



**An Institute for Civil Services**

**IAS TOPPER'S**

**TEST COPY**

**POOJA YADAV**

**Rank - 174**

**GS Mains**

**Environment & Disaster Management**

**ENVIRONMENT & DISASTER MANAGEMENT**

Time Allowed: 3 hrs.

Max. Marks: 250

Q.	Marks	Instructions to Candidate
1.		<ul style="list-style-type: none"><li>There are 20 questions.</li><li>All questions are compulsory</li><li>The number of marks carried by a question is indicated against it.</li><li>Answer the questions in <b>NOT MORE THAN 200</b> words each. Contents of the answer is more important than its length.</li><li>Answers must be written within the space provided.</li></ul> <p>Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly struck off.</p>
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Name PooJA YADAV

Roll No. \_\_\_\_\_

Mobile No. \_\_\_\_\_

Date \_\_\_\_\_

Signature PooJA

1. Invigilator Signature \_\_\_\_\_

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# REMARKS

**GS SCORE**

GS MAINS TEST SERIES 2018

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Q1. What do you understand by Biological control? What are the different methods of pest control in organic farming? Critically analyse the suitability of Biopesticides in pest management with respect to altering needs and changing climate. (12.5 Marks)

Integrated PM

Biomagnification etc.

~~Agriculture requires huge investment (labour) as well~~

Agriculture is affected by many factors. One such factor is infection by pests, growth of weeds, diseases etc.

Biological control is a method of controlling the negative factors like pest growth attack by using biological agents.

Acc to FAO, most of the loss associated with agriculture occurs in the initial stages.

Biological control is a promising investment in agriculture.

Some methods under it are -

1) Integrated Pest Management - Here, pests are tackled by other organisms like lizards etc.

The added organisms cause no harm to the crop.

eg - Red spider mite is attacked by IPM.

2) Crop rotation - Organic farming relies on conservation agriculture. It - crop rotation allows soil to retain a balanced nutrient mix avoiding pest attack by pests.

Remarks

- 3) Mixed cropping - Leguminous crops are grown along with the cere crop. This allows balanced nutrients & avoids pest attack.
- 4) Inter cropping - Growing other crops in between major crops leaves little space & nutrient for pest attack.
- 5) Use of biofertilizers - Organic farming uses biofertilizers which don't disturb the soil by additional N, P, K & prevent attack.

Organic farming, thus can give better yields & at the same time it is based on the principle of health (People, soil, environment).

India is still losing tonnes to such controllable events. Biopesticides come with advantages like -

- 1) Soil fertility is maintained.
- 2) Cost friendly & farmer friendly.
- 3) Easily available pests in IPM.
- 4) No harm to the crop - thus better yield.

#### Disadvantages -

- 1) Lesser knowledge among farmers for application of biopesticides.
- 2) Biopesticides not available in all rural areas.
- 3) Farmers succumb to the lucrative MSP & adopt monoculture which leaves less scope alongwith fertilizer/pesticides applications.

Remarks

Q2. Rapid industrialisation in India has not only led to the economic development, but to severe pollution of our natural resources. What are the major environment degradation effects of industries? What are different water treatment strategies? Comment on some major recent initiatives taken by government to reduce liquid discharge from industries.

(12.5 Marks)

The 1991 reforms started a new era in India - Liberalisation, Privatisation & Globalisation. It opened the way for many industries & India today, enjoys a global position - 100th rank in Ease of Doing Business.

With development, come associated negative externalities. The world is witnessing climate change & India will be one of the worst affected countries.

Industries have contributed to the degradation in following ways -

- 1) Deforestation - need land for setting up industries
- 2) Pollution - (i) Discharge effluents into air  
 ii) Need water for cooling reactors & discharge it into water raising temp & affecting aquatic life.  
 iii) Heavy metals like lead, Mercury reach soil & enter food chain.

- 3) Biodiversity - Habitat degradation has reduced many species.

(Amazon forest - best example of degradation & species loss)  
 - Terrestrial & aquatic animals dying due to reduction in prey, chemicals in food.

Remarks

4) Climate change - Forests serve as  $CO_2$  sink which are now lost, adding tonnes of  $CO_2$  into air

Water is an essential input required & there are strategies to reduce its harmful effect

1) Water treatment plants - effluent treatment plants for industries, which extract major toxic metals before discharging into rivers.

2) Coolants:- water used for cooling machines treatment is cooled down to normal temp before discharging into rivers.

3)

The government has taken many initiatives to control water pollution & there are many such steps for industries.

1) Industries are required to treat water before discharging.

2) Industries contribute to Corporate social responsibility for social welfare & neutralising their negative impacts.

3) Bharat Narmada - are required to be followed by industries.

A healthy environment is required for economic development.

Remarks

Q3. Explain how extending urban boundaries are bringing microclimatic changes particularly about its thermal structure? What are the steps taken to mitigate such problems? What do you understand by green buildings and what is their utility in improved urbanization and resource management? (12.5 Marks)

Urban Heat Island effect  
Urban sprawl

More than half of the population stays in cities which contribute 70% to the GDP.

Urbanisation is the process of growth of cities, movement of people into cities.

But urbanisation in India is definitely un-regulated and suffers from many problems.

1) Urban sprawl - The urban boundaries are extending to the nearby rural areas are getting affected. In order to

2) Urban Heat Island effect - The temp in cities is higher than the surrounding areas, which owes to high buildings, poor planning, low tree cover etc.

3) Pollution & diseases.

4) Rise of slums & crime.

Citizen cities are essentially the engines of growth & certain steps are taken -

- Green buildings - GRHA assesses the urban habitats on the basis of their <sup>reducing</sup> GHG contribution.

- Urban planning - Smart City, AMRUT are centred around better cities which are regulated & have appropriate green cover.

Remarks



3) Empowering ULBs - The urban local bodies are given greater power as they are closest to the people & address problems better.

4) Green Highway Mission - It envisages to plant trees along highways and offer a better life to citizens.

With scientific community accepting that climate change is reality, a new concept of green buildings has emerged.

Multi-story buildings contribute to many negative externalities like ~~green~~ high temp (multiple surface for reflection), add to climate change due to the structure & material used.

GRIHA - Green Rating for Integrated Habitat Assessment by TERI is one such way that rates buildings on the basis of their contribution to negative externalities.

Green buildings promise a regulated urbanisation & better climate to the people in ways like -

- Adoption of solar rooftops.
- Proper tree cover - rooftop gardens etc.
- Use of less environment friendly material - avoiding concrete etc.

Climate change requires a collaborated effort.

Remarks

Q4. What are various urban wastes? What are the different steps involved in solid waste management in municipal areas? Elaborate upon the major problems faced due to urban waste dumping sites and explain how improved regulations on urban waste dumping will bring a relief. (12.5 Marks)

Waste is any material which is discarded after use. It is of many types - sewage waste, e-waste, dry waste, solid waste etc. 62 million tonnes of urban waste is added annually of which only 19% is treated. A rest goes to environment to cause its effects.

Solid waste comprises mainly of household waste. The govt has come up with new solid waste management rules, 2016.

Steps which are to be taken as per new rules -

- 1) Segregation of waste at source by households.
- 2) Collection by municipalities.
- 3) Using biodegradable waste for making compost, biofuel etc.
- 4) The other waste is treated & the leftover is discharged into landfills (which are supposed to be away from residential areas).

There are separate rules for e-waste & fecal sludge management.

Despite proper guidelines, waste management is a big problem because -

Remarks

- 1) Segregation at source is not done.
- 2) Households dump the waste wherever they find a vacant place.
- 3) Most of the management is done by informal sector - ragpickers.
- 4) Landfills are over-exploited, No to new landfills available.

Waste leads to multiple problems like -

- 1) Bad odour, flies & diseases.
- 2) Certain substances leach into the soil & pollute the groundwater.
- 3) Collapse of landfill slides - recently seen in Delhi.
- 4) Animals consume the waste which lead to their deaths.

The new guidelines promise some relief -

- Co owner of segregation is on waste generator.
- Burden is reduced for collector.
- Segregation into 6 categories will reduce the harmful effects & lead to better utilization.

Certain suggestions can be followed -

- 1) PPP model can be employed & people should agree to pay a nominal amount for a clean environment.
- 2) Waste collection must be on regular basis rather than demand.

Remarks

Q5. What do you understand by Geoengineering? Elaborate upon the major strategies that can be developed to contain the elevated ranges of temperature in geoengineering? Critically analyse whether geoengineering would be a climate panacea or anthropogenic catastrophe. (12.5 Marks)

Remarks

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*Remarks*

Q6. Elaborate upon the role of UNFCCC in reducing impacts of climate change and introducing sustainable development? What are the benefits that countries like India can gain from Kyoto protocol and its mechanisms? How the Paris climate agreement has created new roadmaps for global environment governance? (12.5 Marks)

Kyoto  
Paris

United Nation forum for Combating climate change is a international organisation which brings the global communities together for a bigger climate change.

Conference of parties are organised under UNFCCC which has given the world certain treaties like Kigali and Paris climate agreement.

The Kyoto Protocol was a result of efforts of global community and it was signed in 1997. The 2nd commitment period of Kyoto protocol will end in 2020.

Paris climate agreement will succeed the Kyoto Protocol, by providing a roadmap to tackle climate change in the post-2020 period.

India can achieve from Kyoto Protocol in following ways.

1) Kyoto Protocol recognises the needs of developing nations & their efforts in rationalising the climate energy mix.

It is based upon CBDR - Common But differentiated responsibility.

Remarks

2) India can gain experience, technology transfer and move towards greening fossil fuels.

3) Kyoto Protocol has different mechanisms like carbon certificates, technology transfer which can help Annex-II countries like India.

Paris Climate Agreement will replace Kyoto Protocol.

- It sets a roadmap & brings together the entire global community for keeping the temp below rise below  $2^{\circ}\text{C}$  from pre-industrial levels.
- It further tries to keep it below  $1.5^{\circ}\text{C}$ .
- It has a mechanism of funding, whereby developed countries are required to provide funding to developing & underdeveloped countries to move towards a greener path.
- It is based on CBDR.
- It recognises the needs of the developing nations and is structured towards the developed countries which had caused the maximum harm in the form of climate change.

These agreements alongwith Kigali agreement are well-laid & show the responsiveness of the global community. If implemented well they can regulate global warming & Climate Change.

Remarks

Q7. What are the different procedures of Environment Impact Assessment? Discuss the role of health impact analysis and public participation in impact analysis? Elaborate upon the role of CPCB and SPCB in EIA of different sectors. (12.5 Marks)

Environment Impact Assessment is analyzing the consequences a project has on the environment.

The Ministry of Environment, Forests & Climate Change released EIA notification in 2006 which makes it essential to conduct an EIA before starting a project.

Certain steps -

1) Screening - It involves deciding whether a project needs an EIA or not.

Certain projects like expansion of established highways are exempted.

2) Scoping - Here, an EIA is prepared and its impacts are analysed. Necessary mitigation measures like changing site, raw materials are suggested.

3) Submission of EIA to SPCB

4) Public Hearing - SPCB publishes a notice in the newspaper & stakeholders can put forward their concerns.

5) No objection certificate from SPCB & EIA is signed by MoEFCC.

EIA has brought a revolution in the development process by regulating it.

Remarks



Public Hearing is an important clause where the real beneficiaries / sufferers address their concerns and approve / disapprove a project. People always know the challenges better and are the real stewards of the natural resources, so their consent is required.

Likewise, health analysis done by committee is much required as industries are known to have caused great health impacts - release of lead, mercury & diseases associated HAI HAI etc.

It provides proper mitigation measures & address the issues.

S&CB & CP CB play an important part in organising a public hearing where a discussion occurs & concerns are addressed.

Thus, they have been playing their role well. In fact, public hearing is the most important part of an EIA.

Remarks

Q8. India has sample coal reserve but still it suffers coal inefficiency for power generation, explain why? What are clean coal technologies? Discuss how mega thermoelectric power plants are helpful for energy future of the country. (12.5 Marks)

ash content  
coal washing  
sequentially

India has abundant reserves of all grade of coal variety. Coal is a sedimentary product formed after years of degradation of organic material.

KG basin, Kutch, Peninsular plateau has many coal sites but the coal inefficiency is due to -

- 1) High ash content in coal ; imported coal has lower ash.
- 2) Sulphur content is not appropriate.
- 3) Technology is not available for harnessing coal found at depths.
- 4) Growing pressure on coal plants to reduce production due to green treaties

The treaties for tackling climate changes have introduced the concept of clean green coal technologies, which are an attempt to minimise the negative effects of coal usage.

Coal causes - Pollution (fly ash)

- Burning releases effluents in the air ( $\text{CO}_2$ ,  $\text{CH}_4$ , etc)
- Cost to nature & resources while transportation & degradation of land due to machinery & <sup>power</sup> plants etc.

Remarks

Clean coal technologies include -

- 1) Washing coal before usage
- 2) Carbon sequestration - for storing carbon dioxide released in underground sites, unutilised oil reservoirs, coal seams etc.
- 3) Carbon capture & utilisation - uses the carbon in oil extraction etc.
- 4) Covering the trucks with tarpaullin while transporting to avoid fly ash.
- 5) Fly ash policy - use in laying roads, dams, concrete etc.

Clean ~~carbo~~ coal technologies can neutralise the negative externalities in a big way.

Electricity is the fuel for running industries, lives & the economy.

~~This~~ Megathermal power plants are required for a country where most of the rural areas are yet <sup>to be</sup> electrified despite years of <sup>investment</sup> under Aharin Jyoti Yojana.

Clean coal technology is a win-win for the energy future and the development of the country.

Remarks

Q9. What are the different forms of gaseous fuels? Evaluate the prospects and challenges of using CNG as a cleaner fuel in India. Discuss the utility of shale gas in conserving the global energy prospects. (12.5 Marks)

Fuel is required for industries (electricity), households (cooking fuel, electricity etc.) It occurs in various forms - solid, liquid & gas.

Gaseous fuel is the one where it is compressed in the form of gas and supplied through pipelines.

Some important forms of gaseous fuel -

- 1) LPG - Liquefied Petroleum gas
- 2) CNG - Compressed Natural gas
- 3) LNG - Liquefied natural gas.

These fuels are being promoted in government schemes as they are cleaner.

CNG is a popular fuel.

#### Advantages

- 1) It doesn't cause any pollution.
- 2) Easy to transport & store as it is very light.
- 3) It can be used for vehicles & regulate vehicular pollution.
- 4) It can help to tackle climate change & keep the commitments of Paris Agreement.

Remarks

Challenges

- 1) CNG is costlier - everyone can't afford
- 2) CNG fuelling stations aren't available everywhere
- 3) The containers used for storage of CNG are very big and are difficult to handle.

The global scenario & relationships have changed after the discovery of shale gas which is a clean fuel and has changed both the energy mix & the international equations -

- 1) India has certain shale gas reserves - KG basin, Assam, Barmer etc.
- 2) It will reduce import bills as India doesn't have much oil.
- 3) India has abundant gum which is a critical input for the shale gas.

The world has shale gas reserves in US, China etc. Being a cleaner fuel, it can help control & keep climate change within limits. It can rationalise the oil politics and help in development of the entire world with cooperation & trust.

Remarks

Q10. What are several types of biofuels? How microalgae based biofuel can answer major challenges of Biodiesel production in India? Critically evaluate the flex fuel policy of Government of India. (12.5 Marks)

Biofuels are fuels which are produced from biological / living materials - crops, crop residue, algae etc.

There are various types of biofuels.

- 1) 1<sup>st</sup> generation biofuel - derived from crops like maize etc.
- 2) 2<sup>nd</sup> generation biofuel - derived from crop waste like rice stubble etc.
- 3) 3<sup>rd</sup> generation biofuel - derived from algae & bacteria.

The debate of fuel vs food is countered by the technology of producing microalgae based fuel.

It can address many issues in following ways -

- 1) It is a cleaner fuel.
- 2) It is produced from algae which is not of much economic importance.
- 3) It can help control climate change.

Yet the technique is not much developed in India and <sup>lot</sup> needs to be done to

Remarks

leads towards this path of Bioethanol, Bio  
diesel - Cleaner fuel.  
Punjab has come up with first such plant  
which shows the efforts of the country.

Remarks

Q11. Solar power in India has larger array of prospects yet it faces staggering enormity of impediments. What are the types of solar power plants in India? Comment on some of the challenges that National Solar Mission faces today. List some of the initiatives that India has taken to boost up the solar power sector. (12.5 Marks)

India being a tropical country has much scope for harnessing solar energy. The INDC commitment of India of 175 MW by 2022 can't be achieved unless a proper energy mix with a good share of solar energy is implemented adopted.

Most common type of solar power plants -

- 1) Rooftop solar plants - adopted by individual households on their rooftops.
- 2) Large centralised plants - Most of the plants in India are centralised & are created on large fields.
- 3) Solar tree - designed by CSIR is an innovative way for maximising energy & minimising land usage.

India through National Solar Mission envisages to adopt solar technology in its agenda, promoting rooftops in govt buildings & households.

It suffers from challenges like

- 1) Most of the plants are centralised and access is limited to few.

Remarks



- 2) High price of domestic solar panels & the China - India tussle over import of panels make solar technology costly.
- 3) Rooftop solar panels are not adopted in convincing numbers.
- 4) Initial cost of installation is high.
- 5) Lack of expertise in rural areas.

Government has been trying to promote this sector by overcoming the lacunae.

- 1) So Solar Kaitias - for training people in adopting solar technology.
  - 2) Jawahar Kal Nehru Solar Mission.
  - 3) Govt departments are adopting solar energy panels.
  - 4) Target of 175 MW by 2022 in India's INDC.
  - 5) Achieving 40% energy from renewable sources by 2030.
  - 6) Reverse bidding
- Solar energy promises a bright and better future to all as solar energy is available to all.
- Germany model - of decentralised solar plants should be adopted for a better & brighter India.

Remarks

Q12. Oil spills has a devastating impact especially on marine life. In this reference, explain how they impact the marine ecosystem? What are various measures to contain pollution from oil spill? (12.5 Marks)

Oil spill ~~as~~ refers to the release of hydrocarbon from tankers, ships into the environment.

Kamarajai Port witnessed collision of ships & oil spill this year.

Oil spill affect the marine ecosystem in following ways -

- 1) Oil forms a layer on the water surface, reducing the sunlight for organisms.
- 2) The photosynthesis rate is reduced and marine organisms die due to depleted  $O_2$ .
- 3) When consumed by animals, the toxins kill the organisms.
- 4) It leads to growth of invasive species and affects biodiversity.
- 5) It can affect coastal organisms and population by reaching the shore ~~to~~ can.
- 6) Enters food chain & affects humans..

The incidents of oil spills are not new, yet it is very ~~set~~ irresponsible on India's part as it doesn't have a law on oil spill control.

Remarks

Measures & arrangements to control oil spill -

- 1) National oil spill - disaster contingency plan (NOS-~~dis~~) gives the mandate to Coastal security guard in events of oil spill.
- 2) India ~~has~~ is a signatory to Bunker Convention which provides appropriate & timely compensation to ~~suffer~~ victims.
- 3) Oilzapper by TERI can lock the oil spill & minimise damage.
- 4) Use of nanosheets and gelators can control the damaging effects.

~~5) There are~~

Bioremediation - use of biological organisms to degrade toxins into less harmful ones or completely degrade it.

The ship owners, producers should be more careful and must report pro-actively in case of such events to avoid costing to lives and GDP.

Remarks

Q13. Western Ghat is one of the most significant biodiversity hot spot in the world. In this reference, discuss the importance of Western Ghat for India. What are major recommendations by Kasturirangan Committee to save and conserve the Western Ghat and discuss steps taken by government in this direction? (12.5 Marks)

India has 4 hotspots, one of which is the Western Ghats which spans across 6 states.

There have been debates about development & conservation of Western Ghats.

The debate is important because Western Ghats have significant importance -

1) Home to biodiversity - Plants & animal species are found.

Western Ghats have maximum frog species.

2) Endemism and genetic variability occurs.

3) Many rivers pass through Western Ghats. Development projects can obstruct & change the natural paths leading to greater inter-state disputes.

4) Have many minerals & resources.

The debate and discussions about declaring Western Ghats as ecologically sensitive areas is ever going.

In this regard Kasturirangan Committee has come up with certain recommendations.

Remarks

- 1) Declaring 37% of Western Ghats as ESA.
- 2) It empowers the local government to start development projects.
- 3) It is against the earlier committee's suggestion to declare entire Western Ghats as ESA.
- 4) It equally empowers the citizens.

Government has taken steps for conservation

- 1) Mandating EIA for development of projects.
- 2) More power to local bodies.
- 3) Govt has recognised forest cover in 14th finance commission (7.5% weightage)
- 4) CSR responsibility / obligation on corporate organisations.
- 5) Recognised the rights of tribals in forest rights act.

Western Ghats are a resource for all and a balance is needed between development and conservation. A decision on how much area should be declared as ESA should be taken soon & states should be liberal as other areas are available for development.

Remarks

Q14. India is home to some of the most polluting cities on earth? Identify the reasons and elaborate on the measures taken by India with respect to air pollution? (12.5 Marks)

According to WHO - 13 of the 20 most polluted cities in the world are in India & Delhi is at the top in the list -

Another report mentioned, India has surpassed China in terms of air pollution.

The Delhi smog in India every year is a manifestation of the air pollution.

Reasons for air pollution -

- 1) Industrialisation & discharge of effluents in the air.
- 2) Vehicular pollution - More income with the middle class has led to surge in private transport.
- 3) Stubble burning in Punjab, Haryana - responsible for Delhi smog.
- 4) Use of ~~not~~ wood, coal in villages as fuel.
- 5) Reduced forest cover - Carbon sink is reduced.

Govt has ~~set up~~ <sup>taken</sup> certain measures -

- 1) Air pollution act was - passed in 1986 to regulate & control air pollution.

Remarks

- 2) CPCB & SPCB was set up under the Environment Act, 1986.
- 3) The NAT Act was passed which led to formation of National Green Tribunal which adjudicates cases related to air pollution.
- 4) Bharat Norms IV will be adopted by 2017. It is similar to Euro norms.
- 5) Fitting industrial chimneys with filters.
- 6) Cleaner fuel is promoted through Gjajawala Yojana.
- 7) Pollution norms & cleaner sulphur free, lead free norms.
- 8) Govt is promoting electric vehicles.
- 9) Odd-even policy by Delhi govt to control pollution in Delhi.
- 10) Ban on stubble burning in NCR by NAT.

The steps indicate the consciousness of the govt and the citizens towards achieving a cleaner environment.

India should emerge as a leader in the world community & set examples for others to follow.

Remarks

Q15. Capacity building is the most important aspect of pre-disaster preparation to mitigate the impact of disaster. In this light, discuss the various levels and methods of capacity building. (12.5 Marks)

Capacity building refers to increase in capability of people, institution overtime by addition of knowledge & experience.

India is a disaster prone country and the UN efforts, alongwith committees formed after super cyclone led to passage of NMA Act in India in 2005.

Most essential effective intervention in disaster management occurs at the pre-disaster preparation stage which involves mitigation & preparedness.

Both mitigation & preparedness are related and are enhanced by capacity building.

Capacity Building has been focused in Sendai framework and other national & international initiatives.

It can occur at different levels -

1) Institutional - Authorities responsible can learn from past & by collaborating with international organisations.

Remarks



2) Community level - The community can be more aware by making appropriate use of media, internet.

Moreover, community is the first to respond, it can develop its traditional techniques with a blend of technology & provide essential input in preparedness.

3) Individual level

Certain methods of capacity building -

- 1) Awareness programmes among people.
- 2) Use of ICT and learning from past.
- 3) International collaboration & discussions.
- 4) Mutual co-operation & gaining experience.
- 5) Including women into leadership & learning techniques.

Preparedness is the entire country's readiness -

to deal with a disaster as & when it strikes. It requires a stimulation at all the levels for a better prepared nation.

Remarks

Q16. Forest fires are fast becoming an important area of concern in India? Elaborate on the impact on local ecology? What factors are contributing to these forest fires? What measures are taken to prevent them? (12.5 Marks)

Uttarakhand & Himachal Pradesh witness forest fires every year & have lost many hectares of land to fires.

Forest fires are growing and it has become a national concern.

Forest fires affect the ecology in following ways.

- 1) It affects biodiversity. certain species of plants & animals are lost.
- 2) Pollution - release of gases into atmosphere
- 3) Growth of invasive species & disturbs the ecological balance
- 4) It spreads to residential areas & causes loss of life.
- 5) It hits the tourism industry.
- 6) Productivity of agricultural land is compromised, growth of weeds & attack by pests.

Thus fires cause huge loss to the country & the Govt alongwith the local ecology.

Forest fires are a natural phenomenon but anthropogenic interventions have enhanced the rate & intensity of fires.

Remarks

factors responsible -

- 1) Chir pine trees - The leaves are flammable & lead to fires.
- 2) Deliberate fire by locals for clearing bracts before sowing.
- 3) Tourists - leave matchboxes & cigarettes which lead to fires.
- 4) Migration - people migrating into cities for unemployment & unregulated growth of chir trees which are unused.
- 5) Climate change - Humidity and temp changes have increased fires.

There have been committees set up to regulate & control forest fires.

Measures that can be adopted -

- 1) Employment to people - as an incentive to stay back.
  - 2) Employment in picking up chir leaves & using for basket making etc.
  - 3) A national policy on fire can be adopted.
  - 4) Helicopters with methods to control fire.
  - 5) Empowering Promoting courses in fire management along with empowering forest officials.
- Fire is a controllable event with necessary intervention.

Remarks

**Q17.** The increasing industrialization increases the risk of industrial disasters. What effective steps must be taken to reduce industrial disasters? What lessons India can learn from its past experience in tackling such disasters? (12.5 Marks)

Industrialisation has definitely given development and better utilities but it is associated with certain industrial disasters.

Industrial disasters can occur at many stages like: operating, transporting, storage etc. They can be wide ranged - chemical, nuclear etc.

The world has seen certain big disasters like Chernobyl incident. The Bhopal Gas Tragedy had impacted India & led to govt. becoming shifting from a reactive to pro-active approach.

Industrial disasters are avoidable if appropriate interventions are taken.

1) Safety of workers to avoid occupational hazards.

2) Replacing old machinery.

3) Conforming to the industrial standards.

4) ~~Insurance to workers / compensation~~ A database to effectively note such past events & avoiding in future.

5) Trained team to deal with disasters.

Remarks

6) International collaboration & knowledge sharing.

90% of such incidents occur due to human error and thus India should move towards a path of human resource development & actively learn from past.

Bhopal Gas Tragedy had wide impacts on the victims, families & environment.

It should grade up & replace defective machinery with proper leak detection systems, regular inspection.

Disaster and development are tinked and can both create disasters and control disasters. It has to be channelised in the right way.

Remarks

Q18. Sendai Framework adopted during 3<sup>rd</sup> UN World Conference on Disaster Risk Reduction, in Japanese city of Sendai is the first major UN agreement on the post-2015 development agenda. In this regard discuss India's Post Sendai initiatives. (12.5 Marks)

Sendai Framework would succeed the Kyoto Framework Action & guide the world for the 2015-2030 time period.

The efforts for disaster management increased after UN declared 1990-2000 as the decade for disaster management.

India actively created NDMA after having incidents like : Super cyclone & Gujarat earthquake.

1) India hosted the Asian Disaster Managerial Conference and adopted the regional action plan for disaster management.

The outcomes of Asian Disaster Managerial Conference will guide India in the post-Sendai framework in implementation.

2) An MOU has been signed between JNU & NIDM for introducing a course in disaster management in JNU.

3) A national disaster response reserve has been created with revolving fund of Rs 200 crore.

Remarks

4) The NDRF has been strengthened ~~to~~ with state of art capacity building initiatives.  
 5) India is moving in the direction of global cooperation & help in case of disasters.  
 ex - Nepal Earthquake 2015.

6) Disaster management has been included in the school curriculum.

7) Leadership role for women are being promoted.

ex - National Cyclone Mitigation Programme  
 promotes leadership among women.

India is a disaster prone country and preparedness can help India to achieve its goals.

SDG - 13 advocates resilient infrastructure  
we and India should actively include

1. integrate all developmental programmes for a better disaster & risk management.

Remarks

Q19. Elaborate on the ill-effects of coastal pollution and coastal interference due to developmental activities and urbanization? Discuss how to mitigate such effects and examine the role of coastal regulatory zone in this regard? (12.5 Marks)

Coastal areas are a reservoir of biodiversity and natural resources. But lately problems like coastal pollution, coastal erosion & encroachment have been plaguing the area & leading to negative effects on the environment.

Reasons for increasing interference -

- 1) Industrialisation & encroachment
- 2) Clearing of sundri trees in sunderban for oil.
- 3) Encroachment by people, fishing community.
- 4) Tidal plants & encroachment.
- 5) Oil spills.

The ill effects are many like -

- 1) Biodiversity - species are lost & growth of invasive species can occur.
- 2) Death due to toxin accumulation by marine organisms.
- 3) Food chain ~~& human~~ - The toxins enter food chain & human health is affected.
- 4) Fishery - fishing community is affected due to fewer catch.

Remarks



5) Enhanced climate change due to reduced Carbon sink.

These effects can be mitigated in following ways -

- 1) Structural interventions like building walls to avoid encroachment.
- 2) Regulation in the form of Coastal regulation zone management.
- 3) Controlling & locking oil spills.
- 4) Awareness among people <sup>about effects of</sup> encroachment.

Coastal Regulatory Zones have been demarcated which regulate the type of activities that are allowed in different areas.

There are 4 CRZ and activities are regulated in these areas.

Remarks

Q20. Identify the major reasons for biodiversity erosion in the country and examine the role of national biodiversity action plan in containing the effects? (12.5 Marks)

*Remarks*

