, & Bangalore 2023 has shown the lacking infrastructure capability of our cities.

Reasons for Urban flooding are as follows:

I) ~~Unregulated~~ Meteorological Factors:

1) Southwest monsoon: localised & concentrated rainfall. Eg: Mumbai 2005
2) Northeast monsoon: frequent cyclones in middle of October. eg: Chennai 2015
3) Depressions & Cyclones: heavy rainfalls & storms Eg: Hyderabad 2020.
4) Western disturbances: extra-tropical weather system. Eg: North Indian cities
5) Thunderstorms & Cloudbursts: hilly areas

II) Anthropological Factors:

1) Climate change. extreme weather conditions.
2) Improper drainage system: Lack of proper drainage system, silting in the drainages
3) Land use pattern: urbanisation - cemented pavement no place for rainwater percolation.

4) Occupation of flood plains: low lying areas are prone for more flooding
5) Urban Heat Island effect: localised rainfall
6) Improper disposal of garbage - leading to clogging of drains.

III] Hydrological Factors
1) Surface Run off
2) Groundwater level prior to storm
3) Natural surface infiltration rate
4) Synchronization of various runoffs from various parts of watershed.

STEPS Taken By Govt to Mitigate urban Floods.

1) NDMA guidelines for Urban floods: to Released 2005 to tackle the issue of urban flooding
2) Sponge Cities Mission: Nature-based solution to distribute water better & improve drainage & storage. Using permeable asphalt, new canals, restoration of wetlands to ease waterlogging issues
3) AMRUT Mission: Atal Mission for Rejuvenation & Urban Transformation: city planning: green infrastructure - green roofs, rain gardens, rainwater harvesting systems.
4) Rejuvenation & Restoration of lakes, wetlands → help in preventing waterlogging

Eg: In cities like Bangalore - Bellandur, Ulsoor lakes.
Thane creek in Mumbai.

5) Nature Based Solution:
Blue-green infrastructure to tackle drainage issues.
Eg: Bhopal green blue master plan, Delhi's Master Plan 2041, Pune urban Agriculture plan.

6) Education & Awareness to general public to tackle such situation

7) Early Warning Systems - to understand & plan preparedness for any untoward event.

* Indian history of Indus Valley Civilisation has given history of well planned cities & proper drainage system → thus acting as a role model for our cities about importance of proper drainage.

⇒ working on these lines will help ensure the issues & rapid urbanisation, water logging, prevent loss of life.

15. भारत में बढ़ते मानव-वन्यजीव संघर्ष के कारणों की पहचान कीजिए। इस संघर्ष को कम करने के लिए सरकार द्वारा कौन-से कदम उठाए गए हैं?

Identify the reasons for increasing human-wildlife conflict in India. What are the major steps taken by the government to mitigate this conflict?

- According World wide fund for Nature (WWF) Human-wildlife conflict is defined as any interaction between humans & wildlifes that results in negative impacts of human social, economic or cultural life, on the conservation of wildlife populations or on the environment.
- This problem is common in India given the huge population of humans as well as elephants, lions tigers & various other species.

⇒ Around 500 elephants & 1300 humans have lost their life in human-wildlife conflict.

Reasons for increasing Human-wildlife conflict in India are as follows:

1) Habitat destruction & fragmentation:
Growing human population → increased clearance of forests/habitats of animals → creation of human settlement.
- Forcing animals to search for food & water in human settlements.
- Reduced prey base in habitat.

2) Movement of livestock & human into protected areas: for resources leads to conflict b animals.

3) Invasive Alien species: leads to competition for

resources & thus pushes wildlife in human settlement for food.

4) Climatic factors: forest fires, floods, altered vegetation drought – pushes them out of their natural habitat.

5) Increase in wildlife population due to conservation effort: led to increase in population without proper prey base.

6) Due to trade of animals – exposed to threats like illicit trade for various products.

7) Agricultural expansion → destruction of habitat.

8) Lack of Protected Areas: Wildlife are prone to poaching

9) Transport Network: Railways & Roads passing through protected areas – have killed various animals.

10) Poaching

Steps Taken by Government of India to mitigate Human-wildlife conflict:

1) Wildlife Protection Act, 1972: Setting up of National Parks, protected areas to ensure safety to wildlife.

2) Setting up of Human-Wildlife Conflict Mitigation Strategy & Action Plan: to address underlying causes & factors contributing to conflict, focusing on the "Drivers - Pressures - State - Impact - Response" framework.

3) Creation wildlife corridors:
Kerala, Madhya Pradesh & Karnataka have established specific corridors for movement of wildlife

4) Legal framework: Environment Protection Act 1972, National Biodiversity Act 2002. protection of wildlife their habitat.

5) Funding to state: to invest in wildlife protection & setting up of protected areas.

6) International cooperation: Indo-German, Human-wildlife conflict mitigation plan.

7) Setting up National Green Tribunal: To check the functioning of various agencies related to wildlife conservation.

⇒ The above steps taken show Indian dedication towards protection of wildlife from various threat. & Also prevent Human-wildlife conflict.

16. भारत में कृषि सब्सिडी के पर्यावरणीय प्रभाव का आकलन कीजिए। साथ ही, इस प्रभाव को कम करने हेतु आवश्यक उपाय सुझाइए।

Assess the environmental impact of agricultural subsidies in India. Additionally, suggest measures to reduce this impact.

- Agricultural subsidies have been an integral part of Indian Agricultural system over many years.
- Various types of subsidies provided under these are:
  - i) Input subsidies (electricity, fertilizer, power, irrigation, seed, etc).
  - ii) Output guarantee - Minimum Support Price, export subsidies, etc.
- However, these lucrative subsidies have major environmental impact:

1] Minimum Support Price ⇒ Incentivizes farmer to mono-crop rather than crop rotation → over exploitation of soil → soil degradation → extensive use of fertilizers (subsidized)

↓

over use - surface runoff

↓

river/water bodies pollution

↓

eutrophication

↓

3] Water pollution

↓

Biodiversity damage

2] Water stress: Without understanding the soil profile farmers plant crops for the sake of MSP leading to injudicious of water

↓

groundwater drinkable level depletion

↓

water stress

* This is can be again attributed to virtual water export - export subsidies on water intensive crop

4] Air pollution: Subsidies on Animal Husbandry, fertilizers → led to extensive use of fertilizers (labelled as "red category ↓ CPCB)
↓
Release of Nitrites, Nitrates, Methane, SO_2, fluoride
• Animal · poultry, cattle are major producers of methane.
• Certain crops (Rice) are known emitters of methane.

5] Forest clearance: To increase the total cultivable land. → to raise productivity & profit.

Measures to Reduce this impact:

1] Promotion of Crop Rotation: Bringing various crops under the ambit of minimum Support Price & altogether scrapping MSP by promoting open market economy.

2] Support efficient use of fertilizers: promotion of organic methods, reducing dependence on fertilizers & efficient use by ensuring zero wastage.
eg: 100% Neem coated subsidized urea.

3] Promotion of drip irrigation system: efficient use of water in water stressed areas & reduce ~~the~~ depending on ground water.
Prevent water wastage.

4) Funding for nature-based organic methods of farming:

Eg: Paramparagat Krishi Vikas Yojana - promotes cluster organic farming.

5] Building critical infrastructure: Roads, storage house - will help farmers get better prices for their crops & reduce their exploitation & reduce their dependence on subsidies.

6] Education & Awareness:
Educating them about organic farming, mixed cropping, efficient use of fertilizer & water, soil profiling to make them more efficient farmers.

7] Incentivize sustainable agriculture.

8] Zero tillage & extended crop rotation

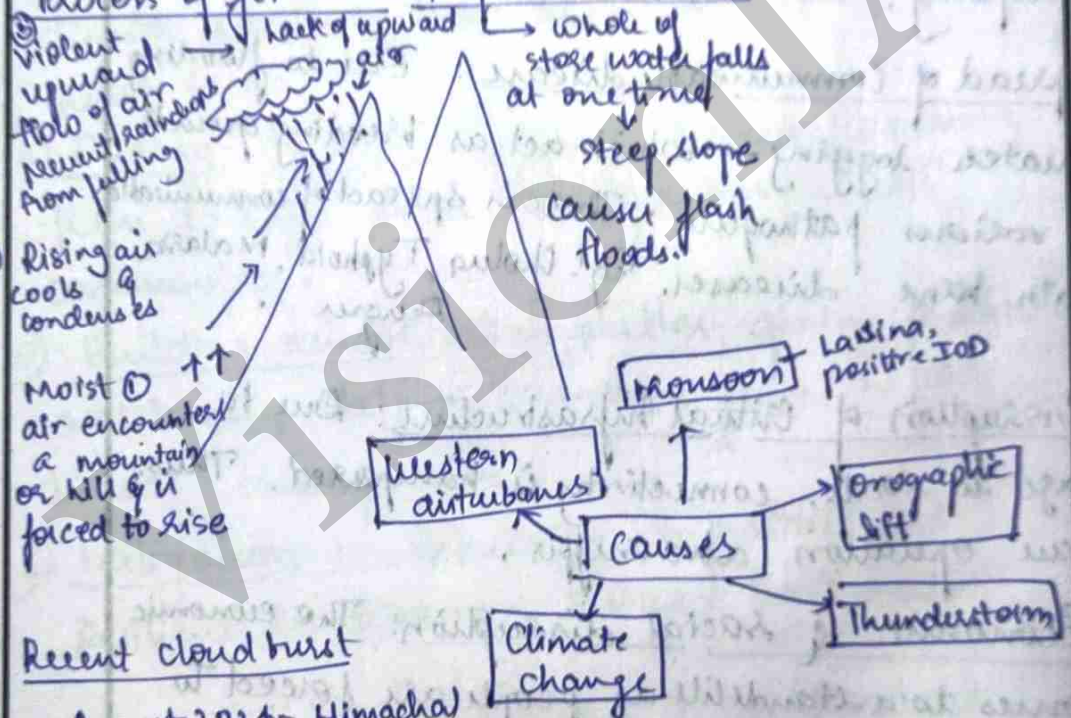
9] Spending on Research & Development to develop high yield pest resistant crops so that dependibility on fertilizers is reduced.

Since 54.6% of Indian population's main occupation is agriculture - thus their impact on environment is significant. Without their contribution tackling environmental degradation will be impossible. Thus, promoting sustainable agricultural practices is crucial.

17. बादल फटने की प्रक्रिया की व्याख्या कीजिए तथा उनके प्रभावों का उल्लेख कीजिए। साथ ही, बादल फटने के प्रभाव को कम करने के उपाय सुझाइए।
Explain the process involved in the formation of cloudbursts and state their impact. Also, suggest measures to reduce the impact of cloudbursts.

- A cloudburst is localised but intense rainfall activity that can cause widespread destruction especially in hilly regions.
- According to IMD, more than 100mm of rain in a hour over a area of 30-to sq km is called cloudburst.
- In India most prone regions are: Himalayan states, Northeastern states, Western ghats.

Process of formation of cloudburst:



Recent cloudburst
- August 2024 - Himachal Pradesh
- June 2023 - Arunachal pradesh.

* Coastal cities can also be effected as seen in Mumbai, Chennai floods 2015.

Impact of Cloudburst

1) Landslide: Due to sudden release of water & saturation of surface water level, hilly terrains, himalayan states are most prone for landslides.
Eg: Recent landslides in Wayanad Kerala, 2021 took 500 lives.

2) loss of Human life & property: Due to sudden impact & lack of time to respond, many people loose their life & there is huge loss of property.

3) Spread of communicable disease: Due to flooding & water logging — which act as breeding ground for various pathogen — There is spread of communicable water borne diseases. Eg: Cholera, Typhoid, Malaria, Dengue.

4) Disruption of Critical Infrastructure: Due to damage to roads, connectivity is hampered. Thus, Rescue operation also suffer.

5) Economic & social disruption: The economic comes to a standstill as people are forced to migrate (forced migration) — poor are more susceptible.

→ Various measures to reduce the impact of Cloudburst as given below:

1) Understanding the vulnerability profile of a geographical area - especially in Himalayan region & western ghats. Eg: Ecological sensitive zones to be demarcated & prevent the establishment of human communities like it seen in case of wayanad landslide.

2) Weather forecasting by IMD: Early warning systems to prepare for any such calamity to come.

3) Community capacity building: Educating & spreading awareness regarding the most common disaster possible in those areas & teaching them what to do.

4) During disaster: prompt rescue & moving them to safe places, participation of local communities.

5) Building rehabilitation shelter, giving financial assistance, help in recovering from the post disaster consequences.

6) Mitigation: Rebuilding infrastructure Resilient to Disaster - "Build Back Better"

* Cloudburst occur naturally & are frequent nowadays due to climate change. Thus, we should train & build resilient measures to tackle future disaster effectively & reduce their impact on human life.

18. समुद्री प्रदूषण के प्रमुख कारण क्या हैं? पर्यावरण पर इसके समग्र प्रभाव की विवेचना कीजिए।
What are the key causes of marine pollution? Discuss its overall impact on the environment.

Marine pollution, "includes a range of threats which includes those from land-based sources, oil spills, untreated sewage, heavy metals, persistent organic pollutants, heavy siltation, acidification, radioactive substances, overfishing & destruction of mangroves.

- India releases about 0.6 tonnes of plastic waste into oceans annually. & it ranked 12th among top 20 countries for marine pollution.

Key Causes of Marine Pollution

1) Oil spills - responsible for 12% of oil entering the sea. Rest comes for untreated sewage runoffs.
→ blocks photosynthetic capacity of phytoplanktons → affect biodiversity.

2) Fertilizer Runoff: Excess use of fertilizers in agriculture & run off caused due to flooding / degradation of mangroves → leads to excess nutrients reaching ocean → eutrophication → algal blood.

3) Solid garbage: Plastics from shores, rivers draining in ocean → they block the sunlight to reach the photic zone thus reduce total productivity of phytoplanktons.
Plastics are ingested by aquatic animals.

4) Sewage disposal: Many countries release untreated sewage water into ocean for disposal.
- can lead to eutrophication, biomagnification.
Eg: 80% of Beirut sewage discharge in Mediterranean sea.

5) Release of Radioactive waste: As recently alleged by China & S. Korea, release of water stored in Fukushima nuclear power plant by Japan – raising safety concern.

6) Degradation of mangroves: Mangroves act as natural filters for river run offs & thus protect marine ecosystem, but due to continued degradation of mangroves → leads to marine pollution.

7) Spread of invasive species: due to transboundary shipments many new invasive species are introduced at various location – thus endangering the local species.
Eg: zebra mussels.

8) Increasing level of atmospheric carbon dioxide – leads to acidification of ocean water → warming of ocean
→ damages biodiversity, coral bleaching.

9) Melting of glaciers due to global warming:- introduction of zombie virus → leads to threat to marine ecosystem.

10) Overexploitation of fisheries: physical degradation of marine ecosystem.

11) Release of heavy metals - biomagnification.

Steps taken to improve marine ecosystem:

→ United Nation Convention on laws of the sea, 1982: It governs rules for the use of ocean & their resources.

Part XI → International Seabed Authority: Regulates exploration & minerals of the seated outside the countries exclusive economic ~~Zone~~ territory.

→ Part XII – protection & preservation of marine environment.

→ MARPOL (Convection & protocol): to control pollution from ships.

→ High ~~Treaty~~ Sea Treaty: Yet to be ratified by India → for protection & preservation of ocean beyond EEZ. while safely exploring for minerals.

Overall impact of marine pollution:

→ Heating of Ocean → overall heat content of ocean increases
- ↓ accelerated climate change → more frequent cyclones & tsunamis
- ↓ degrades biodiversity.

→ Toxic accumulation in ocean → ingested by marine animals → biomagnification.
- ↓ loss of biodiversity.

⇒ Thus it is high time to take serious steps to prevent further damage & protect the oceans.

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

19. विभिन्न हितधारकों द्वारा किए गए कई प्रयासों के बावजूद भी भारत में नदी जल की गुणवत्ता में अधिक सुधार नहीं हुआ है। उदाहरणों सहित विस्तारपूर्वक वर्णन कीजिए।

There is a lack of significant improvement in the quality of river water in India despite multiple efforts by different stakeholders. Elaborate with examples.

- According to CPCB's latest report, 351 polluted stretches were identified on 323 rivers based on monitoring results of Bio-chemical oxygen demand (BOD) which is an indicator of organic pollution.
- Main cause of water pollution is release of untreated sewage water directly into rivers. This is a result of rapid growing urbanisation, industrialisation, lack of monitoring, lack of adherence to rules, use of fertilizers in agriculture.

Various schemes launched by Government of India are as follows:

1) Namami Gange Programme: A central sector scheme which aims to prevent pollution, conservation & rejuvenation of River Ganga.

2) National River Conservation Programme: Centrally sponsored scheme — to reduce pollution load in rivers through implementation of various pollution abatement works.

3) Water (Prevention & Control of Pollution) Act 1974:
This act led to setting up of Central Pollution Control Board at national level & State Pollution Control Boards at states.

Recent amendments have set guidelines by CPCB for appointment of director of SPCB.

→ New amendment has decriminalised many violations & set penalties of ₹10,000 - ₹15 lakh.
→ Penalties imposed on head of department in any violation of guidelines.

4) National Water Quality Monitoring Programme:
Under this program → continuous assessment of water quality. Setting up of monitoring networks across various location. spread across 28 states & 7 UTs.

5) National Water Policy 2012: Conservation of river corridors & water bodies & ensuring industrial effluents, residues of fertilizers do not reach the rivers.

Despite these measures, there is lack of significant improvement in the water quality of rivers.
This can be attributed to following reasons:

1) Lack of funding: various schemes, the funds allocated are released very late or are not used efficiently.

2) Lack of monitoring:
• Lack of technology, infrastructure, dedicated institution for monitoring water quality at various levels & ensure the timely information regarding quality of water.

3) Low capacity:
The current capacity of sewage treatment plants

is inadequate to tackle the enormous sewage generated in various metropolitan cities.
Only about 40% of water/sewage is treated & rest is released untreated due to incapacity of sewage treatment plants.

4) Quality of sewage treatment plant:
Ensuring the quality of water released post treatment is suitable to be released

5) Agricultural runoffs:
Excessive use of fertilizers & injudicious use of water in water intensive crop without acknowledging the capacity of soil has led to soil degradation & fertilizer run off to rivers leads to eutrophication thus harming the aquatic ecosystem.

6) Riverside pollution:
Especially at popular religious places - release of garbage into river has led to pollution.

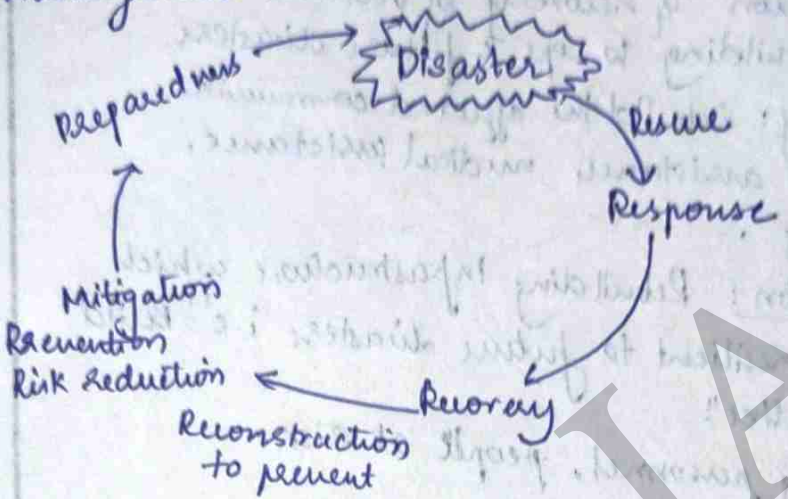
In India's scenario, one of the water stressed country & largest agrarian population, rivers are the life line of the country.
Thus ensuring quality of water in the river is of utmost importance.
Investment in water quality → promoting WASH (water, sanitation, hygiene) ~~outweigh the~~ the benefits repeated reaped would outweigh the investment.

20. प्राकृतिक आपदाओं एवं प्राकृतिक संकटों के बीच अंतर स्पष्ट कीजिए? आपदा शमन और प्रबंधन में शामिल चरणों की विवेचना कीजिए।

How do you differentiate natural disasters from natural hazards? Discuss the stages involved in disaster mitigation and management.

- Though many a times "disaster" & "hazard" words are used quiet interchangably, there lies a significant difference in their meaning.
- Natural hazards are predisposing factors/circumstances, in the natural environment that have the potential for future disasters (harm to person or property). These are either swift or permanent aspects of the respective environment setting like currents in the ocean, steep slopes, hilly terrain, unstable soil in Himalayan region or extreme weather conditions.
  → They can be classified as geophysical (earthquakes, tsunami, landslide), climatological (heat waves, hailstorms), meteorological (cyclones),
- Natural Disasters are unfavourable event caused from natural processes of the Earth like floods, Earthquake, tsunami, hurricanes, tornadoes, tsunamis
  → They are usually large scale, sudden & cause widespread loss of lives, damage of property & disturbance of social life.
  → Any event can be classified as disaster when the magnitude of destruction & damage caused by it is very high.

There are various stages involved in Disaster mitigation & management.



There are broadly 3 stages of Disaster Mitigation & Management

1] Pre-disaster Management:

i) Prevention: This stage involves identifying potential hazards & taking steps to prevent & minimize it.
Eg: Building codes, Early warning system, land use planning.

ii) Preparedness: This involves developing plans & procedures to be followed in case of disaster.
Developing evacuation plans, stocking of food & other essential emergency supplies, training people.

2) Response to Occurence of Disaster:
→ During disaster, rescue & relief operation - such as evacuation, construction of shelter & relief camps, supplying clean water, food, medical supplies, clothing, should be done on emergency basis.

3) Post disaster operation:

- Rehabilitation & Recovery of victims,
- capacity building to cope future disasters

• 1) Recovery: Rebuild the affected communities. financial assistance, medical assistance, counselling.

2) Mitigation: Rebuilding infrastructure which should be resilient to future disasters i.e "Build Back Better".

→ training personnel, people at risk.
→ Mock drills.
→ Using building codes for construction.

• Training local organisation
↓
Ministry of Panchayati Raj - introduced Disaster management at Panchayat level.

* In India, National Disaster Management Act led to the establishment of National Disaster Management Authority, nodal agency to act in case of disasters in India, which is headed by Prime Minister.