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GENERAL STUDIES (TEST CODE : 616)

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Center	DISTANCE LEARNING (CHENNAI)	Date	31/01/2015

INDEX TABLE

Q. No.	Maximum Marks	Marks Obtained
1	12.5	
2	12.5	
3	12.5	
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5	12.5	
6	12.5	
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17	12.5	
18	12.5	
19	12.5	
20	12.5	

Total Marks Obtained:

Remarks:

Signature of Examiner

INSTRUCTIONS

1. Do furnish the appropriate details in the answer sheet (viz. Name, Registration Number and Test Code).
2. There are TWENTY questions printed in ENGLISH.
3. All questions are compulsory.
4. The number of marks carried by a question/part is indicated against it.
5. Answers must be written in the medium authorized in the Admission Certificate, which must be stated clearly on the cover of this Question-Cum-Answer (QCA) Booklet in the space provided. No marks will be given for answers written in medium other than the authorized one.
6. Word limit in questions, if specified, should be adhered to.
7. Any page or portion of the page left blank in the Question-Cum-Answer Booklet must be clearly struck off.

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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

All the questions are compulsory and carry 12.5 marks each. NOT MORE THAN 200 WORDS.

1. Even though the equatorial regions have great potential in timber resources, the lumbering industry has not developed properly in these regions. What could be the possible reasons behind this? Discuss the suitability of the equatorial regions for plantation agriculture.

The equatorial regions have high temperature and abundant rainfall (150-250 cm/annum) that supports luxuriant growth of timber. However, the industry has developed more in temperates than the tropics.

Why the industry failed?

- ✓ The trees of equatorial regions are not found in pure stands; rather, they are scattered in nature. This heterogenous supply of timber has made cost of commercial exploitation very high.
- ✓ The tropical hardwoods do not float readily on water and this makes haulage expensive. Inability to construct proper land transport due to dense vegetation only augments the problem.
- ✓ Most equatorial countries have sparse settlements and their economies are not industrialized. Lack of capital and human labour has also hurt the industry.

✓ The slash and burn agriculture followed in these parts has also left the jungles permanently destroyed.

Potential for plantations:-

✓ A plantation is large piece of land where one crop is intentionally grown for commercial uses: eg: banana, coffee.

Let us take the cocoa plantation in Ghana - an equatorial region.



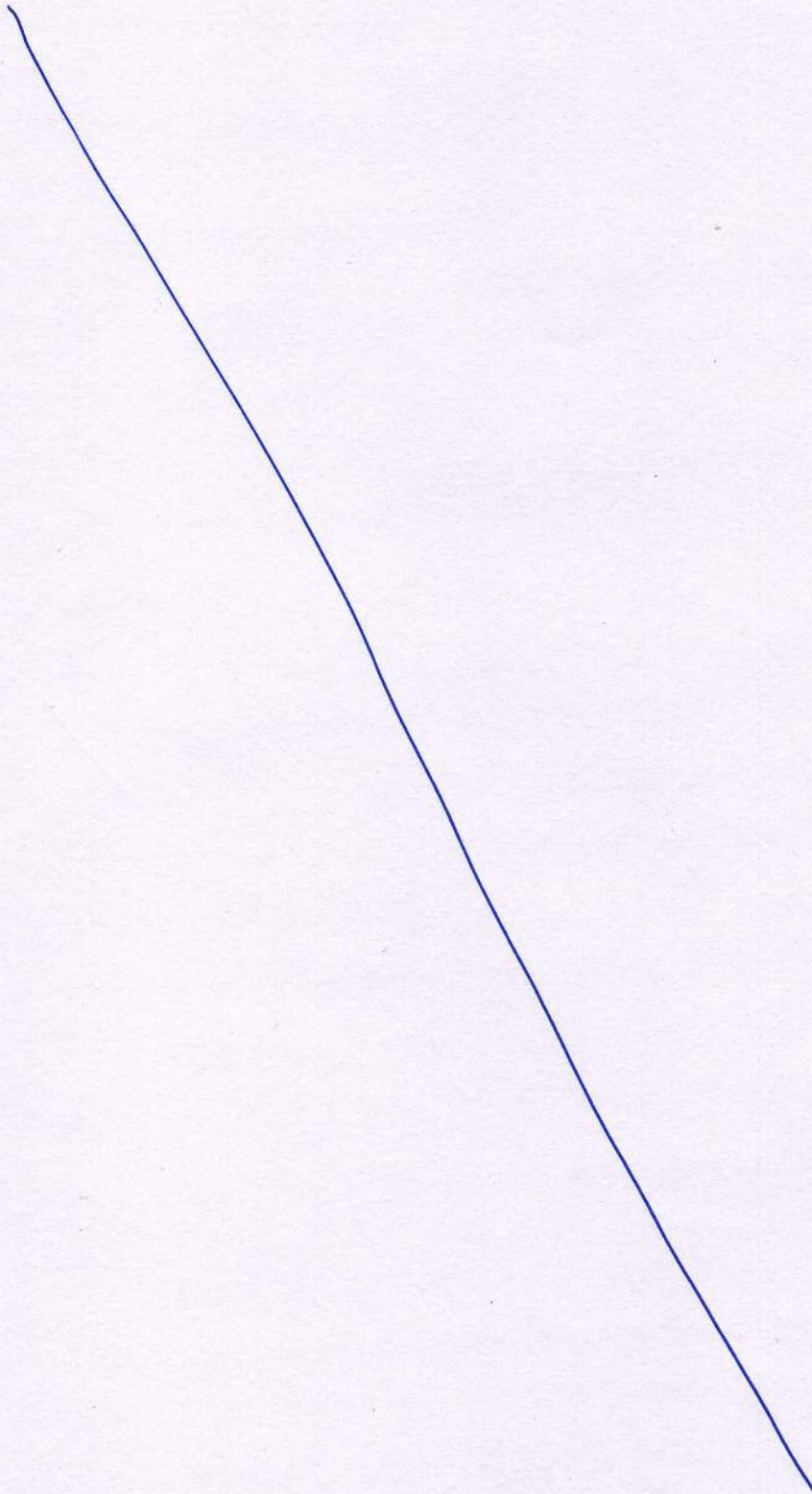
✓ There is warm and wet climate that supports the growth of cocoa.

✓ lot of cheap labourers will be easily available in these regions (tumbadors). The Takoradi port is used to export to the western countries.

✓ Recent chinese and Indian investment in these regions will only help in growth of industry.

✓ Similarly, rubber and banana plantations are found widely in equatorial regions.

✓ With suitable market and infrastructure facilities, the industry has great potential to grow in equatorial regions.



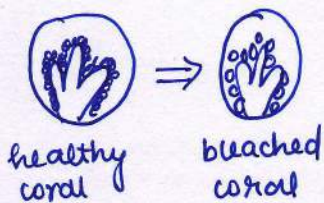
2. Lakshadweep has been facing a drastic decline in coral cover in recent years. Discuss various environmental and anthropogenic factors behind this phenomenon. How can El Nino be disastrous for the world's coral reefs? Illustrate.

✓ The Aminidivi, Laccadive and Minicoy islands form the coral islands in Arabian sea. These islands have been built by corals and have fringing coral reefs close to their shores. It is reported that Lakshadweep has lost 80% of its coral cover.

Environmental factors:-

✓ Temperature - coral species live in a narrow temperature margin (20° - 21° C). Due to elevated sea temperatures (or) sudden drop due to upwelling, corals die unable to handle the stress.

✓ Solar irradiance during summer months causes bleaching in shallow-living corals.



✓ During storm generated precipitation, fresh water dilution has resulted in coral bleaching.

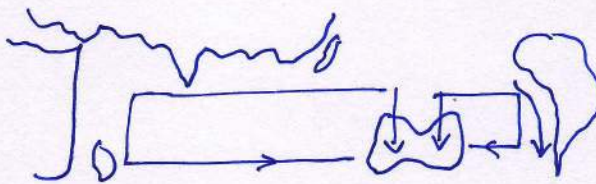
✓ Some pathogens have been responsible to induce coral diseases such as black band disease, coral plague etc.

Anthropogenic factors :-

- ✓ There is swelling population in Lakshwadeep islands. population density is increasing and they are showing signs of urbanisation. This is pushing settlements shoreward causing a stress.
- ✓ The limited ground water resources are exploited by the growing population. Salinity Intrusion caused by rising sea level could aggravate the situation.
- ✓ Lakshwadeep is located along main oil route between Middle East and SE Asia and oil spillage could also pose a threat.
- ✓ Overfishing on reefs leads to imbalance in the ecosystem allowing pathogens to become more dominant.

Role of El Nino :-

- ✓ El Nino is a global climatic phenomenon in which a warm current replaces Humboldt current off the peruvian coast, and this reverse walker circulation.

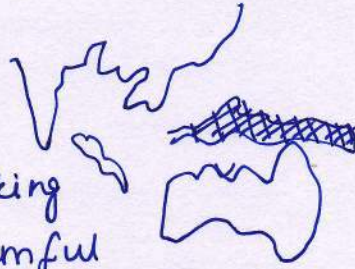


A band of warm water develops in western pacific, while the Indo - pacific warm pool starts oscillating rapidly. This poses a major threat for coral triangle,

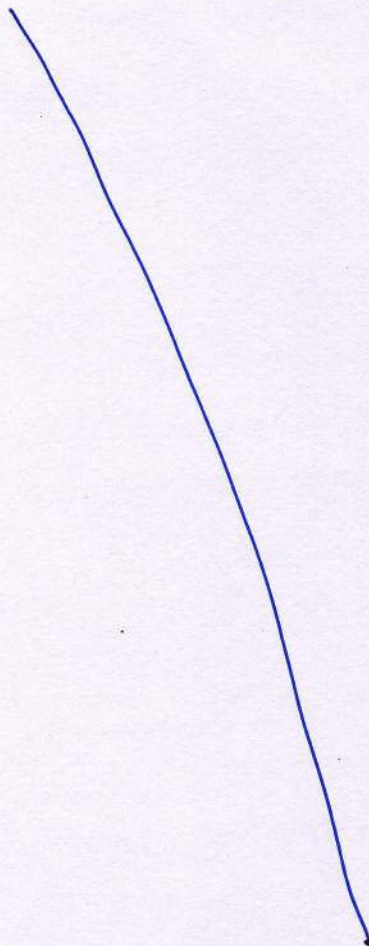
a bio-region in south-east asia. Even the last big El Nino in 1998 caused major loss.

When temperatures rise,

dinoflagellates stop making sugar and produce harmful radicals and their symbiotic relation ends.



The rise in temperatures due to global warming poses huge threat. We need to curb our emissions and create biosphere reserves for coral reefs to protect the rainforests of the ocean.



3. Transport linkages and government policies are the two most important factors influencing the establishment of Footloose industries. What are the other factors which influence the location of these industries? Discuss in the context of India.

✓ Some industries, like watch and electronics, use a wide range of light raw materials and the attractive influence of each separate material diminishes. These industries, called as footloose industries are located without reference to raw materials as a wide range of locations is possible.

Factors influencing location :-

✓ Since they are high technology industries (or) sun rise industries, they require skilled labour. Due to need for research and innovation ideas, they are located nearby premier education and research institutes.

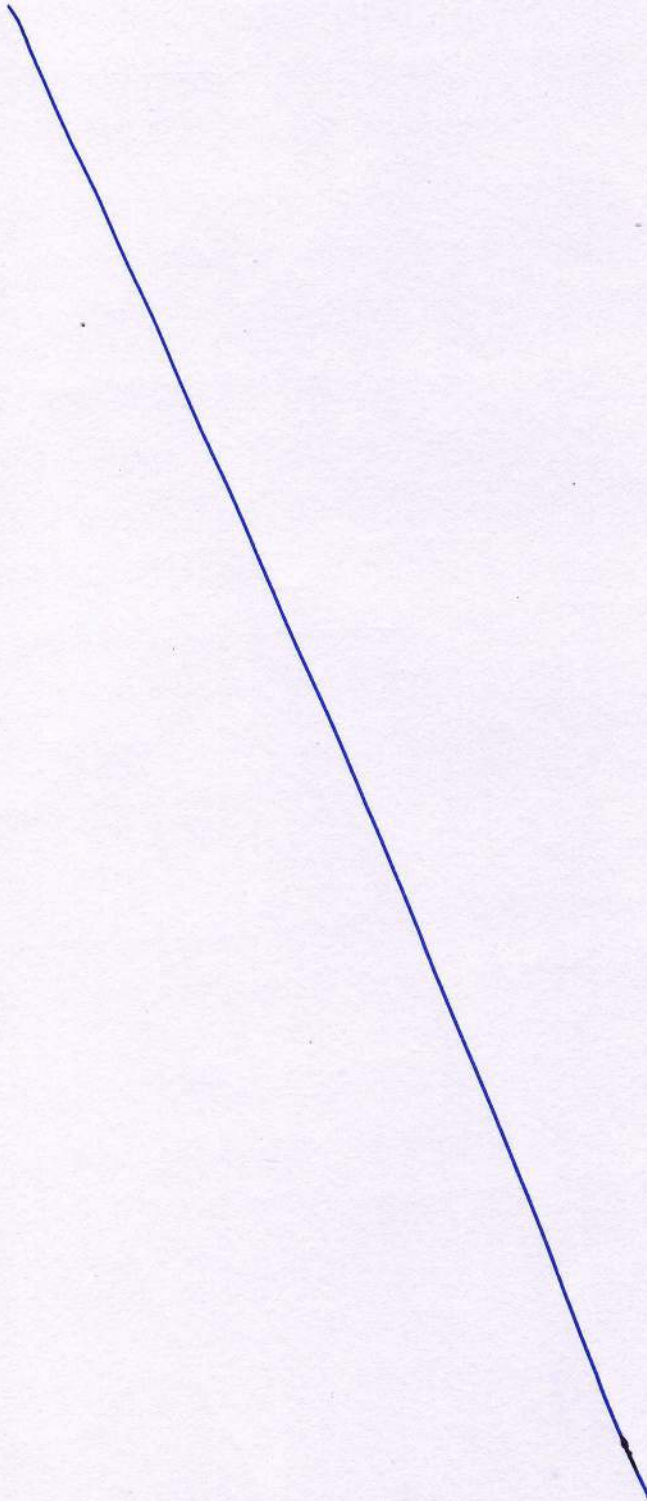
✓ Footloose industries are generally located near greenfield locations. They prefer to be away from the congestion and pollution of urban areas. Another reason is that many

✓ Electronic components require clean air and skilled migrants will also seek to counter-urbanise. The location of electronic industries in Shipherumbudur on the outskirts of Chennai is a classical example.

PRO.

- ✓ They will also locate themselves near similar industries to swap ideas and establish efficient linkages.
- ✓ They will be located near motorway and railway links to provide access to customers and transport components and products.
- ✓ They choose land on the edge of cities as it is cheaper than the central urban places. It provides an ideal location for building science and business parks.
- ✓ Lack of bureaucratic hurdles and availability of skilled engineers (who had gained reputation in US) in Bangalore was responsible for it becoming the IT hub of India.
- ✓ The industries will be located in places with good amenities like schools, hospitals etc as it will easily attract the skilled labour force.

In the coming decades, ~~with~~ we can see an expansion of footloose industries in the countries that will propel our economic growth.



4. What are the key factors responsible for the development of industrial clusters in India. Discuss with specific examples.

✓ Industry clusters are groups of similar and related firms in a defined geographic area that usually share common markets, technology, worker skill needs and often linked by buyer-seller relationship. Industries tend to concentrate in a few pockets because of certain favourable factors.

Mumbai - Pune cluster:-



(Major industrial regions)

✓ This region extends from Thane to Pune and in adjoining districts of Nashik and Solapur. Growth started in this area in 1774 when the island was obtained for construction of Mumbai port.

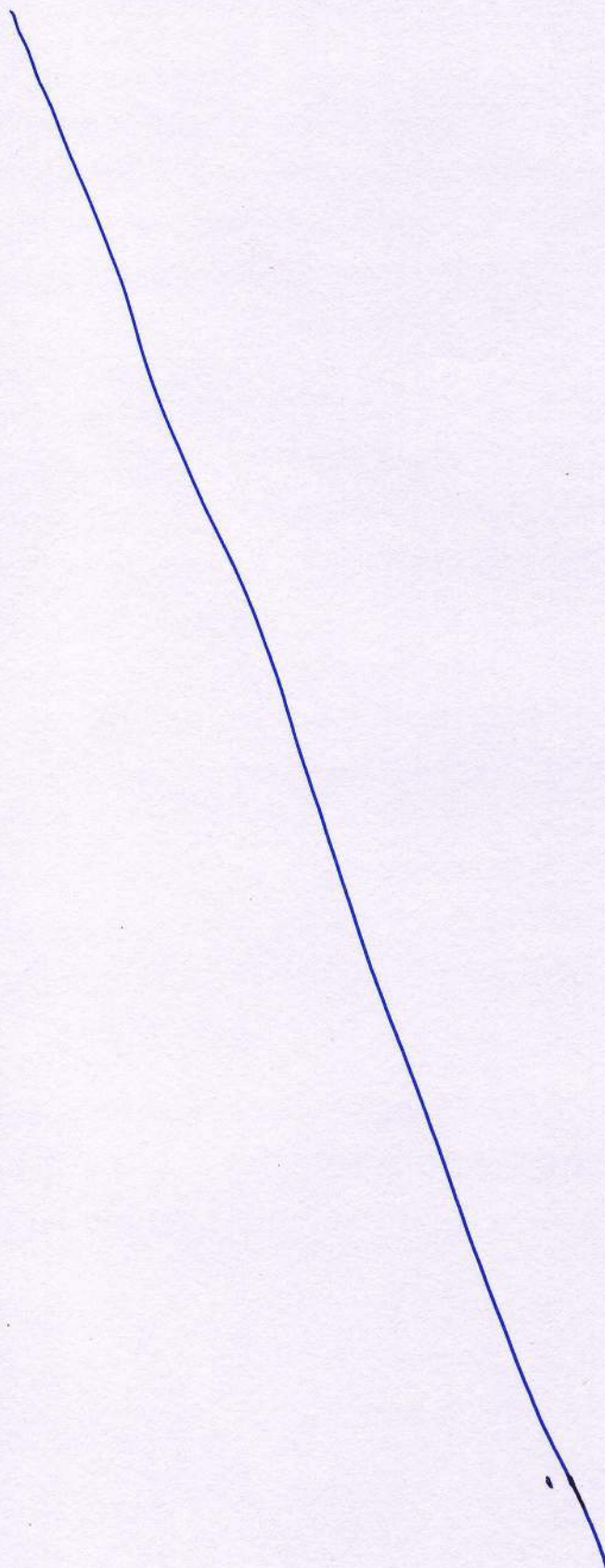
- ✓ The opening of railway track (1853), Bhor and Thalghat led to development of Mumbai.
- ✓ The growth of the region is connected to the growth of cotton industry. Hydel power was developed in Western ghats. Black soil in Narmada and Tapi basins favoured the growth of cotton.
- cheap labour from hinterland, port to facilitate export and import helped the industry grow.
- ✓ With it the chemical industry developed too. opening of Mumbai High petroleum field and

erection of nuclear power plants became a driving force. The subsequent industries like petrochemicals, fertilizers, pharmaceutical etc developed in the area making it a major industrial cluster in the country.

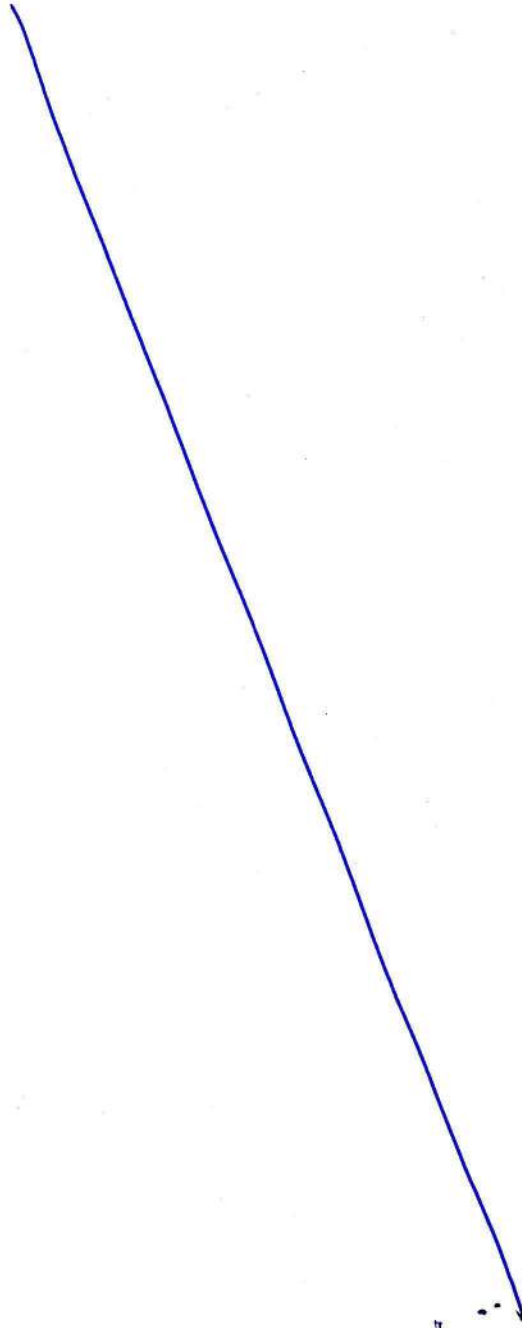
Chotanagpur cluster :-

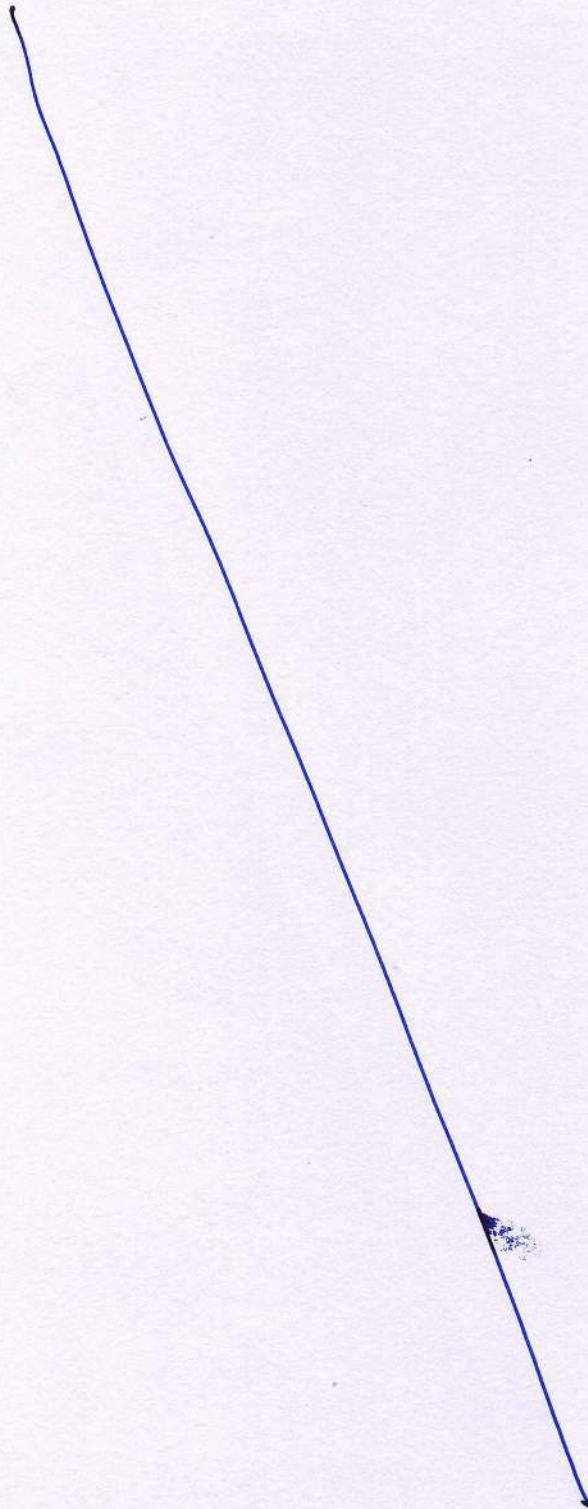
- ✓ The growth of this region is linked with discovery of coal in Damodar valley and iron ore in Jharkhand - Orissa. Power is easily available from dams in Damodar Valley and thermal power stations.
- ✓ cheap labour is available from nearby states of Jharkhand, Bihar etc. Kolkata is the biggest market for the produced goods. It also has port facility.
- ✓ Setting up of TISCO, Indian Iron Steel further aided the growth of other heavy engineering, machine tools and heavy electricals in the region.

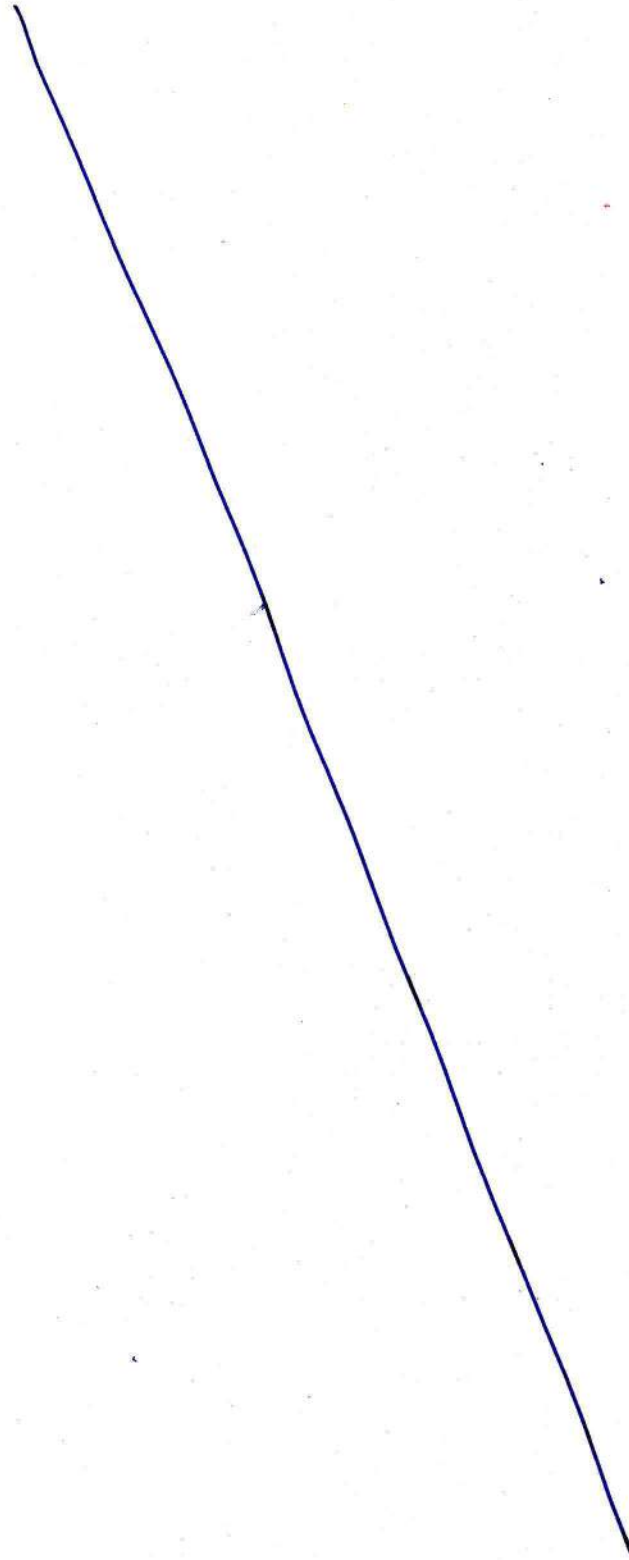
Industrial clusters are vital for the growth of the country and the government must take pro-active steps to develop these regions further.



5. Municipal Solid waste management is fast becoming a nightmare for citizens and local authorities in cities across India. Enumerate the steps taken by various municipal bodies to tackle this enormous problem in India. Can WtE (Waste to Energy) be a feasible solution to this fast growing problem?







6. India is the 3rd largest producer of coal in the world but commercial production of Coal Bed Methane has not yet started. What are the environmental and economic constraints associated with the production of coal bed methane in India?

✓ Coal bed methane extraction is a method for extracting methane from coal deposit. Though India produces large amount of coal, commercial scale has not yet taken off.

Environmental & Economic constraints :-

✓ Large amounts of water, sometimes saline brine are produced from coalbed methane wells.

The ~~the~~ environmentally acceptable disposal of brine is a major cost factor for economic methane production.

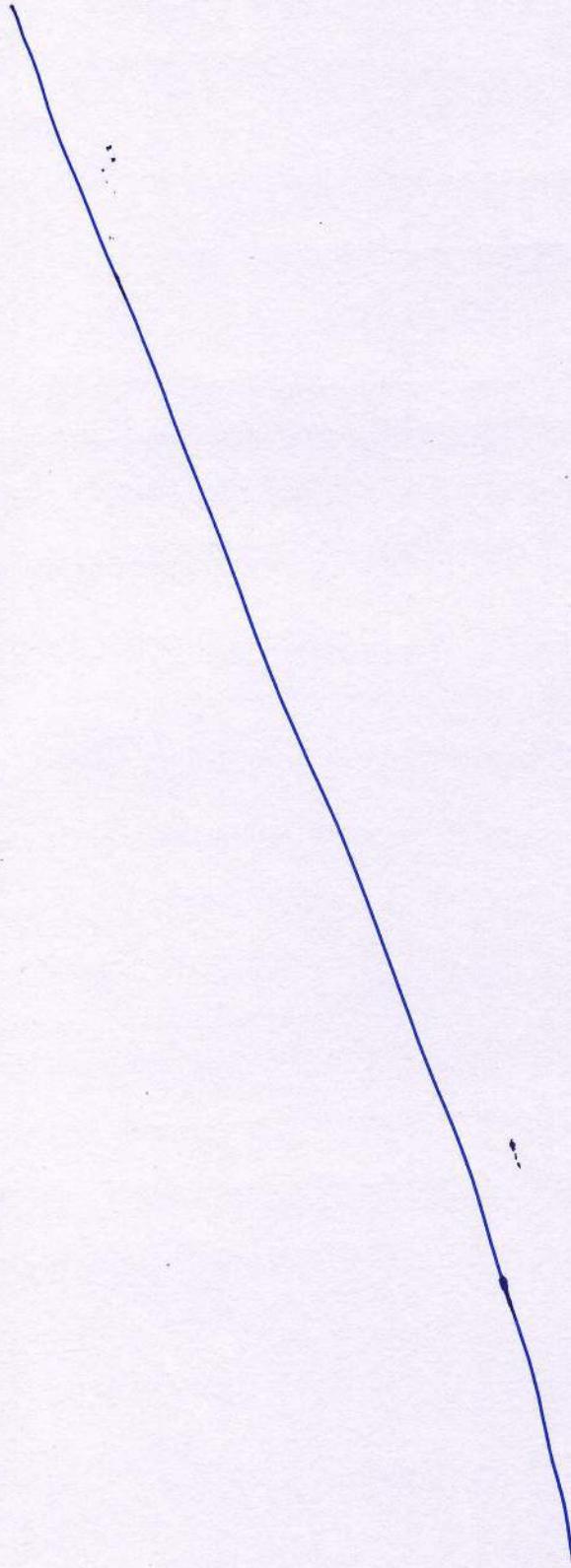
✓ The recent Kaveri delta project is being opposed by environmentalists as methane is extracted from great depths. This would lead to salt water encrustation which would render the entire Cauvery plains infertile.

✓ The extraction process is also said to discharge polluted water containing high levels of salt. It has resulted in killing of many plants and animals in the surrounding area.

PTO

- ✓ Like other carbon based fossil fuels, burning coalbed methane releases CO₂ in the atmosphere.
- ✓ The process of methane production also results in leak of fugitive methane into the atmosphere, which is harmful.
- ✓ India's natural resources of water are limited; and it will be stressed with the growing population. There is also the possibility of aquifer contamination while extracting methane.
- ✓ Lack of adequate technology and infrastructure for the extraction process has put stumbling blocks on many projects in India.
- ✓ In order to create a safe working environment, the procedure needs large amount of capital. Private-public partnerships will help ease the economic constraint.

India must pursue a sustainable approach to coalbed methane extraction to meet the energy needs of the country.



7. What are Rare Earth Elements? What are their uses? How is India positioned in the global distribution of these resources?

Rare earth elements:-

✓ Rare earth elements are a set of seventeen chemical elements in the periodic table, particularly the lanthanides, scandium and yttrium. Despite their name, they are abundant in nature, but they are very hazardous to extract. They have wide variety of uses.

uses:-

✓ Neodymium is used to make powerful magnets in loudspeakers and computer hard-drives to enable them to be more efficient and smaller.

✓ Lanthanum is used in camera and telescope lenses. compounds containing lanthanum are used extensively in carbon lighting applications - studio lighting and cinema projection.

✓ Cerium is used in catalytic converters in cars, enabling them to run at higher temperatures. They are also in the process of refining crude oil.

PTD

✓ yttrium is crucial in making television and computer screens and devices that have visual displays as they are used in making materials that give different colours.

✓ They are widely used in rechargeable batteries used in electronic devices. They can also be used to power electric and hybrid vehicles.

✓ They have critical defence applications as they are used for making equipments like night vision goggles, GPS equipment and precision guided weapons.

India and rare earth elements:-

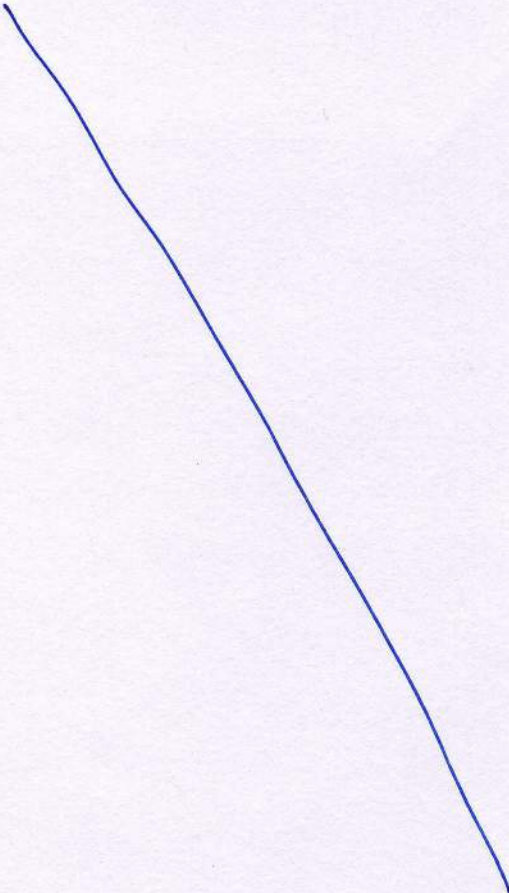
✓ India has the fourth largest reserves of rare earth elements in the world with ~~3.1~~ ^{3.4} million metric tonnes.

✓ until 1948, most of the world's rare earths were sourced from placer sand deposits in India. India has large reserves of monazite in the Kerala coast.

✓ India's position as a leading supplier was overtaken by china that now controls nearly 90% of the world supply.

✓ The encouraging factor is that India has recently commissioned a plant to produce upto 5000 tonnes of rare earths a year, which is expected to add five percent to the global supply. This move will benefit countries like Japan that seeks to lessen its reliance on china.

In the electronic age, rare earths have become essential. India needs to bring domestic resources into production and also secure overseas deposits to gain a global advantage.



8. Hydrofluorocarbons have emerged as contentious issue in climate talks. Discuss whether HFCs should be dealt with under Montreal or Kyoto Protocol.

✓ Hydrofluorocarbons are gases used for refridgeration and air conditioning. They are known as super greenhouse gases because their continual use and high global warming potential could undercut the benefits from reduction of other GHGs.

✓ They were introduced by the chemical industry to replace chlorofluorocarbons that has been phased out by Montreal protocol. However, with rising threat of HFCs, there is a debate whether to deal it with Montreal or Kyoto protocol.

Under Kyoto protocol :-

✓ Since HFCs are not ozone depleting, they are kept under Kyoto protocol as it contributes to global warming. They are treated as short lived climate pollutants under this treaty.

✓ It favours common but differentiated responsibilities which many countries are in favour of. With the current rate, it will be responsible for emitting 10 gigatonnes of CO₂ by 2040. The Kyoto protocol also has not been signed by all countries.

Under montreal protocol

- ✓ Montreal protocol is the most significant achievement in the environmental front. It has been responsible for phasing out nearly 97% of ozone depleting substances.
- ✓ It is ratified by all countries and will offer a better option to reduce the threat. It would involve a direct regulatory approach, guided by an expert panel, with funding made available to help developing nations meet the cost of adapting affected industries.

The way ahead ?

- ✓ Alternate technologies like HFO-1234yf that has a global warming potential that is 99.7% less than HFC needs to be encouraged in air conditioners.
- ✓ The montreal protocol is the right forum to tackle the issue ~~but~~ with reporting and accounting under UNFCCC. The decision must be arrived after a global consensus to tackle the menace.

9. "Lima call to climate action" represents progress before talks in Paris begin but few would characterise it as a resounding success. Elaborate. In this context what are the key pillars of India's stand on climate negotiations heading to the Paris round.

- ✓ The Lima Talks has been widely criticized for stalling progress on tackling climate action. The developed countries did not pledge to reduce their emissions from now until 2020. They also did not give any concrete assurance to provide finance & technology to developing countries.
- ✓ The principle of common but differentiated responsibility has been further diluted with the provision of Intended Nationally Determined Contributions where each country can decide their limits without any legal scrutiny.
- ✓ The developed countries are opting for a mitigation centric plan that will absolve them of their historic responsibility.
- ✓ However, the concept of INDCs has provided a common ground for countries to take further action on Paris talks.

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India's stand:-

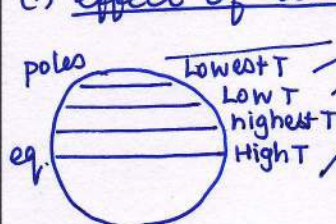
- ✓ India must ensure its path to development but at the same time we must increase share of renewables in our energy mix which will be our way of contributing to climate change.
- ✓ India must insist that there should be no reference to its annual emissions reduction till it achieves stabilisation. India can propose to peak its emissions in 2050.
- ✓ India can commit to a 25-30% reduction in intensity of carbon emissions below 2005 levels by 2025.
- ✓ We must take the lead in securing timelines and commitments on finance and technology. This would ensure support from small island developing states.
- ✓ We must apply pressure on developed nations to focus on an adaptation-centric approach with CDR.
- ✓ India must take the leadership in 2015 Paris talks to create a meaningful stance in protecting the environment.

10. "Change in latitude and altitude leads to variation in temperature and vegetation". Analyze.

✓ Latitude and altitude are important factors that influence temperature and vegetation.

Temperature:-

(i) effect of latitude :-



The temperature of a place depends on the amount of insolation received.

✓ The amount of insolation decreases poleward from the equator because the sun's rays are more oblique towards poles and vertically overhead at the equator.

✓ The temperature generally decreases from equator to poles but the maximum temperature is experienced in 20°N because in equator, major portion of insolation is reflected by clouds and in heat is lost via evaporation.

(ii) effect of altitude :-

✓ The temperature decreases with increasing height at an average rate of 6.5°C/Km .

because
✓ The major source of atmospheric heat is earth's surface from where heat is transferred via radiation, conduction & convection. So, the portion of atmosphere coming into contact with earth's surface gets more heat than the part lying above.

✓ The layers of air near earth's surface are denser and it contains more water vapour and dust particles than the upper layer. So, it absorbs more amount of heat radiated than the upper layers.

Vegetation :-

(i) effect of latitude :-

- ✓ The equatorial regions receive lots of sunshine and abundant rainfall that supports the growth of rainforests.
- ✓ In the mid-latitudes, there is little amount of rain due to subsidence of air masses. Here, evaporation exceeds precipitation and there is arid vegetation.
- ✓ In the warm temperate zones between 30°-45°N,S moderate rainfall supports growth of grasslands.
- ✓ In the higher latitudes, very low temperatures result in coniferous forests and in the polar regions, only mosses and lichens can be seen.

(ii) effect of altitude :-

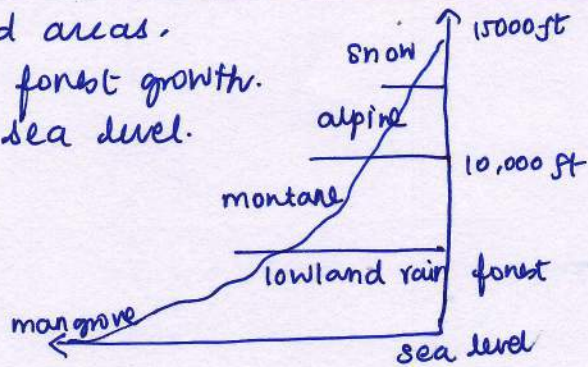
- ✓ As the altitude increases, the climate changes with air becoming colder and drier, affecting vegetation.

✓ In ~~tropical~~ lowland areas,
there is luxuriant forest growth.
mangroves occur at sea level.

✓ At high altitudes,
air pressure is less
and CO_2 is greatly
reduced. Growth
becomes stunted and trees become smaller and
we see growth of lichens and mosses.

✓ In the sub-alpine areas, the forests are
dotted with meadows and deciduous trees.

The impact of latitude and altitude has
given us a rich variety of vegetation and
diversified climatic conditions in the world.



11. It has been observed that the ozone hole develops over Antarctica, and not over manufacturing centers where chlorofluorocarbons are released prodigiously. How can you explain this phenomenon? Examine the possible health and environmental impacts of ozone depletion.

✓ Ozone depletion describes a steady decline of about 4% per decade in total volume of ozone in Earth's stratosphere. Though much of the depleting activity originates from other continents, ozone hole forms prominently over Antarctica.

✓ The ozone hole first appeared over Antarctica because atmospheric and chemical conditions unique to this region increases the effectiveness of ozone destruction by reactive halogen gases.

✓ The Antarctic weather is the only weather cold enough to form polar stratospheric clouds which does not happen in other regions.

✓ In these clouds, chemical reactions converts chlorine/bromine from CFCs to an active form, so that when there is sunlight, ozone is rapidly destroyed.

✓ By the time spring arrives and the sun comes back after long polar night, ozone levels are severe depleted. The prolonged period of sunshine only makes the condition worse.

Health impacts :-

- ✓ Ozone depletion leads to increased UV radiation which is said to cause cancer in skins. This phenomenon is quite prevalent in Australia.
- ✓ It is also said to cause malignant melanoma and cortical cataracts.
- ✓ Increase in tropospheric ozone is recognized as a health risk due to its strong anti-oxidant properties which makes it toxic.

Environmental impacts:-

- ✓ An increase in UV radiation affects crops like rice that are dependent on cyanobacteria residing on their roots for retention of nitrogen. The bacteria gets affected leading to failure of crops.
- ✓ Exposure to radiation has shown to affect orientation mechanism and motility on phytoplankton resulting in reduced survival. This affects the food web and subsequently the entire marine ecosystem as phytoplankton ~~must~~ forms the basic unit of food web.

Thus, urgent global action needs to be taken by all countries to tackle the menace of ozone depletion for a sustainable future.

12. Though the clamour for cleaner rivers has gained momentum in recent times, the task of reducing the pollution load of River Ganga is daunting. What are the major obstacles with respect to river cleaning projects in India? Critically examine the steps taken by the government in cleaning the Ganga.

✓ Ganga is considered to be the holiest river in the country. With increasing levels of pollution, the existence of river is threatened. In spite of various measures being taken, clean Ganga is yet to become a reality.

Major obstacles :-

- ✓ Massive inflow of sewage and industrial effluents makes the river clean-up a complicated mission. Daily, nearly 2700 million litres of wastewater are discharged while we have capacity to treat only 44% of it.
- ✓ The construction of dams along the course of river (eg: Tehri) has blocked the sediments reducing Ganga's self-purifying ability.
- ✓ The river flows through ~~7~~ states. They ~~not~~ have not been able to arrive on a consensus due to political differences.
- ✓ The central pollution control board has been ineffective in preventing the industrial discharge.
- ✓ Growing population and people's indifferent attitude and harmful traditions are proving to be a major challenge.

Government measures :-

- ✓ The major schemes implemented were the Ganga Action Plan (phase I and phase II) and the National Ganga River Basin Authority, which proved to be failures.
- ✓ Undue investment on technical aspects like creating sewage treatment plants without involving people on the banks is a major reason. The social aspects of pollution was ignored, and an engineering-centric approach was adopted.
- ✓ The ~~governor~~ schemes also had ~~vari~~ officers who handled various other posts and there was no strong motivation.
- ✓ The schemes sought inputs only from institutions like IITS while it should have approached various institutes of social sciences.
- ✓ It failed to control the encroachment of catchment areas that has reduced retention capacity of river.

Thus, ✓ The newly constituted National Mission for clean Ganga, incorporating its name in the ministry, involving NRIs and strong political leadership shows that we are on the right track.

13. "The potential of Inland Water transport (IWT) to encourage and support increased economic and social development is enormous". Discuss the factors responsible for the slow growth of IWT in India with special emphasis on geographical limitations. Enumerate some steps taken by the government in order to make this form of transportation competitive with respect to rail and road.

Inland Water Transport is a fuel efficient and environment friendly mode of transportation which has vast employment generation potential. Its immense potential has not been tapped and it contributes to only 1% of total transport in India.

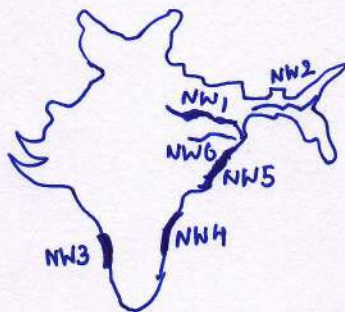
Slow growth of IWT:-

- ✓ Most navigable waterways suffer from problems like shallow water and narrow width of channel during dry weather. This problem usually occurs in rivers that are non-seasonal in nature.
- ✓ Increased deposition in the Himalayan rivers has resulted in meandering and silting of river beds that make it difficult for transport. Siltation has reduced navigability in Buckingham canal.
- ✓ Reduced flow due to diversion of water for irrigation (eg: Ganga) has made it difficult for the steamers to ply.
- ✓ Smooth navigation is hindered due to waterfalls, cataracts and sharp bends in the course of river. eg: Narmada Tapi

✓ Apart from these, absence of adequate infrastructure facilities like terminals for loading and berthing and surface road links prove to be a problem.

Steps taken by government:-

- ✓ To improve the IWT sector, the Inland Waterways Authority of India was set up. It has financial powers to sanction schemes involving capital expenditure upto Rs. 15 crores.
- ✓ Six national waterways have been declared by the government to improve transport facilities by giving greater focus.
- ✓ The Directorate General of Shipping has granted exemptions to Indian ships exclusively carrying cargo on local routes.
- ✓ Private investment needs to be ramped up in the sector to improve the infrastructure facilities in the existing waterways.



✓ Thus, the IWT needs to be developed in a holistic manner so that more population living in remote areas can be part of the inclusive growth of our country.

14. Noise pollution is one of the emerging environmental concerns in India. Bring out the underlying factors and list the legislative measures adopted to tackle the issue.

✓ Noise pollution is the disturbing or excessive noise that may harm the balance of human and animal life. The major sources are machines and transportation systems. It has become a menace in our country that needs to be addressed quickly.

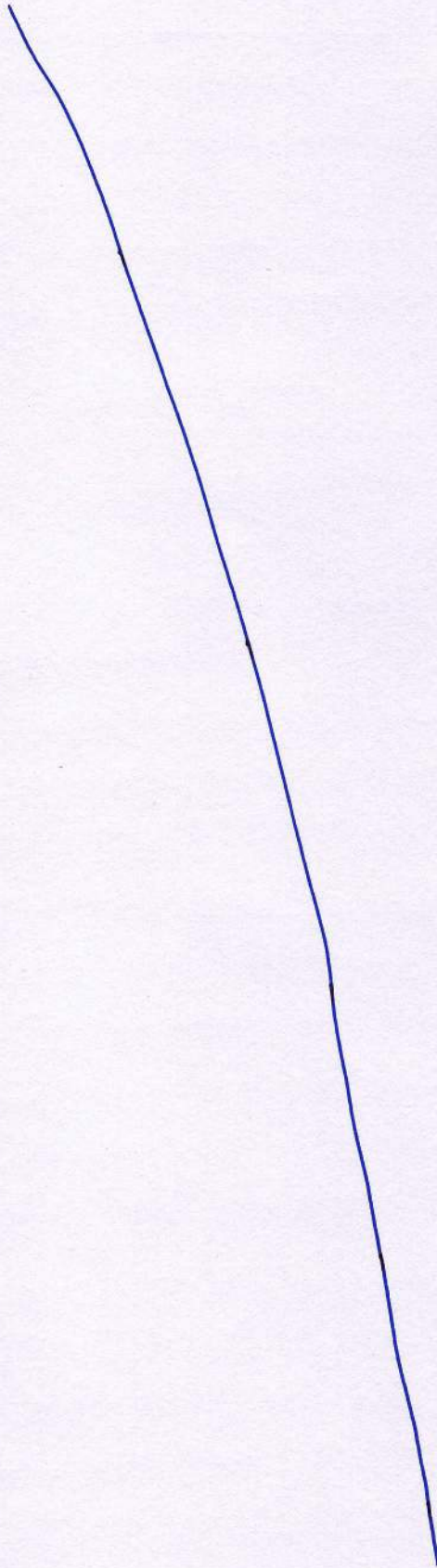
Environmental concerns:-

- ✓ Noisy areas lead to reduction of usable habitats for wild animals. In the case of endangered species, it will hasten the process of extinction.
- ✓ It can increase the death by changing delicate balance in prey detection and avoidance and interfering in sounds of animal communication. Acoustic overexposure can lead to loss of hearing in animals.
- ✓ Noise makes species communicate more loudly, which is called hombard vocal response. The animals' noises masked by anthropogenic sounds may make them victims of prey. It will lead to a situation where the whole ecosystem will ~~be~~ speak loudly.
- ✓ It has been found that noise pollution can lead to poor quality of crop growth.

Steps taken by government:-

- ✓ For better regulation of noise pollution, the government enacted The Noise Pollution Rules, 2000 that specifies air quality standards and gives power to state government to take measures for abatement of noise.
- ✓ Under law of torts, a civil suit can be filed claiming damages for the nuisance created by noise pollution.
- ✓ In the model rules of Factories Act, limits for noise exposure for work zone area have been prescribed.
- ✓ Even, the constitution under Article 21 has interpreted right to life includes to live in peace and comfort without noise.
- ✓ In 2011, the Central Pollution Control Board established the first part of noise polluting monitoring network in 35 major cities in India.
- ✓ Measures such as not bursting crackers after 10 pm & banning use of speakers for religious propagation are laudable.

At present, there is no specific legislation to control noise pollution. The government should pass the Noise Pollution Control Act, enact a city noise control code for major cities and incorporate preventive measures in planning process.



15. Jute, "The Golden Fibre" enjoys significant ecological and economic advantages over other fibres yet it has been struggling to survive. In this context, discuss the problems associated with the Jute Industry in India. To what extent can the Jute Technology Mission address the same?

✓ The jute industry is a very old industry in our country, predominantly in the eastern part. In spite of being cheap and eco-friendly, the industry faces many setbacks.

Problems faced by the industry :-

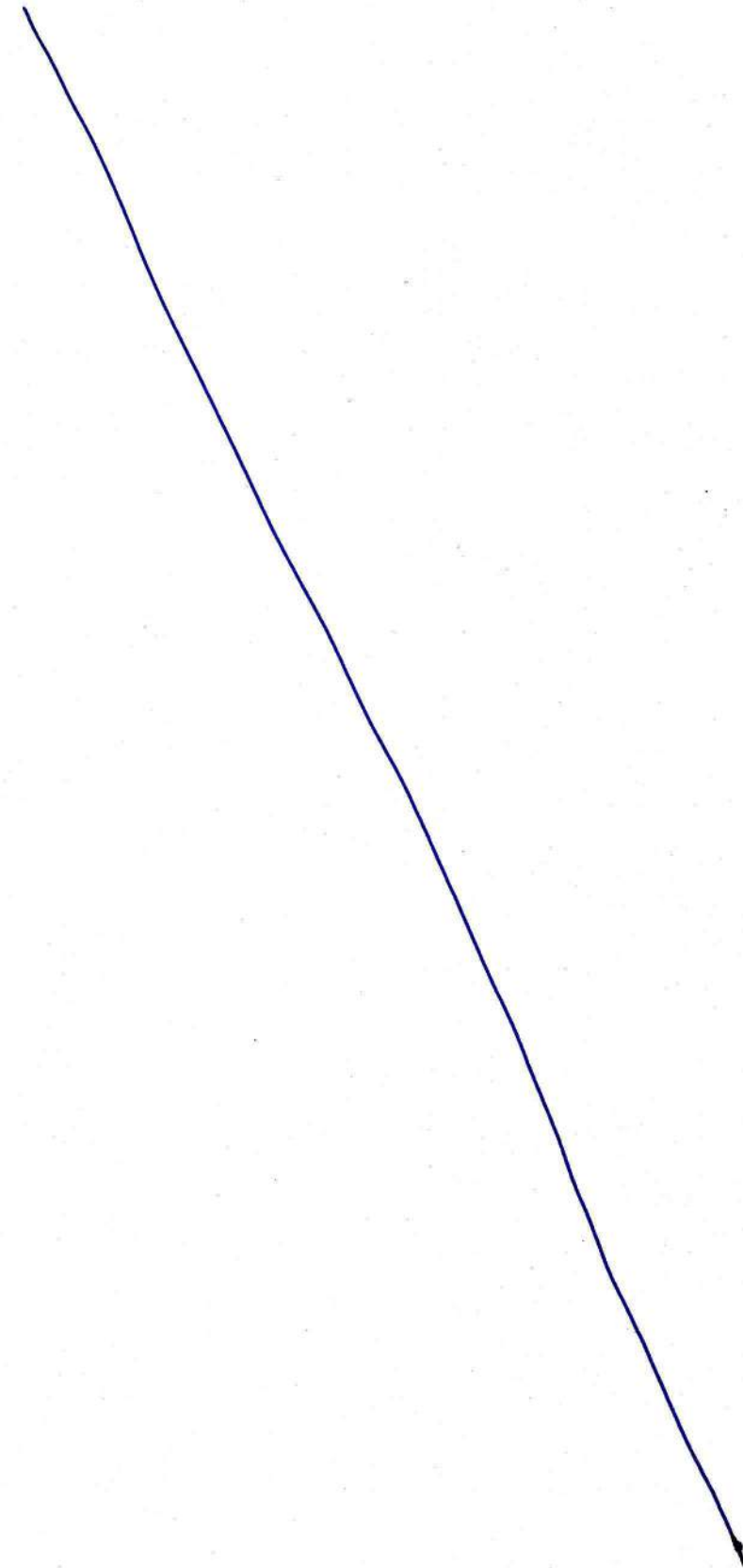
- ✓ The first major setback was due to partition of the country in 1947 when 81% of the jute output went to erstwhile East Pakistan. The acute shortage of raw jute has been a problem since then.
- ✓ Most of our customers could not get Indian jute products during world war II as a result of which several countries developed many substitutes for jute. Today, our jute industry faces tough competition from synthetic packing materials of western countries.
- ✓ Our mills do not have high quality machines and our edge in market is lost to Bangladesh that are able to produce much better products.
- ✓ Since equipments used in production are outdated, there is a high cost of production which makes the products costlier and unviable.

✓ Storage of raw jute and shortage of power supply leads to under-utilization of existing capacity.

Jute Technology Mission:-

- ✓ The Jute Technology Mission seeks to address the problems ailing it and reviving the moribund industry. The mission will be operationalised through four mini-missions.
- ✓ Mission-I will focus on strengthening research & technology activities for development of improved varieties and protection technologies for jute and allied crops. This will ensure availability of good quality seeds and short duration crops to jute growers.
- ✓ mission-II seeks to transfer technology through extension to farmers. This will enable improvement in quality of crops.
- ✓ mission-III will try to develop efficient market linkages and update infrastructure facilities. This will help farmers to get a fair market price and reliable information.

With growing environmental concerns, India can utilize the opportunity to revive its jute industry and emerge as a global leader.



16. Account for the change in spatial pattern of the Pharmaceutical industry in India. Elaborate on prospects of this industry in the country.

The pharmaceutical industry in India is the world's third-largest in terms of volume. The Indian pharma industry is dominated by foreign companies having subsidiaries in India due to cheap availability of labour.

changing spatial pattern:-



shifting location of
pharma industries

✓ The pharmaceutical industry grew in Bombay, Gujarat and Baroda during WWI due to steep increase in local demand for allopathy medicines and stoppage of imports.

✓ During WW2, western companies began to set up their operations in Mumbai. The reason for its growth in western region was the development of chemical industries in the area. This ensured availability of raw materials for medicinal preparations.

✓ In 2002, Himachal Pradesh and other hill states offered excise duty exemption on finished products, income tax exemption and capital investment subsidy in plant and machinery. Sikkim was included in North East and Industrial, ^{& Investment} promotion policy 2007.

as a part of which the industries got subsidy. Also, the cold climate favours medicinal preparations. This saw a shift of industries from plains to hill states.

✓ In the hill states, the industries faced technical manpower shortage and power failures which increased their operational costs.

✓ Once the tax holiday ended in 2010, the industries have started to relocate to plains and Maharashtra where SEZs are created for them.

Prospects:-

✓ India has a vast pool of trained pharmaceutical scientists, doctors & researches which opens up avenues for joint research.

✓ low cost of skilled manpower, manufacturing and operations will result in many companies to make in India.

✓ growing per-capita income of the population will increase affordability of medicines. Increased life expectancy has resulted in a significant old age population who need medicines.

✓ India's production of generic medicines could be utilized to tap the rural areas.

With proper pricing policies, IPRs and innovative solutions, Indian pharmaceutical industry should look to alleviate the health problems in the country.

17. Illustrate the socio-economic significance of local winds across the world with special emphasis on India.

Local winds are small scale convective winds of local origin caused by temperature differences. They are strongly influenced by local terrain. Besides having impact on the climatic conditions, they also have socio-economic importance.

Chinook and Foehn :-



Warm and dry local winds blowing in leeward sides of mountains are called chinook in USA and

foehn in Switzerland.

- During winter, chinook rises the temperature and green pastures are open along the eastern slopes of Rockies. This helps in early sowing of spring wheat.
- Foehn also helps in early sowing and ripening of grapes.

Mistral :-

- Mistral is a cold local wind which blows in Spain and France from north-west to south east direction.



- It is known to bring good health since the dry air dries stagnant water and the mud. It also blows away pollution from the skies over large cities and industrial areas.

✓ The wind is capable of drying up the local vegetation making it susceptible to forest fire.

Loo:-

✓ The loo is a strong, hot and dry summer afternoon wind which blows over western Indo-gangetic plain in North India.

✓ Many birds and animals succumb to loo in summer months, especially in deforested areas.

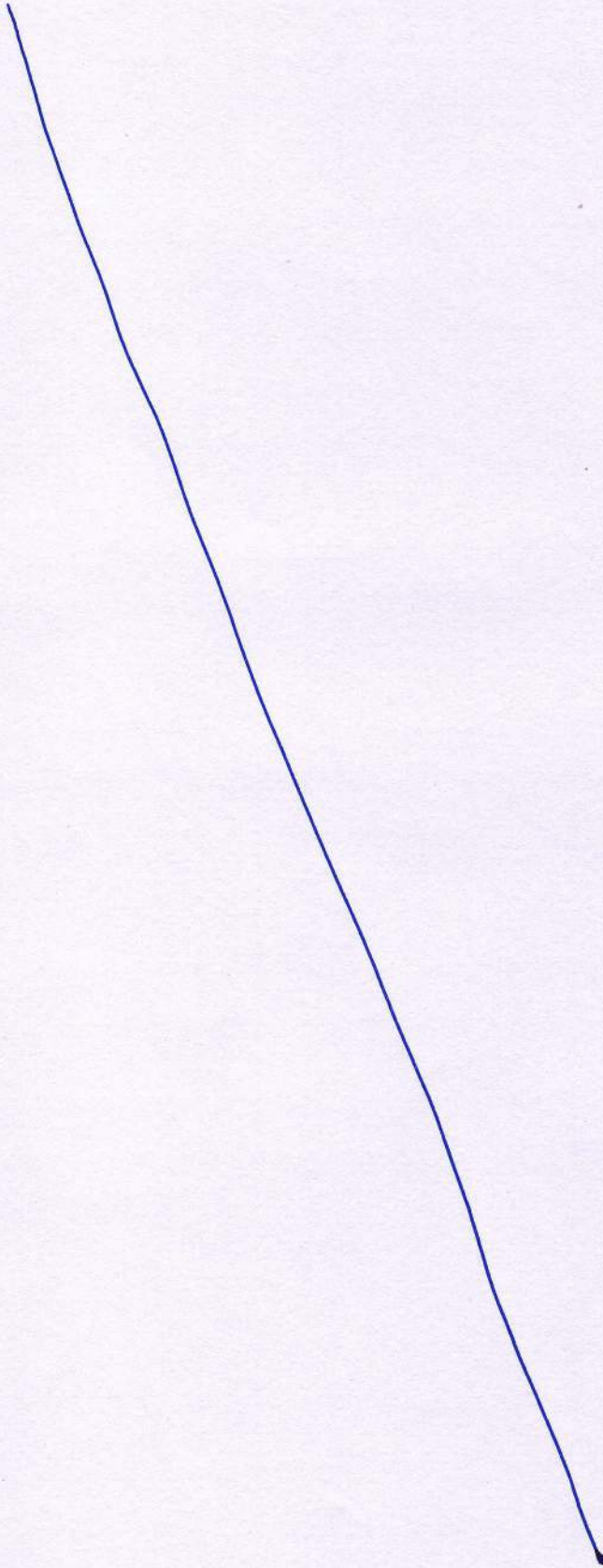
✓ Insect population reduces and hence the chances of malaria has also gone down.

Mango shower:-

✓ Towards the end of summer, there are pre-monsoon ~~showers~~^{winds} which are common in Kerala and coastal Karnataka. They help in early ripening of mangoes.

Kalbarisakhi is useful for tea, rice and jute cultivation in Assam and West Bengal.

Thus, the local winds play a major role in determining the economy and lifestyle of a particular area.



18. How do global pressure belts explain the formation of climatic regions across the world?

✓ Pressure belts are identifiable zones or bands of homogenous pressure regimes. There are seven pressure belts in the world - equatorial low, sub-tropical highs, sub-polar lows and polar highs.



(i) Equatorial low pressure belt

✓ This belt lies between 10°N and 10°S . Due to intense heating, air gets warmed up and rises over the region forming pressure belt. It is characterized by extremely low pressure with calm conditions. Surface winds are absent. Due to intense heating, there is convection and abundant rainfall with high humidity.

(ii) Sub-tropical high pressure belt:-

✓ The sub-tropical highs extend from near the tropics to about 35°N and S. The high pressure is due to subsidence of air coming from equatorial regions which descends after becoming heavy. The subsiding air is warm and dry and hence most deserts are found along this belt. The belt is also frequented by tropical and extra-tropical disturbances.

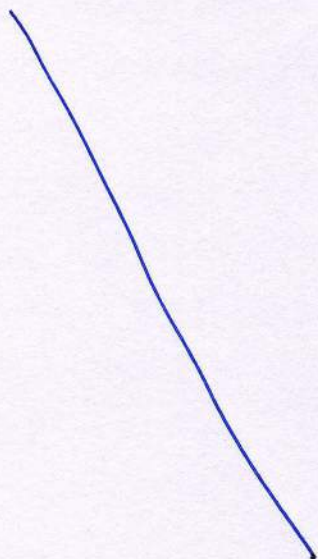
(iii) Sub-polar low pressure belt :-

- ✓ This belt is located between 45° N and S latitudes and the Arctic and Antarctic circles. The low pressure exists along the belt due to ascent of air as a result of convergence of westerlies and polar easterlies.
- ✓ Due to great contrast between the temperatures of the winds from sub-tropical and polar source regions, cyclonic storms or lows are produced in the region.
- ✓ The region is characterized by moderate rainfall and cool climate

(iv) Polar high

- ✓ Due to extremely cold temperatures at the poles, there is subsidence of air causing the polar high pressure belt.

Thus, the pressure belts play a major role in determining the climatic regions of the world.



19. The recent oil spill in Sunderbans has been termed as an ecological catastrophe by environmentalists. In light of the above fact explain the impact of oil spill on marine ecosystem. Further, suggest some measures required to deal with this environmental risk.

✓ Oil spill is the release of liquid petroleum hydrocarbon into marine areas due to human activity. The recent Sunderban oil spill has affected the ecosystem greatly.

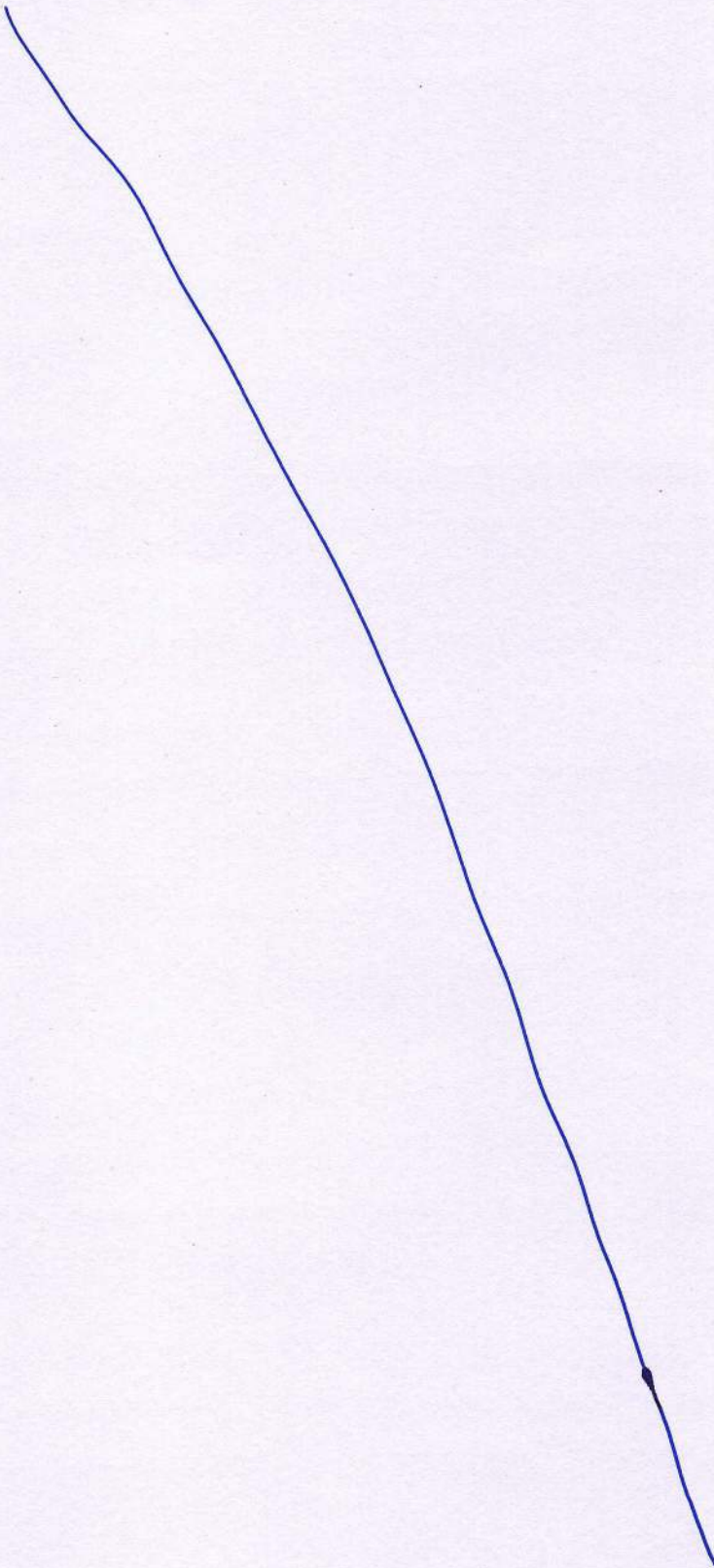
Impact of oil spill:-

- ✓ The spill occurred in a protected area, which is home to rare Irrawaddy and Ganges dolphins. The smell of oil will make it difficult for wild animals to breathe.
- ✓ It poses a major threat to food cycle as it affects the microorganisms that constitute the primary level.
- ✓ A thick layer of oil deposits on the surface of river which cuts down the supply of dissolved oxygen.
- ✓ When high tide occurs, mangroves go under water and once the water recedes, the oil layer covers the vegetation and enters the soil causing damage.
- ✓ The oil penetrates into plumage of birds and fur of mammals reducing its insulating capability and making them vulnerable to temperature fluctuations.

'It also affects birds' ability to fly, confuses animals that rely on scent and harms the digestive tract.

Measures :-

- ✓ A no-go zone must be declared near protected areas and commercial vehicles must be prevented from passing through.
- ✓ Environmental Sensitivity Index Mapping must be used to identify sensitive shorelines in order to prepare for protection strategies. By planning ahead, impact on environment can be reduced.
- ✓ Bioremediation by using biological agents like *Alcanivorax* to break down the oil can be employed.
- ✓ Solidifiers like hydrophobic polymers can be used that clean up oil leaks by changing physical state of oil.
- ✓ A stringent law must be passed to curb the menace of oil p-leakage. International collaboration can be undertaken with similarly interested countries eg: Ind - Bang.
- ✓ Thus, the menace of oil pollution needs to be curbed holistically with immediate effect by involving multiple stakeholders.



20. TSR Subramanian report on environmental laws emphasized that the problem with respect to environment in India is not of legislative deficit but of Institutional and implementation deficit. Discuss and suggest measures to overcome the above problem.

- ✓ India has one of the strongest legislative framework regarding environment in the world but faces continuous environmental problems due to institutional and implementation deficit
- ✓ An umbrella organization called the National Environment Management Authority (NEMA) along with state bodies (SEMA) needs to be set up. They will be in charge of project clearances and monitoring compliance with environmental regulations.
- ✓ Bodies such as central and state pollution control board will be subsumed under NEMA and SEMA to avoid duplication of work.
- ✓ The NEMA will be insulated from political interference. It will have a strong legal cell so that they can process cases, conduct proper investigation and prosecution.
- ✓ The project proponent will inform government about quantum of pollution from industrial unit. He/she will be required to submit a compliance report that will be placed in public domain. Failure to provide information will lead to severe penalties.

- ✓ greater use of technology via satellite, GPS, GIS to ensure that the industries follow environmental safeguards will be employed.
- ✓ Special environmental courts will be set up at the district level, chaired by a sessions judge. Above that, one or more appellate boards comprising of serving secretaries to GoI and HC judge will address the issue of dispute resolution. The National Green Tribunal will continue to have its powers of technical and judicial review.
- ✓ An environmental reduction cost should be assessed for each project on the basis of damage caused by to environment and should be added to cost of project. It should be recovered as tax or duty from project proponent during life of project. A fund needs to be constituted for the purpose.
- ✓ A separate cadre of Indian Environmental Service needs to be created to usher in highly skilled people with best practises.

The need of the hour is to ensure laws are implemented with greater responsibility, accountability and transparency, so that our environment can be conserved efficiently.

