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GENERAL STUDIES (TEST CODE : 1022)

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Medium Eng./Hindi	ENGLISH	Registration Number	5649
Center	ORN, NEW DELHI	Date	16/09/17

INDEX TABLE			INSTRUCTIONS
Q. No.	Maximum Marks	Marks Obtained	
1	12.5		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	12.5		2. There are TWENTY questions printed in ENGLISH & HINDI इसमें बीस प्रश्न हैं अंग्रेजी और हिन्दी में छपे हैं।
3	12.5		3. All questions are compulsory. सभी प्रश्न अनिवार्य हैं।
4	12.5		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	12.5		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 than 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	12.5		6. Word limit in questions, if specified, should be adhered to. प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए।
7	12.5		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।
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:			

75, 3rd Floor, Old Rajinder Nagar Market, Near Axis Bank, New Delhi – 110060

103, 1st Floor, B/1-2, Ansal Building, Behind UCO Bank, Dr. Mukherjee Nagar, Delhi – 110009

EVALUATION INDICATORS

1. Alignment Competence
2. Context Competence
3. Content Competence
4. Language Competence
5. Introduction Competence
6. Structure - Presentation Competence
7. Conclusion Competence

Overall Macro Comments / feedback / suggestions on Answer Booklet:

1.

2.

3.

4.

5.

6.

All the Best

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

12.5X20=250

1. What do you understand by seasonal shifting of pressure belts? What impact does it have on the formation of various climatic regions across the globe? Discuss its socio-economic significance.

वायुदाब पेटियों के मौसमी स्थानांतरण से आप क्या समझते हैं? विश्व भर में विभिन्न जलवायु प्रदेशों के निर्माण पर इसका क्या प्रभाव पड़ता है? इसके सामाजिक-आर्थिक महत्व की चर्चा कीजिए।

There exist along the earth's latitudes, four pressure belts. These are the equatorial low pressure belt, the subtropical high pressure belts, the subpolar low pressure belts, and the polar high pressure belts, in both the hemispheres. These are formed due to the apparent movement of the sun, between the tropics of cancer and capricorn.

As the sun moves northward and southward between the two solstices (ie tropics), these

pressure belts also move north and south respectively.

Impact on climatic Regions:

→ Causation of Monsoon - as sun moves towards the tropic of cancer, the ITCZ shifts northward around 20°N around Indian Subcontinent. This creates a pressure differential, which causes monsoon.

→ Mediterranean Sea - causes arid conditions in summer and rain in winter.

→ Although Saharan Africa is mostly dry, shifting of belts causes rain in the North-western part.

→ Middle and northern California experiences Mediterranean-like climate conditions due to shifting of pressure belts.

Socio-Economic Significance :-

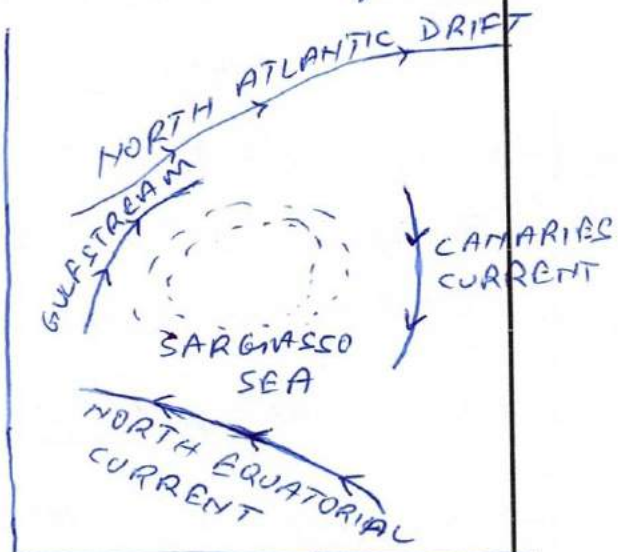
- Influences Agriculture and cropping patterns in India, which is the backbone of the economy.
- Leads to cropping of citrus fruits around Mediterranean region, which propels economy and tourism.
- Climate variability can be accompanied by weather prediction and suitable adaptation and mitigation.
- Enables cluster formation of population and human settlements around areas of water availability and economic activity.

2. Explain the reasons for the formation of Sargasso Sea. Also, examine the factors for it being a region with one of the highest ocean salinity.

सारगोसो सागर के निर्माण के कारणों की व्याख्या कीजिए। साथ ही, उन कारकों का भी परीक्षण कीजिए जिनके कारण यह उच्चतम महासागरीय लवणता के क्षेत्रों में से एक है।

Sargasso sea is a part of the NORTH ATLANTIC gyre, named so due to the unusually high presence of the seaweed 'Sargassum'.

It is bound by oceanic currents on all sides and doesn't touch land at any point.



Reasons for formation:-

→ The four oceanic currents (as in the figure) form a continuous body of water around leaving this sea in between with nowhere to escape.

→ The densities of the ocean currents leads to formation of this sea.

→ Coriolis Force turns water rightward in the northern hemisphere, causing a circular motion around this sea.

Reasons for high salinity:-

→ No access to fresh water as the sea is cut off from land.

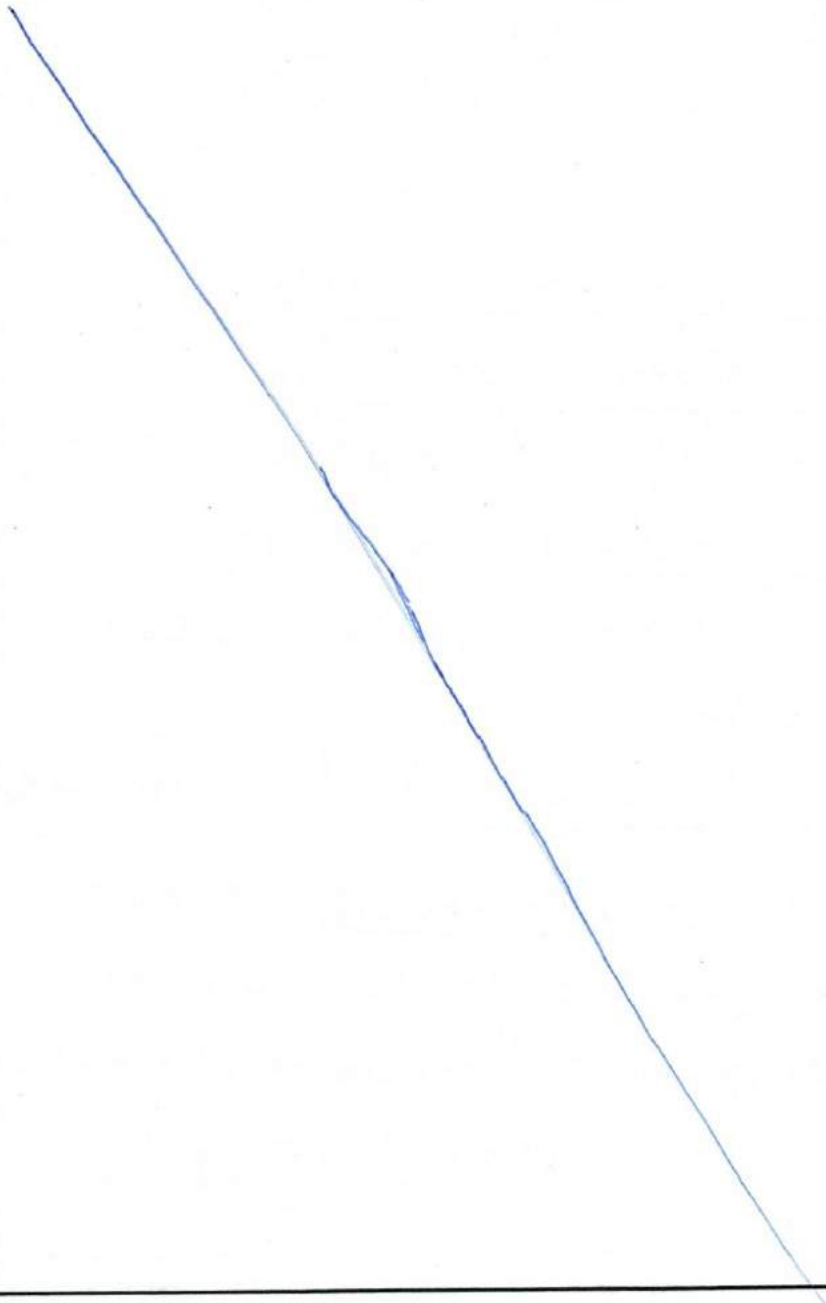
→ High rate of evaporation in this area leaves behind high salinity.

→ Seaweeds add to the salinity.

→ Density differences reflect high salinity in the region.

→ Therefore, ^{since} Sargasso sea falls in one of the busiest shipping

and transport routes, human
activities and pollution also
lead to high salinity.



3. Why are river deltas important? Discuss the existing threats to river deltas and the measures needed to overcome these threats.

नदी डेल्टा क्यों महत्वपूर्ण होते हैं? नदी डेल्टाओं के समक्ष विद्यमान खतरों एवं इन खतरों से निपटने के लिए आवश्यक उपायों पर चर्चा कीजिए।

River deltas are landforms created in the last stage of a river before it falls into the sea. Their importance lies in the following facts :-

- Transport → they provide avenues for effective inland transport.
- Access to water, hence are areas of populous settlements.
- Help as natural harbours and in port formation for shipping.
- Provide ecosystem services as they host one of the largest wetlands in the world.
- Are a source of effective mining

and quarrying activities as they consist of segregated and fine sand and gravel.

Threats to river deltas :-

- Sea rise due to global warming is leading to movement of sea water into delta areas.
- depletion of wetlands and hence, natural buffer zones due to human activities.
- Shipping and inland waterways are polluting the deltas.
- Erosion of soil quality and amount of soil available.
- Mining and quarrying are leading to overexploitation of natural resources.
- creation of dams and reservoirs are reducing the flow of water

and the amount of sand that comes downstream.

→ Riparian rights of downstream states affected.

Measures needed to overcome these threats :-

→ Effectively implement Environment Impact Assessment (EIA), 2016 notification.

→ Strike a balance between development and conservation.

→ Involve CSR funds to develop a culture of sustainable development.

→ Afforestation and Promotion of wetlands.

→ contain anthropogenic activities that cause global warming.

4. Give an account of the different types of earthquakes based on their zone of occurrence. Identify the earthquake prone regions of the world with special reference to India. Also explain the reasons for the occurrence of earthquakes in geologically inactive regions like Peninsular India.

घटित होने वाले क्षेत्र के आधार पर विभिन्न प्रकार के भूकंपों का विवरण प्रदान कीजिए। भारत के विशेष संदर्भ में विश्व के भूकंप प्रवण क्षेत्रों की पहचान कीजिए। साथ ही, प्रायद्वीपीय भारत जैसे भूवैज्ञानिक रूप से निष्क्रिय/स्थिर क्षेत्रों में भूकंपीय घटनाओं के कारणों की भी व्याख्या कीजिए।

Earthquakes are caused due to the stresses caused by seismic waves in the interior of the earth-like primary and secondary waves (Rayleigh and Love), causing squeezing, stretching or pulling materials to reach the epicentre on the earth's surface.

Earthquakes can be deep, intermediate or shallow, depending on the following types:-

- Tectonic Earthquakes - due to sliding of rocks.
- Volcanic Earthquakes - occur in zones of earthquakes due to volcanic eruptions (active)

- collapse earthquakes - when roofs of underground mines collapse
- Explosion earthquakes - due to nuclear or chemical ~~explosions~~ explosions
- Reservoir Induced earthquakes.

Earthquake prone regions :-

→ World :-

- ↳ Found around major (7) and minor Plate boundaries. due to submergence or divergence.
- ↳ Plenty around the Pacific "Ring of fire" in countries surrounding the north Pacific Ocean
- ↳ Rift valleys like East Africa.

→ India :-

- ↳ There are four Earthquake Prone zones (I to IV)
- Zone I → most severe - Jammu & Kashmir, Himachal, Uttarakhand, entire North-East, and Andaman and Nicobar Islands, Gujarat.

Zone IV → lesser / some parts in above states, and Delhi.

Zone III → Maharashtra, Odisha, Chattisgarh, West Bengal, Bihar etc.

Zone II → Rest of India.

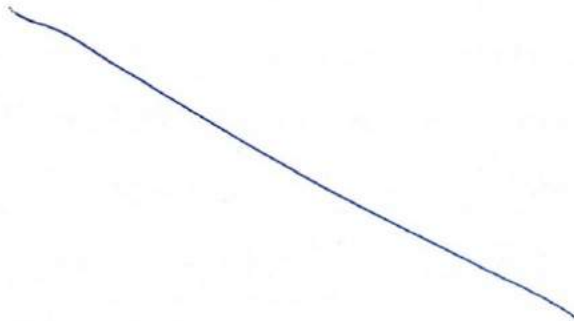
Occurrence in geologically inactive regions:-

→ Breaking away / Rupture in plates.

→ States like Maharashtra have large dams - hence, reservoir induced earthquakes.

→ Presence of Rift valley system

→ Challenge the theory of exclusivity of earthquakes along plate boundaries.



5. Explain the reasons for the following: (a) Erosional forms dominate in the west coast while depositional forms dominate in the east coast of India. (b) Western Ghats in Karnataka receive more monsoon rainfall than Maharashtra and Kerala.

निम्नलिखित के कारणों की व्याख्या कीजिए: (a) भारत के पश्चिमी तट में अपरदनजन्य रूपों की अधिकता या बाहुल्य पाया जाता है, जबकि पूर्वी तट पर निक्षेपण रूपों का बाहुल्य पाया जाता है। (b) कर्नाटक में पश्चिमी घाट महाराष्ट्र और केरल की तुलना में अधिक मानसूनी वर्षा प्राप्त करते हैं।

(a) Erosional forms dominate in the west coast while depositional forms dominate in the east coast due to the following reasons:-

→ West coast is a zone of submergence while east coast is a zone of emergence.

→ Coriolis force deflects rightward in the northern hemisphere. Hence, water and wind as erosional agents act towards the coast in the west, and ^{away from} ~~towards~~ the coast in the east.

→ Tides are higher and stronger on the west coast than east coast - hence the impact of water

as an erosional agent is higher on the west.

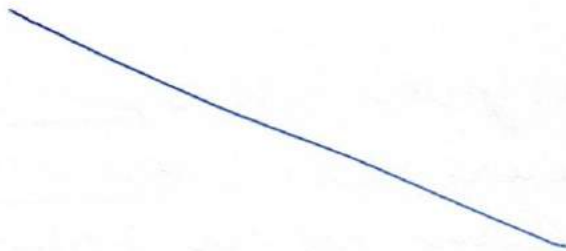
→ The west coast is made up of hard rocks and ancient structures that are most susceptible to erosion. The east coast has more of river deltas and beaches.

→ The south-west monsoon directly hits the west coast, providing more erosional action through wind and water than east coast.

(6) Western Ghats in Karnataka receive more monsoon rainfall than Maharashtra and Kerala because:

→ The Ghats are wider in Karnataka and narrower in Maharashtra and Kerala.

- The gradient of the slopes is more favourable for rain in Karnataka than Kerala and Maharashtra.
- The gorges in Karnataka are more continuous than in Kerala and Maharashtra, hence there is little space for the oil laden winds to pass through, as opposed to the latter.
- As they are windier in Karnataka, winds exhaust all the rainfall by the time they reach the leeward side. This does not happen in the case of Kerala and Maharashtra.



6. With increasing urbanisation in India, the land usage pattern is undergoing major changes. Comment.

भारत में बढ़ते शहरीकरण के साथ ही भू-उपयोग प्रतिरूप में भी महत्वपूर्ण परिवर्तन हो रहे हैं। टिप्पणी कीजिए।

The expansive rural to urban migration is a result of poverty and lack of opportunities in the rural areas, and attractiveness of the urban areas for a better living standard. This rapid urbanisation is inducing the following changes in the land usage patterns :-

Urban areas :-

→ Cities are expanding in all directions in an unplanned manner.

→ This has given rise to peri-urban areas where land is diverted to house blums for the expanding population.

→ To accommodate people and resultant environmental concerns, businesses and industries are moving beyond urban areas where rural land is acquired for them.

→ The shift from residing in houses to housing in flats due to less availability of land and its resultant escalation of prices.

Rural areas:-

→ Agricultural lands are being acquired for residential projects by developers to accommodate growing cities. eg. Greater Noida, Gurgaon etcetera.

→ Now government, in order to stop migration due to urbanisation, has started the Rurban Mission and idea of 'Smart Villages'.

where land is diverted for state development centres and other such institutions.

→ semi-urban areas have come up between rural and urban areas, which house industries like food processing, etc.

→ Acquisition of land in interiors for road transport networks and freight corridors are also linked to urbanisation and trade.

Therefore, land usage pattern is changing rapidly. A balance needs to be maintained between development and conservation, and prevent overexploitation of land by adopting sustainable means.

7. How is the coal bearing strata of India classified in geological terms? Why does coal remain the most important source of energy in India and what are its implications?

भूवैज्ञानिक शब्दावली में भारत के कोयला धारण करने वाले संस्तर को किस प्रकार वर्गीकृत किया जाता है? कोयला भारत में ऊर्जा का सबसे महत्वपूर्ण स्रोत क्यों बना हुआ है एवं इसके निहितार्थ क्या हैं?

Coal is found in abundance in India. Geologically, all forms of coal i.e. Anthracite, Bituminous, Lignite and Peat are found in Gondwana lands and tertiary coal deposits. Anthracite, the purest form, is mostly only found in Jammu and Kashmir.

The coal found in Gondwana land is mostly centred around Odisha, Chhattisgarh, West Bengal, etc. Tertiary deposits are found in North-east, like Assam and Nagaland.

Coal is the most important source of energy in India because :-

- Found in abundance.
- Technology to reap benefits already in place as 65% of energy needs already met through coal.
- Alternative sources like renewable energy not fully developed yet.
- Limited potential and reaping of hydro energy (24%)
- Manpower and labour already skilled and trained in this regard.
- Infrastructure for this was invested in and continues to be utilized.
- Provides economies of scale.

However, such heavy reliance on coal also has the

following implications:-

→ Negative externalities in terms of environment, as coal is a polluting substance.

→ Coal in India is low grade. Hence, heavy reliance on imports, and substant effect on current Account deficit.

→ Occupational hazards for employees working in coal mines eg. health impact and chronic diseases.

→ Overstepping the carbon budget as increased carbon footprint compromises on sustainable development.

→ contributes to greenhouse gas emissions, and hence to global warming and climate change.

8. Forest fires have become a regular feature during summers in the Western Himalayas. What are the causes behind this phenomenon? Critically examine the efforts made by authorities in countering this problem. Do periodic forest fires have any benefits associated with them?

पश्चिमी हिमालय में ग्रीष्म ऋतु के दौरान दावानल/वनाग्नि (फॉरेस्ट फायर) एक नियमित घटना बन गयी है। इस परिघटना के पीछे क्या कारण हैं? इस समस्या से निबटने के लिए प्राधिकरणों द्वारा किए गए प्रयासों का आलोचनात्मक परीक्षण कीजिए। क्या समय-समय पर होने वाली दानाबल की घटनाओं के कुछ लाभ भी हैं?

Forest fires are a form of disaster, whose source lies in both natural and anthropogenic causes. The State of Forest Report, 2015 highlights the extent to which these have spread, the maximum being in North-east, Chattisgarh, MP and Maharashtra. Recently, these spread over vast areas in Uttarabhand and Himachal Pradesh. The causes are:-

→ Natural causes:-

↳ Large presence of Pine needles, which easily catch fire and spread both surface and churn fire.

↳ Global warming which is making twigs and wood more susceptible to even small sparks of fire.

→ Anthropogenic causes:-

↳ Stable and Burnⁿ Agriculture/
Thinning cultivation is at
times responsible.

↳ Failure to contain disasters,
and bureaucratic failures, with
heavy reliance on army.

Efforts made by authorities:-

→ set up National Disaster Response Force (NDRF) as a special unit to fight such disasters. However, NDRF has turned out to be largely toothless, functioning in an isolated manner, and ineffective.

→ State Reporting Systems have

failed and no early warning system in place.

→ Efforts to involve community participation and reporting have also failed.

→ As a last resort, over reliance on army. Eg. in Uttarakhand, army doused fires by air dropping huge amount of water.

Benefits of Forest Fires:-

→ They remove the unwanted and damning pests from the soil.

→ Periodic fires help (in a controlled manner) enrich nutrients in soil.

→ Ash mixed with soil helps in mulching and adds value.

→ Reverses soil's lost characteristics due to previous over exploitation.

→ clears land and provides space.

9. What are sunrise industries? Elaborate on the potential of these industries in India with a special focus on the food processing industry.

सनराइज उद्योग क्या है? खाद्य प्रसंस्करण उद्योग पर विशेष बल देते हुए भारत में इन उद्योगों की संभावना के संबंध में विस्तार से बताइए।

Sunrise industries are those that are upcoming modern industries, looked upon as future models for propelling economic growth. They leverage on their capability of applying minimum inputs efficiently, and reaping maximum outputs. The potential of these industries is huge :-

- Can tap into the 4th Industrial Revolution to use technology for further advancement.
- With the help of government schemes, can get access to skilled labour.

→ Easing of FDI has expanded financial sources of investment, which is favourable for the economy as well.

Food Processing Industry

It is a sunrise industry that provides a critical link between agriculture and manufacturing.

Its contributions towards of the macro-economy are :-

- Contributes a large share of GDP.
- Provides localised employment.
- Increases exports, hence revenue.
- Increases the supply of nutrition through food fortification.
- Increases longevity of agricultural produce.
- Provides infrastructure for business acceleration.

The government has undertaken various initiatives to promote this industry. These are:-

- SAMPADA scheme - improved version of the Mega Food Parks scheme - which uses a Hub and spoke model to integrate primary, collection and final ~~collection~~ processing centres.
- National Mission for Food Processing, which also now feeds into the SAMPADA scheme.

Hence, the food processing industry, along with other sunrise industries like Tourism provide a huge impetus to economic growth.

10. Scientific and technological advancements have removed the constraints posed by geographical factors which determine the location of industries. Comment. Giving examples, discuss the new factors that have come into play as a result.

वैज्ञानिक और प्रौद्योगिकीय प्रगति ने उद्योगों की अवस्थिति को निर्धारित करने वाले भौगोलिक कारकों द्वारा प्रस्तुत की जाने वाली बाधाओं को समाप्त कर दिया है। टिप्पणी कीजिए। इनके परिणाम स्वरूप उभरने वाले नए कारकों पर भी सोदाहरण चर्चा कीजिए।

Location of industries was initially dependent on several geographical factors such as location near raw materials, access to markets, local availability of labour, continued power sources, transport availability, penetration into interiors, travel time (in case of weight losing materials), climate, etc.

However, science and technological advancements have reduced these constraints as:-
→ Primary processing has ensured that the life of raw materials

- is not reduced due to travel time,
- Mobility of labour due to better transport network and advancements such as Metro have helped a great deal.
 - Access to markets has now moved online - eg. Flipkart and Snapdeal have increased the reach of products.
 - Platforms (online) for employment, demand and supply of raw materials have removed accessibility constraints.
 - Apps like the gaw App have provided transparency in provision of electricity. So, differential treatment has been done away.
- Therefore, many new factors

- have come into play. These are :-
- Access to internet - both hardware and software.
 - mobile connectivity - to reap the benefits of science and technology.
 - Online Banking - to reduce reliance on brick and mortar banks, for both - industry and labour.
 - Social Media Reach - to attract young talent, build credibility and goodwill, etc.

11. Give a brief distribution of major grasslands of the world. Discuss the reasons behind the temperate grasslands becoming the grain baskets of the world. Also compare their performance vis-a-vis tropical grasslands in this regard.

विश्व के प्रमुख घासस्थलों के वितरण का एक संक्षिप्त विवरण प्रस्तुत कीजिए। शीतोष्ण घासस्थलों के विश्व की खाद्यान्न टोकरी बनने के निहित कारणों की चर्चा कीजिए। इस संबंध में उष्णकटिबंधीय घासस्थलों की तुलना में उनके प्रदर्शन की चर्चा भी कीजिए।

Grasslands are vast expanses of natural vegetation, spread over a large area, which play a significant role in the economy and biodiversity. The two types of grasslands and their differing features are :-

Tropical grasslands	Temperate grasslands.
→ Names → <u>Savanna</u> (Africa); <u>Campes & Campos</u> (South America)	→ <u>Steppes</u> (Central Asia); <u>Prairies</u> (N. America); <u>Pampas</u> (S. America); <u>Downs</u> (Australia); <u>Velots</u> (S. Africa); <u>Pustoz</u> (Hungary)
→ Between <u>0° to 20°</u> on both sides of the equator	→ Between <u>30° - 45°</u> North and South.
→ <u>Tall grasses</u> interspersed with trees & shrubs.	→ <u>Short grasses</u> over vast land area (plain)

Temperate grasslands are called the 'granaries' of the world due to:-

→ Favourable climate - less daily and annual range of temperature. The slight cold favours effective germination of seeds.

→ Vast tracts of land favour large scale mechanisation and economies of scale.

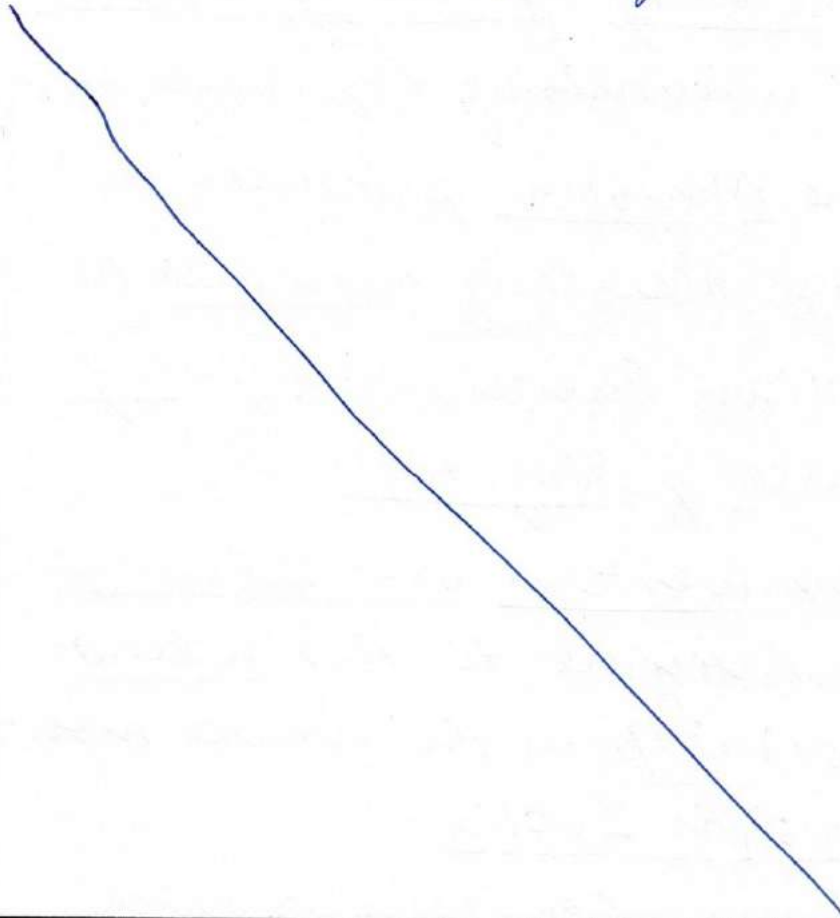
→ Topography is mostly flat and soil is rich with availability of water.

→ Also favours animal rearing and mixed farming to provide complimentarity.

→ Rich soil and nitrogen fixation have increased yield per hectare.

On the other hand, tropical grasslands are smaller

in size, are rocky with trees
and shrubs, and climate near
the equator is not very favourable
for large scale agricultural
activities. Hence, temperate
grasslands have performed much
better than tropical grasslands.



12. Weather and climate information plays a significant role in increasing agricultural productivity as well as minimising crop losses. Comment. Also examine the ways in which forecasting system can be made more effective and inclusive.

मौसम और जलवायु संबंधी सूचना कृषि उत्पादकता को बढ़ाने एवं साथ ही साथ फसल के नुकसान को कम करने में महत्वपूर्ण भूमिका निभाती है। टिप्पणी कीजिए। इसके साथ ही उन उपायों का परीक्षण कीजिए जिससे पूर्वानुमान प्रणाली को और अधिक प्रभावी एवं समावेशी बनाया जा सकता है।

Weather and climate have a wide scale impact on our lives. One such area is in increasing agricultural productivity and minimising crop losses, as:-

- The monsoon provides a huge source of rain fall to Indian lands, a primary source of irrigation.
- The western disturbances are integral to the wheat (Rabi) crop in the winter months in northern India.
- favourable climate and

Resultant soils provide an impetus to high growth of tea in Darjeeling-Siliguri regions.

→ weather and climate are passive soil forming factors. Different weather areas have different soils, favourable for different kinds of crops.
eg. Alluvial for rice and wheat, Black/Regur for cotton, Laterite for Cashews, etc.

→ Patterns are known beforehand. Hence, agricultural activity can be planned accordingly.

The Indian Meteorological Department (IMD) provides for

weather forecasting. It can be made more effective in the following ways :-

- Shifting from current Statistical model to an advanced proposed model of real time analysis
- Supplement with SMS alerts, and information generation systems.
- collaborate with international agencies to improve accuracy.
- Invest in R&D to upgrade systems.
- Leverage on ISRO's prowess and utilize platforms like Bluescan, etc.

13. The Paris Climate agreement sets ambitious goals but does not go far enough in mechanisms to achieve the aims. Comment. Also highlight the challenges which a developing country like India faces to achieve the targets it has set for itself.

पेरिस जलवायु समझौता महत्वाकांक्षी लक्ष्यों को तो निर्धारित करता है किन्तु इन लक्ष्यों को प्राप्त करने के लिए पर्याप्त प्रावधानों की व्यवस्था नहीं करता है। टिप्पणी कीजिए। साथ ही, भारत जैसे विकासशील देश द्वारा अपने लिए निर्धारित किए गए लक्ष्यों को प्राप्त करने में सामना की जाने वाली चुनौतियों पर भी प्रकाश डालिए।

The Paris Climate Agreement [COP-21] of the UNFCCC seeks to reduce greenhouse gas emissions and the resultant rise in temperature to less than 2°C (even try for 1.5°C) below pre-industrial levels. It requires countries to submit their Intended Nationally Determined Contributions (INDCs) and a review every 5 years.

While these targets are ambitious, the mechanisms to achieve these goals are lacking, as :-
→ The Green Climate Fund (GCF),

to which \$100 billion a year was pledged by developed countries has not seen much progress.

Even now, there is no accountability mechanism.

→ Only the 2°C limit is binding, whereas NDc's are voluntary. Hence, no repercussions for failure to comply.

→ The principle of CBDR-RC does not find any valuable implementation.

→ Transfer of funds and technology to developing countries have not been provided for (mechanism).

→ no roadmap for carbon trading.

India has set the following targets (INDC) :-

→ Emissions reduction by 33-35% by 2030, of 2005 levels.

→ 40% of energy to be from non-fossil fuel-based sources.

→ To create 2.5 - 3 Billion CO₂ unit worth
equivalent carbon sinks.

Challenges before India's targets :-

- Technology transfer a must,
from developed countries.
- While good progress is made in
Solar energy, high costs and
lack of training of personnel are
drawbacks.
- Reliance on GCF for additional
funds.
- Seamless grid connectivity for
alternative sources of energy,
into the main grid.
- Rooftop solar has been very
slowly embraced with only
1 GW out of target of 40 GW
met as of now.

14. Describe the factors responsible for increase in marine pollution in the past few decades. What impact does marine pollution have on the ocean ecosystem? Discuss the measures taken by the international community to deal with it.

पिछले कुछ दशकों में समुद्री प्रदूषण में हुई वृद्धि के लिए जिम्मेदार कारकों का वर्णन कीजिए। महासागरीय पारिस्थितिकी तंत्र पर समुद्री प्रदूषण का क्या प्रभाव पड़ता है? इससे निपटने के लिए अंतरराष्ट्रीय समुदाय द्वारा किए गए उपायों की चर्चा कीजिए।

Marine pollution is an environmental hazard that has far reaching consequences on the lives of humans and animals alike. The causes / factors are :-

- widescale shipping activity - causes noise and physical pollution in seas/oceans.
- Oil spills due to accidents / human negligence.
- Ineffective waste management.
- Discharge of industrial effluents into the sea.
- Discharge of plastic wastes and microbeads, that enters

The aquatic ecosystem.

Impact on the ocean system:-

- Coral bleaching
- deafening of marine animals
due to noises of ships, etc.
- Extinction of species.
- causes behavioural changes
in marine animals.
- Plastics enter the food chain
and have health consequences
for us and animals.

Measures taken by International Community:-

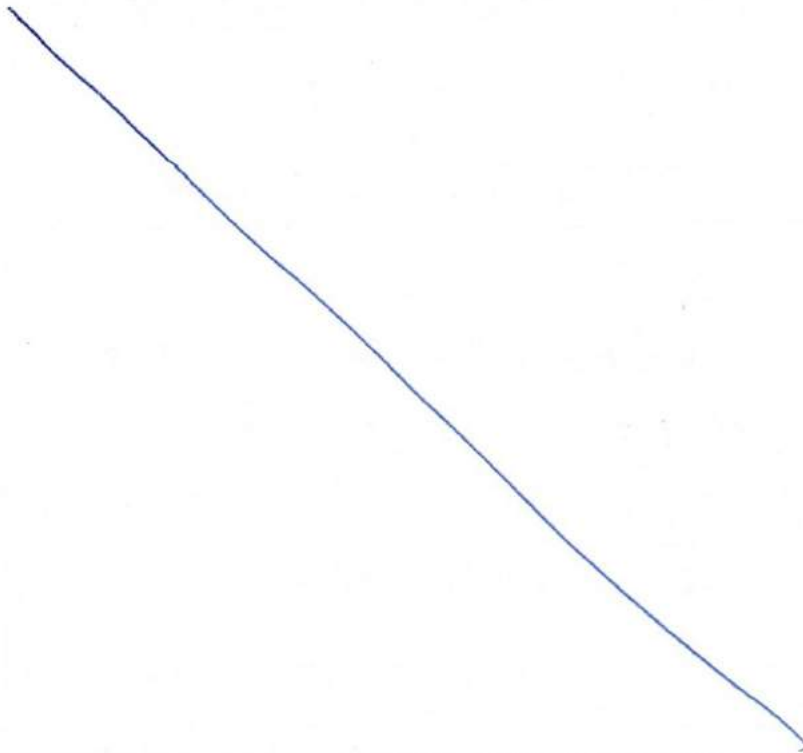
- UN convention on law of the sea (UNCLOS) - Chapter XIII,
Articles 194-196 deal with punishment
for marine pollution.
- IMO's convention on marine

Pollution, 1960

→ MARPOL convention, 1973 deals with consequences or consequences of violations.

→ convention on Ballast water management.

→ Polluter Pays Principle is now a part of customary International law.



15. Discuss the environmental impact of electronic waste and the best practices for its handling in the context of the E-waste (Management) Rules, 2016. Also suggest some ways to incentivise consumers to utilise and dispose-off the e-waste properly.

इलेक्ट्रॉनिक अपशिष्ट के पर्यावरणीय प्रभावों एवं ई-अपशिष्ट (प्रबंधन) नियम, 2016 के संदर्भ में इसके निष्पादन के लिए सर्वोत्तम तरीकों पर चर्चा कीजिए। ई-अपशिष्ट के उचित उपयोग और निपटान के लिए उपभोक्ताओं को प्रोत्साहन प्रदान करने हेतु कुछ उपाय भी सुझाइए।

The advancements in science and technology have multiplied the problem of E-waste, which constitutes discarded, obsolete and now wasteful electronic equipment. These have many harmful metals like lead, Cadmium, Nickel, Mica, etc which need to be effectively discarded to prevent adverse effects to humans.

The government has introduced the E-waste (management) Rules, 2016, which have attempted to incorporate the following

Best practices:-

- Extended Producer's Responsibility (EPR) - whereby Producers have been made equally responsible as consumers, towards handling e-waste.
- Consumer awareness to not discard electric equipments that are of no use.
- Advance contracts with consumers - to get refunded money upon return of used products after 2-3 years.
- Exchange contracts - providing a value to old equipment while purchasing a new one.
- Focus on Reduce, Reuse and Recycle (3R's).

Ways to incentivise consumers for effective disposal :-

- Run consumer awareness programs like "Jago Gharale Jago".
- Get celebrity figures to speak on and promote the need for effective disposal.
- Incentivise further by giving a good price in exchange contracts.
- Introduce chapters on waste disposal in school curriculum.
- Make E-waste disposal a movement and integrate with Swachh Bharat Mission.
- Introduce ranking of states on waste disposal performance, with E-waste being a criteria.

16. An emissions-reduction approach to fighting global warming is not enough. Alternative solutions involving climate engineering might have to be deployed sooner than we think. Defining climate engineering, critically examine the statement.

ग्लोबल वार्मिंग से निपटने के लिए केवल उत्सर्जन-न्यूनीकरण उपागम (दृष्टिकोण) पर्याप्त नहीं है। संभवतः हमें अनुमानित समय से पूर्व ही, क्लाइमेट इंजीनियरिंग को सम्मिलित करने वाले वैकल्पिक समाधान को अपनाने की आवश्यकता पड़ सकती है। क्लाइमेट इंजीनियरिंग को परिभाषित करते हुए, इस कथन का आलोचनात्मक परीक्षण कीजिए।

The Paris Agreement and its preceding Kyoto Protocol have litherto only focussed on emissions reductions as the primary objective of fighting global warming. However, these being long term and not always effective, need to be supplemented by alternative solutions like climate engineering. These are :-

→ Carbon capture and storage (CCS) → it involves capturing carbon through technology and storing it underground.

eg. here CARBFIX project as
an effective tool of carbon
sequestration.

- Artificial Injection of Aerosols
in stratosphere - these will
reflect some ^{sun} rays before entering
Earth's atmosphere and can
cool down atmosphere by 1°C.
- Placing reflecting mirrors
in stratosphere, these will
also have this desired effect.
- cloud seeding by injecting
Silver Iodide in the atmosphere,
which will cause rain and
have a cooling effect on
the atmosphere.

Therefore, climate engineering involves using science to alter the natural process of climate to have desired effect of lower global warming. HOWEVER, the potential of these is limited, as :-

- None of the above experiments are successful.
- cloud seeding has repeatedly failed.
- Ethical issues with interfering with nature.
- Huge costs involved.
- stratosphere has not yet been fully understood to carry out such interventions.
- Artificial cooling may have negative externalities.

17. Discuss how drought is more of a man-made disaster than a mere deficiency of rainfall. Elaborate on the consequences of desertification that drought prone regions face. Also, bring out the preventive steps to be taken in light of targets to curb desertification as mentioned under the SDGs.

चर्चा कीजिए कि किस प्रकार सूखा केवल वर्षा की कमी से पैदा आपदा न हो कर मुख्य रूप से एक मानव-निर्मित आपदा है। सूखा प्रवण क्षेत्रों द्वारा सामना किए जाने वाले मरुस्थलीकरण के परिणामों को विस्तार से बताइए। साथ ही, मरुस्थलीकरण पर अंकुश लगाने के लिए SDGs के अंतर्गत उल्लिखित लक्ष्यों के प्रकाश में उठाए जाने वाले निवारक कदमों को स्पष्ट कीजिए।

Droughts have their origin in deficiency of rainfall. HOWEVER, their effects are accentuated due to human mismanagement.

Examples are :-

- sourcing of water guzzling crops like sugarcane in drought prone areas like malharashtra.
- Lack of planning in advance when drought prone ness is already known.
- unequal utilization of river waters.
- delayed clearances/implementation

of river linking projects.

↳ deforestation

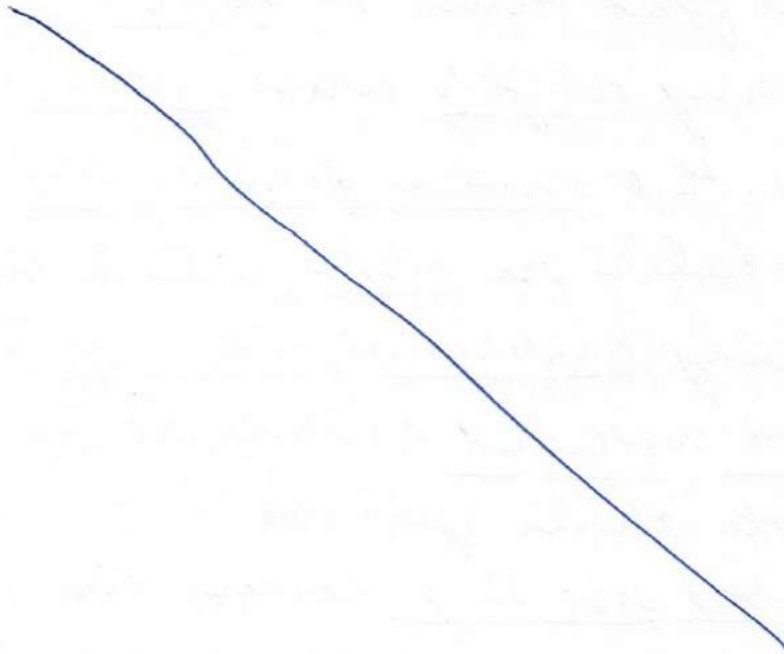
Such areas face desertification due to low water availability and degraded soil quality.

Its consequences are :-

- Unfit for any cultivation except desert shrubs.
- Worsens conditions of farmers, leading to farmer suicides.
- Leads to anti-social elements like Naxalism or dacoits of charcoal ravines.
- Affects access to food and minimum life requirements of people in those areas - malnutrition etc.
- furthers poverty.

The Preventive steps that can be taken in light of SDG's are :-

- Put early warning systems in place.
- River-linking projects.
- Rationalise cropping patterns.
- Equalize MSP for most crops to encourage equal and merit-based sowing.
- Controlled and limited farm loan waivers in case of declared droughts.



18. India's first National Disaster Management Plan may fulfill the legal requirement of having a plan but it may not be very effective in achieving its objective of building resilience. Critically analyse.

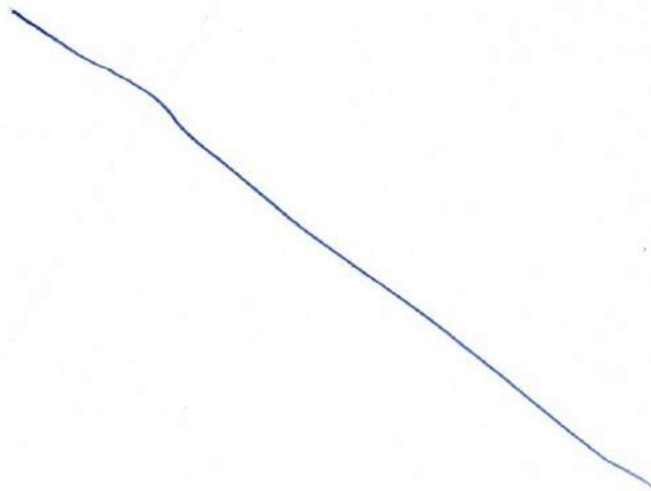
भारत की प्रथम राष्ट्रीय आपदा प्रबंधन योजना, भले ही एक योजना होने की विधिक आवश्यकता को पूर्ण कर सकती है किन्तु यह प्रत्यास्थता निर्माण करने के अपने उद्देश्य को प्राप्त करने में अधिक प्रभावी नहीं हो सकती। आलोचनात्मक विश्लेषण कीजिए।

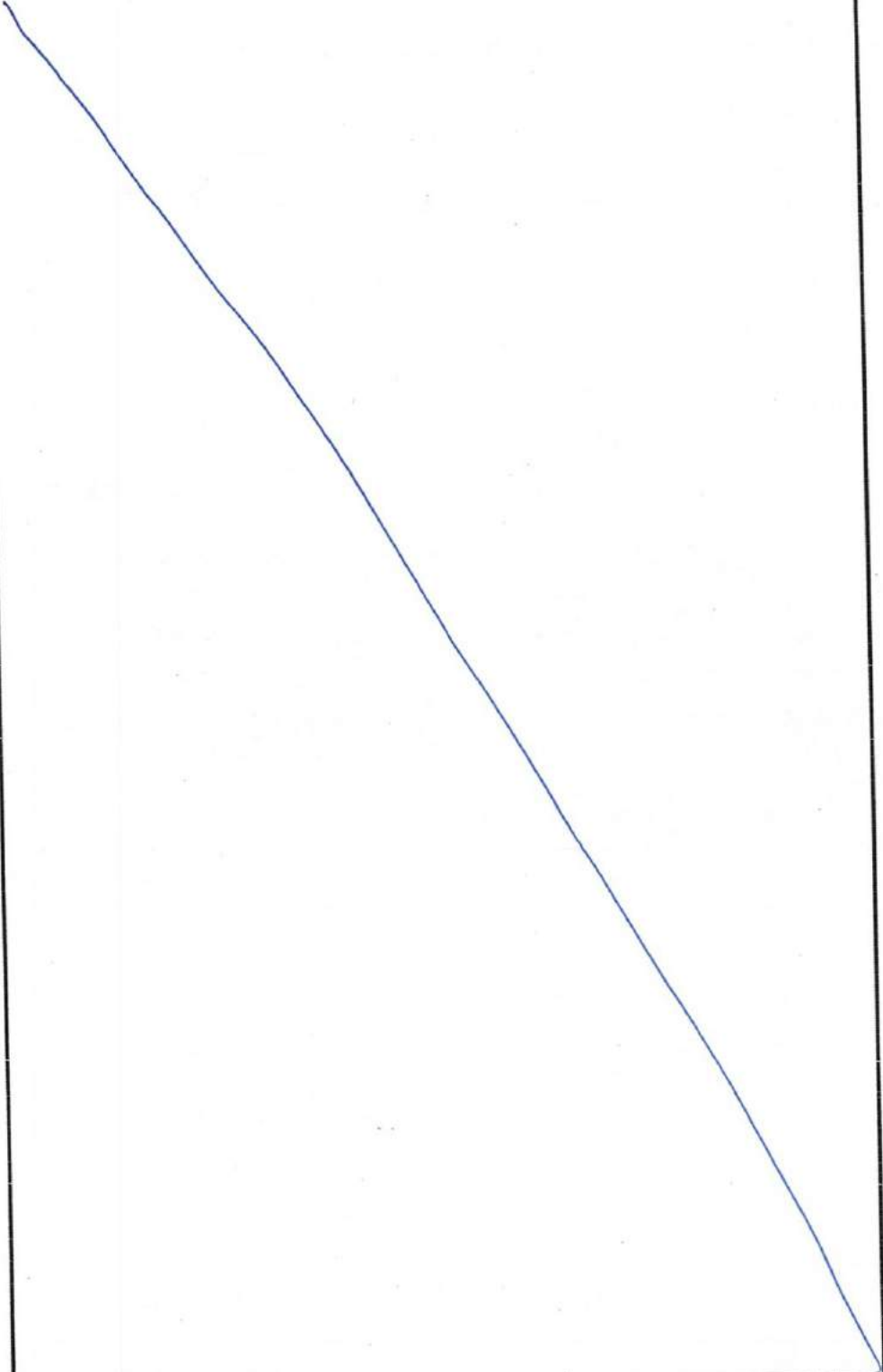
The National Disaster Management Plan, 2016 (NDMP) was India's 1st concerted plan in that regard. It focussed on the Sendai principles. HOWEVER, it may not be very effective due to :-

- The fact that it does not set any targets or goals like the Sendai framework
- It relies on NDRF, which is largely ineffective, working in silos, without coordination with other agencies.
- Does not lay down the mechanism of reducing risk,

- improving risk governance, etc.
- does not address gender-based concerns like Ind ARC did.
 - source of funds not clear.
 - community participation not effectively enhanced.

Hence, the NDMP, while a welcome step, needs to incorporate an integrated approach of all sectors and stakeholders.





19. A better prepared community is key to effective disaster risk reduction. Citing specific examples, examine the importance of the role of local government and community in dealing with disasters.

प्रभावी आपदा जोखिम न्यूनीकरण के लिए एक बेहतर रूप से तैयार समुदाय महत्वपूर्ण है। विशिष्ट उदाहरण देते हुए आपदाओं से निपटने में स्थानीय सरकार एवं समुदाय की भूमिका के महत्व का परीक्षण कीजिए।

Community participation is the key to addressing disaster situations on the ground.

In doing so, local government bodies like Panchayats and municipal corporations play an integral role, as:-

→ They are closest in terms of governance on the ground.

→ They have decision making powers in times of disasters. Eg. in case of Uttarakhand floods, the DC's and ADC's

were most effective in evacuation, relief and rehabilitation.

→ The DC of one district in Odisha during Phailin, the yclone, was credited for early evacuation and no loss of life.

The community :-

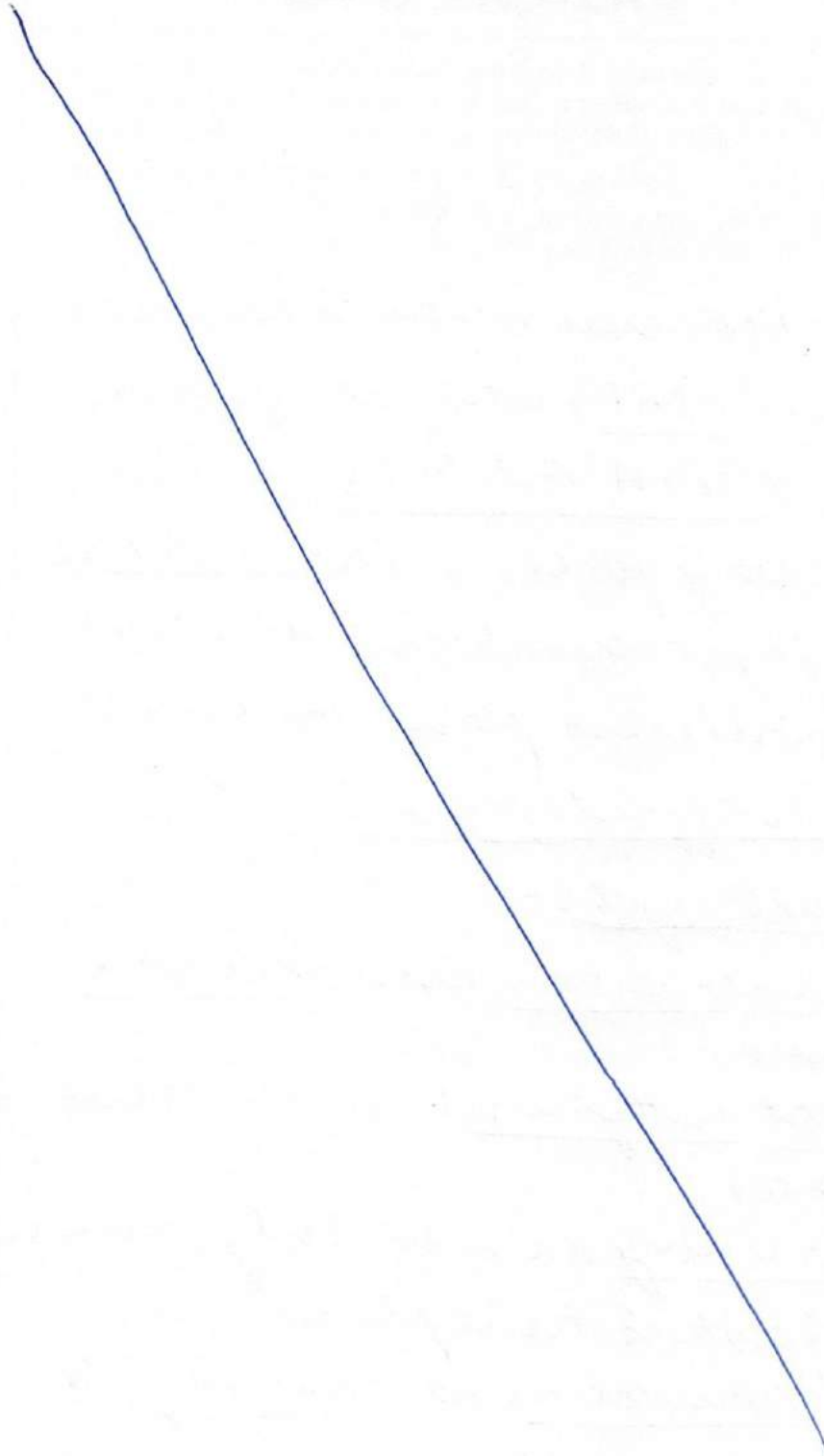
→ Provides moral and emotional support among each other.

→ Work in unison against a natural or man made external force.

→ The strong can help out the not so strong in evacuation operations.

→ Help in providing food and relief materials and their distribution.

→ unity in redevelopment / rebuilding post disaster.



20. What is the role of NDRF in managing disasters in the country? Highlighting the challenges that NDRF has been facing, discuss why it is still the armed forces which end up being the most visible force at hand during disasters.

देश में आपदाओं के प्रबंधन में NDRF की क्या भूमिका है? NDRF द्वारा सामना की जाती रही चुनौतियों पर प्रकाश डालते हुए चर्चा कीजिए कि आपदाओं के दौरान केवल सशस्त्र बल ही क्यों अभी भी सहज और सर्वाधिक उपलब्ध बल के रूप में दृष्टिगोचर होते हैं।

National Disaster Response Force (NDRF) was set up under the NDMA Act, 2005 as the primary force, with 12 battalions, to fight disasters. However, experiences point towards its ineffectiveness.

Challenges:-

→ Centralised and isolated force.

→ Not integrated with other forces.

Effective → Training can be only when disasters take place.

→ Normal time training is inadequate.

- It is a very new force. Hence, capacity addition still taking place.
- sources of fund are largely inadequate.
- Joint Trainings with other countries don't include NDRF.
- Number of personnel very low compared to requirement of the country.

Due to the above reasons, we still rely more on the armed forces as a measure of last resort. NDRF should at least be made to work with the forces to gain more expertise and experience for future.

