

ENVIRONMENT - 1

Time Allowed: 90 min.

Max. Marks: 150

Q.	Marks	Instructions to Candidate
1.		<ul style="list-style-type: none"> There are 10 questions.
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		<ul style="list-style-type: none"> All questions are compulsory. The number of marks carried by a question is indicated against it. Answer the questions in 250 words each. All questions carry equal marks. $15 \times 10 = 150$ Marks Keep the word limit indicated in the questions in mind. Answers must be written within the space provided. Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly struck off.
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Name Vidushi Singh

Roll No. 40666

1. Invigilator Signature _____

Mobile No. _____

2. Invigilator Signature _____

Date _____

Signature Vidushi

REMARKS

GS SCORE
GS MAINS TEST SERIES 2022

- Q1. 'Bioremediation can be a part of the solution to addressing India's mounting problems with waste'. Briefly explain the process of bioremediation. Also, discuss its advantages vis a vis other methods of waste management. (15 Marks) (250 Words)

BIOREMEDIATION is the use of microorganisms (bacteria and fungi) to degrade the environmental contamination into less toxic forms. Microorganisms can be specifically designed for bioremediation through genetic engineering.

PROCESS of Bioremediation :

Bioremediation can be : ① IN-SITU
② EX-SITU

IN-SITU Bioremediation involves treatment of contaminated material at the site. E.g. Bioventing, Biosparging, OIL ZAPPER developed by TERI for treatment of oil spills.

EX-SITU BIOREMEDIALION → involves

removal of contaminated material

* good to be treated elsewhere.

(~~planter~~) composting, handfaering, bioreactors etc.

Advantages of Bioremediation

- 1. Destroys a wide variety of contaminants.
- 2. Less expensive than other methods of waste management

- 3. Environment friendly
- 4. Helpful in mass pollution curbs like oil spills.
- 5. Destruction of target pollutants is possible.

* Compares with other methods also.
* main theme of question

Remarks

However, there are a few limitations of bioremediation as well:

1. Works only on Biodegradable toxins.

2. Takes longer time than other waste management methods.

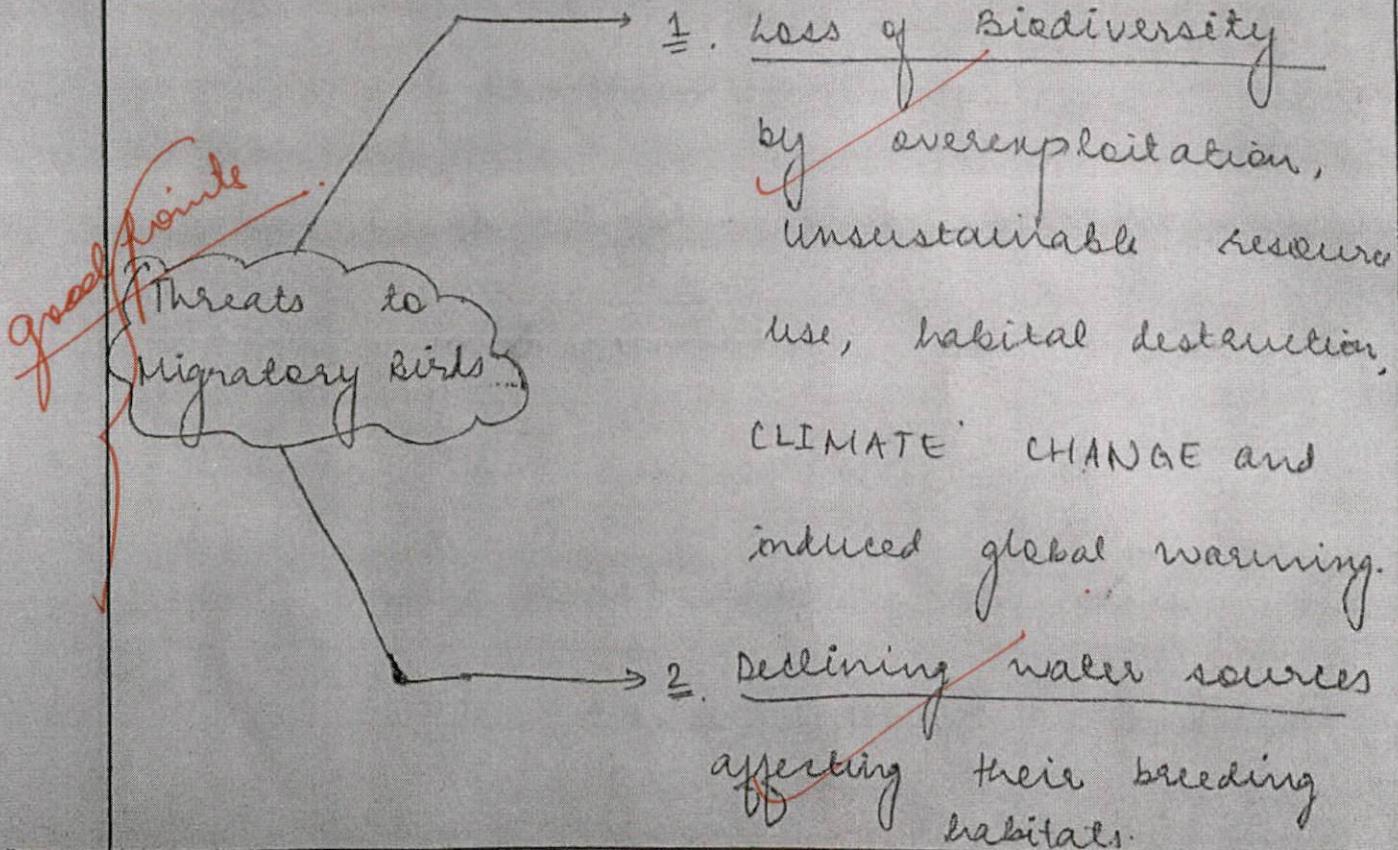
Thus, it is important to facilitate use of bioremediation with other waste management methods for a more effective and efficient curb on pollution. eg: Bioremediation +

Sewage Treatment plants in case of oil spills can fast-track the process of waste management.

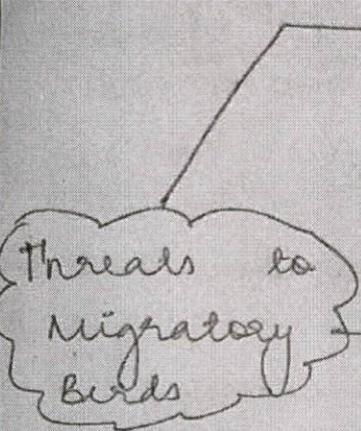
- Q2. Despite efforts like the Bonn Convention and CITES for their conservation, migratory birds are facing severe threats from human and climate related changes. Discuss. Highlight the initiatives taken by civil society and NGOs to save migratory birds. (15 Marks) (250 Words)

* ~~introduction~~ ~~MIGRATORY BIRDS~~ travel thousands of kilometers to find best habitats during extreme winters. Migratory birds come under international protection through BONN convention or CMS and CITES.

However, they are facing several threats.



Remarks



* relevant points
can add examples of
few birds to make it effective

Migratory Birds are an indicator species and crucial for ecosystem balance.

They help in pollination of plants, dispersal of seeds, etc.

Several measures by CSOs and NGOs to save migratory birds have been taken such as:

Remarks

1. Wetland International is a global not-for-profit organisation to conserve and restore wetlands, including

CHILLIKAI LAKE which has several migratory birds visitors every year.

2. Birdlife International is a global partnership of NGOs that strives to conserve birds and their habitats.

3. National Action Plan for conservation of Migratory Birds by MOEF

4. Central Asian Flyway through India.

5. World Migratory Bird Day

(OS) CMS and CITES and IUCN are global supervisors for conservation of migratory birds.

Remarks

- Q3. Oil spills often result in immediate and long-term environmental damage that can last for decades. Discuss the impact of oil spill on marine ecosystem. What are various measures to contain pollution from oil spill? (15 Marks) (250 Words)

OIL SPILL refers to leakage of oil from marine transport or during extraction process of oil. It can also occur onshore and offshore both.

(Impact of oil spill on Marine Ecosystem)

* good point Oil is lighter than water and therefore, after an oil spill, oil floats on water as a thin film. This cuts off the oxygen to phytoplanktons and other plants in the marine ecosystem.

∴ Within hours of an oilspill, the

~~fishes, shellfish, plankton, etc die~~
~~due to suffocation and metabolic~~
anomalies.

* ~~property covered on birds oil spills~~ Birds and Mammals, when consuming these dead species, also die due to poisoning.

The recent oil spill of Mauritius in 2020, spilled 1000 tonnes of oil into a sanctuary for a rare wildlife and affected the marine ecosystem adversely.

Measures to contain pollution from oil spill:

oil spill can be controlled by fast

Remarks

removal of film of oil over the water

1. Bio remediation : OIL ZAPPER

created by TERI can be used effectively to ensure reduction of oil toxins.

2. Burning of fuel / oil for faster reduction of oil.

3. Extraction of oil film from water surface

4. Solidifying by absorbing oil in tiny pellets of solidifiers.

As per Geneva convention (1958) every state must do its regulation to prevent pollution of seas through oil.

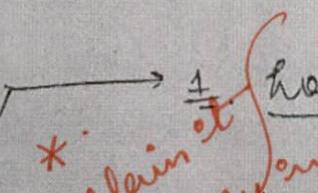
This needs to be followed through to ensure SDG - 14: Life Below Water is fulfilled.

Remarks

- Q4. The issue of gender-sensitivity is crucial for low carbon climate resilient planning at local, national and international levels. In this context examine the impact of climate change on the women in developing countries like India. (15 Marks) (250 Words)

good!
nicely addressed per As a new study by IPCC,
climate change affects women more
proportionately than men. Women
commonly face higher risks and
burdens in socio-economic perspective.
Climate - change leads to double burden
on women.

Impact of climate change on women
in countries like India:

Impact 
* explain it lower social mobility of
specifically women than men affects
context of change. They more harshly.

Remarks

2. Resources: Women

experience higher inequity

in terms of resource

allocation to them due

to ~~unmet~~ security of resources

(Impact) from climate change.

3. Water-fetching and household

chores are aggravated due

to ~~water stress~~ water - stress experienced

due to ~~water stress~~ several cities in India

get affected as ~~previous~~ Hazards ~~increase~~ living conditions

especially in urban slums

leads to several water-

borne diseases among women.

4. Food and Nutritional Security

required by ~~communities~~ is adversely affected due to gender-bias and lesser allocation.

Remarks

Impact → 6. Higher vulnerability and disease burden on women.

What should be done?

Measures

relevant suggestions

65%

→ 1. Gender- budgeting and effective allocation of resources for women to eliminate vulnerabilities.

→ 2. Behavioural change to reduce socio-economic bias against women.

→ 3. Integration of schemes through higher convergence
e.g.: BBBP + NCAP, etc.

→ 4. Reducing administrative inefficiencies.

It is pertinent to ensure women empowerment through realising SDG-5 to ensure better environment for all.

Remarks

- Q5. Biofuels, being a derivative of renewable biomass resources, have huge potential to help the country achieve its renewable energy goals. In this context discuss how the National Policy on Biofuels will help in creating an environmentally and economically sustainable energy sector. (15 Marks) (250 Words)

* BIOFUEL is any hydrocarbon fuel that is produced from an organic matter in a short period of time. Biofuels in India are of strategic importance as it aligns well with the existing govt. initiatives.

National Policy on Biofuels : (NPB)

National Policy on Biofuels - 2018

envisages a target of 20% of Ethanol Blending in Petrol and 5% ethanol blending in diesel by 2030.

⇒ NPB categorizes biofuels as 1G, 2G, 3G with different fiscal incentives

Remarks

under each category.

- * NPB expands scope of raw materials by allowing use of sugarcane juice, sugar containing materials and other types of biomass for ethanol production.

-) Viability gap Funding for advanced biofuels (24).

These points measures will lead to:

1. Reduced import dependency for fuel
2. CLEANER Environment by effective waste - to - energy technique.

3. Employment generation

1. Health Benefits: e.g. Ethanol blended

Remarks

* Biofuels have
it will be
environmentally
friendly, more friendly than
pure petrol or diesel, thus improving
air quality.

5. Sustainable: Biofuel is a sustainable
source of energy. ~~good~~

However, there are some impediments
to effective implementation of NPB:

1. Infrastructural deficiencies,

2. Administrative deficiencies,

3. Technological deficiencies, etc.

06 1/2

~~long term solution~~
~~can quickly address these~~
therefore, ~~address~~ ~~these~~ ~~deficiencies~~ is imperative to ensure
effective capacity building measures
for smoother and effective implementation
of NPB, which will lead to economic
and environmental sustainability.

Remarks

Q6. How could greater public participation in environmental conservation become an important tool for bringing distributive justice? Substantiate with examples.
(15 Marks) (250 Words)

* ~~good introduction~~ PUBLIC PARTICIPATION in environmental conservation is an important element in environmental decision making for several decades. It has been emphasized by RIO DECLARATION 1992 as well.

Role of public participation in environmental conservation for distributive justice:

* ~~bring justice~~ 1. Bottom - up approach with wider public demands being incorporated in environment policies.
~~bring justice~~ eg: Public consultation in EIA.

Remarks

2. Check on encroachment over ecologically

sensitive areas, eg: Narmada

Bachao Andolan, Chipko movement,

etc.

* Relevant points

3. Behavioural changes: wider public

participation ~~these~~ in environmental

conservation ~~contribute~~ can bring about behaviour

changes, eg: use of LED lights,

in micro irrigation techniques, etc.

* explain
factors
in bringing
positive

4. Accountability of government over

land acquisition and forest clearance

to the public, eg: Land Acquisition

law requires ~~community~~ consent.

5. Forest Protection and Forest Rights

preserved under FRA.

Remarks

5. Informed Decision Making with wider awareness among people,
 eg: EIA, ~~land acquisition~~, etc.

PUBLIC PARTICIPATION can be encouraged by mass movements like Swachh Bharat Abhiyan and Jal Andolan. In order to realize the importance of environment, public must amass requisite awareness

* for effective environmental policies

~~give short conclusion~~ aimed at higher degree of environmental conservation. Further PESA, 73rd & 74th amendment Acts should be used

effectively for SOCIAL AUDITS and wider participation.

Remarks

(OS)

- Q7. While forest fires are a recurring and common phenomena, their frequency has been on the rise in India. Discuss the major causes of frequent forest fires in Indian hilly states in the last few years. What measures can be taken to control this problem?

(15 Marks) (250 Words)

FOREST FIRES can be described as any uncontrolled combustion of plants in a natural setting. Since the advent of year 2021, there have been several incidences of forest fires especially in hilly states of India.

Causes of forest fires:

Forest Fires can be ignited by human actions or natural factors. 3 conditions are necessary for a forest fire : (1) Fuel ; (2) Oxygen & ; (3) heat source.

Remarks

Can give some finishing of
any report to substantiate

-) In India, Forest Fires are mostly common in months of March & April ~~when there is large quantities of dry wood, logs, etc.~~
-) In Uttarakhand, lack of soil moisture has been seen as a key factor ~~to ignite forest fires.~~
-) Man-made factors such as burning of dry leaves in Odisha caused forest fires in Simlipal forest in March 2021.
- * need to add more points
* more specific to hilly areas
Several studies have linked the cause of forest fires to climate change and global warming as well.

Remarks

Forests are important carbon-sink and reservoir of resources. Therefore, there is a need to take effective measures to control forest fires:

1. NAP on Forest Fires ensures to reduce the vulnerability of forests against fire hazards.
 2. Community participation to ensure no manmade factors lead to forest fires.
 3. Forest Fire Prevention measures to be effectively adopted.
 4. ~~aerial surveillance, GIS Mapping, firefighting reservoirs to mitigate Forest Fires.~~
^{imperative}
It is ^{imperative} to take measures to preserve the 'lungs of our ecosystem': FORESTS.
- ~~airplane~~
- ~~Remarks~~

05 1/2

- Q8. Recently, cloudbursts have been reported from several places in J&K, Uttarakhand and Himachal Pradesh. Highlight India's vulnerability to cloudbursts. What measures have been adopted to deal with this phenomenon? (15 Marks) (250 Words)

* CLOUD BURSTS are short duration, intense rainfall events over a small area. According to IMD, it is a weather phenomenon wherein precipitation exceeds 100 mm/h in 20-30 sq. km.

India's vulnerability to cloudbursts:

* It is seen that more cloudbursts are happening in hilly regions of J&K, Uttarakhand & Himachal Pradesh due to decadal temperature rise in Himalayan region.

-) In Indian Subcontinent, cloudbursts

Remarks

generally occur when a monsoon cloud drifts northwards from Bay of Bengal or Arabian sea across plains on to the Himalayan region:

- ~~good you have~~ Himalayan orography, hilly terrain and monsoon cloud, leading to heavy rainfall over India.
- Cloud bursts may lead to landslides, flash floods and heavy losses to life and property, as seen in February 2021 and in Kedarnath in 2013.

Measures to be adopted to deal with cloud bursts:

- Measures →
- 1. Weather mapping and forecasting efforts to gauge the probable consequences.
 - 2. Land use pattern profile to identify vulnerable regions.
 - 3. Afforestation Efforts to reduce chances of landslides
 - 4. GIS Mapping, Grange Atlas and other mapping efforts for holistic mitigation planning.
- * also add on
Disaster Management principle of India
- * satisfactory points

(06 1/2)

Cloudbursts bring heavy losses to life and property. Therefore, it is necessary to establish effective mitigation strategies for the same.

Remarks

- Q9. 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. (15 Marks) (250 Words)

UNISDR defines 'CAPACITY BUILDING' as process by which people, organizations and society develop capability over time to achieve social and economic goals. capacity building has also been emphasized by

Sendai framework as an important aspect of pre-disaster preparation.

levels and methods of capacity building

According to NDMA, in the process of capacity building, we must include

- * (1) Individual Training,
- (2) organizational development,

Remarks

(3) Institutional Development.

National Institute of Disaster Management (NIDM) is the capacity building arm at the national level in India. Further, several training institutes are also established to ensure capability enhancement at individual and organisational levels.

Methods of Capacity Building:

As per UNDP, 2 methods of enhancing capacities exist: FUNCTIONAL & TECHNICAL

1) Functional capacities are needed to formulate, implement & review

Remarks

policies, strategies, programmes.

-) Technical capacities are associated with particular area of need.
-) Engagement ~~with~~ of stakeholders is ^{relevant} ~~non-~~ essential for effective capacity building.
-) Moreover, these can be facilitated by technologies in terms of GIS, LIDAR, etc. for effective institutionalization for pre-disaster measures.

~~properly conducted~~ Capacity Building enhances the endurance towards disasters and minimizes & hedges the risks. ~~for~~ It ~~better~~ is essential for effective pre-disaster measures to minimise losses.

Remarks

Q10. Comment on the role of information technology (IT) in disaster management and cite some examples of successful use of IT in disaster management in India.

(15 Marks) (250 Words)

According to a report by UNDRR,
 India is ranked 3rd after US & China for recording highest number
 of natural disasters over the last
 2 decades. IT plays a crucial role
 in disaster management in India.

{Role of IT in Disaster Management
 (DM) in India:

→ GIS Mapping and
 building of VULNERA-
 BILITY PROFILE of
 India has helped in
 identifying more
 vulnerable regions.

Remarks

(Role of IT)

→ 2. Big Data and AI

help in augmenting potential losses and help in deriving an effective mitigation plan.

X good point add any specific info. in regard.

need to add with relevant examples

3. Geoinformatics Information and Transportation network data help in understanding human mobility patterns during disasters.

4. Early warning systems

especially after Tsunami in Indian Ocean in 2004 have enhanced pre-disaster measures in India.

add few opt.

Remarks

Role of IT

5. Technologies like LIDAR, GIS, GPS help in understanding the disaster pattern and its consequences.

* Add examples also

6. Internet plays an important role in disaster handling and information dissemination.

However, there are some challenges

posed by use of IT in terms of

* Lack of data sets for effective

Predictability, lack of R&D in

DM, Institutional and infrastructural

bottlenecks, etc.

(07)

* Therefore, capacity building + effective

PM strategies will compound the benefits

Remarks accrued from IT in DM.