

Mains 2019 GS Test Series
Test – 11 Environments, Disaster Management and
Internal Security
Sample Answer

1. Recently government has decided to open commercial coal mining for private sector and approved the methodology for auctioning of coal mines. Discuss the pros and cons of this step. (10 marks; 150 words)

An official statement described the decision as “the most ambitious coal sector reform since the nationalisation of this sector in 1973”. An enabling provision for commercial coal mining by private players was included in the Coal Mines (Special Provisions) Act, 2015.

- There will be no end-use restriction as far as output of the auctioned mines are concerned.
- Coal blocks will be allocated by “ascending forward auction” in which the winner will be determined by the price per tonne of coal offered to the state government where the mine is located.
- no restriction on the sale and/or utilization of coal from the coal mine,” said the statement.
- methodology approved gives highest priority to transparency, ease of doing business and ensures that natural resources are used for national development.

Pros

- game changing move that puts an end to state-backed Coal India Ltd’s (CIL) monopoly
- enables power, cement and steel producers to access fuel more efficiently.
- set to usher in competition in coal supply
- Will reduce coal imports
- Help stressed power plants to attempt a turnaround through better fuel management.
- use of best possible technology in the sector, drive investments and create direct and indirect employment in coal bearing areas.
- The government expects revenue from private commercial mining to help in the development of backward areas, especially in the eastern part of the country.

Cons

- Competition in coal mining sector will lead to fast extraction of resources
- If not regularized it will harm environment

2. What are micro plastics? Discuss how micro plastics have emerged as one of the biggest threat to the environment across the world. (10 marks; 150 words)

Microplastics are small plastic pieces less than five millimeters long which can be harmful to our ocean and aquatic life.

Microplastics come from a variety of sources, including from larger plastic debris that degrades into smaller and smaller pieces. In addition, microbeads, a type of microplastic, are very tiny pieces of manufactured polyethylene plastic that are added as exfoliants to health and beauty products, such as some cleansers and toothpastes. These tiny particles easily pass through water filtration systems and end up in the ocean and Great Lakes, posing a potential threat to aquatic life.

- ✓ Nearly eight million tonnes of plastic – bottles, packaging and other waste – are dumped into the ocean every year. This plastic waste is then killing marine life and entering the human food chain.
- ✓ If current pollution rates continue, there will be more plastic in the sea than fish by 2050, said the United Nations Environment Programme (UNEP).
- ✓ Micro plastics (particles of less than 5 mm) such as those used in scrubbers and cosmetics, ingested by

marine animals can cause accumulation of certain chemicals and result in physiological impacts. Micro plastics can impair reproduction and development and alter how species function. Human health concern:

- Micro-plastics hold the potential for both bioaccumulation and biomagnification and may thus finally end up in the human body.
- But based on current limited knowledge on the effects, there is little human health concern. Some plastic under 150 microns (0.15 millimetres) could enter the gut's lymphatic system.

STAINED SPARKLE?

Risks associated with exfoliating agents used in personal care products has alarmed green panel

What are microbeads?

○ Microbeads are plastic pieces or fibre measuring less than 1 mm

What are microbeads made of?

○ Microbeads used in personal care products are mainly made of polyethylene (PE), but can be also be made of polypropylene (PP), polyethylene terephthalate (PET), polymethyl methacrylate (PMMA) and nylon

What are they mainly used in?

○ They are widely used in cosmetics as exfoliating agents and in personal care products such as toothpaste, as well as in biomedical and health science research. In layman's language, these microbeads are so small that a person can barely feel them. Their roundness and particle size create a ball-bearing effect in creams and lotions, resulting in a silky texture and spread ability



Why is it used?

○ Microbeads have been used to replace natural exfoliating materials. Microspheres in different colors add visual appeal to cosmetic products because of which their usage is becoming more rampant

What is the danger from them?

Microbeads — largely non-biodegradable — flow through sewer systems and end up in seas and oceans, where they contribute to the huge chunk of plastic soup in the environment

Microbeads are also likely to be transported to wastewater treatment plants. Due to their small size, a substantial proportion passes through the filtration system and enters aquatic environments

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- It may pass from the bloodstream to the kidneys or liver.
- But how plastic behaves in the gut is still based on assumptions from scientific models and not from proper studies. Also, the knowledge on the various chemicals present in plastics is limited.
- So the health impact may not yet be clear, but indisputably these are contaminants.
- Research evidence from complementary fields indicates that accumulation of these chemicals can induce or aggravate immune responses in the body.
- ✓ They also not constrained by national boundaries, because it migrates via water and air currents and settles in benthic sediments.
- ✓ Majority of ocean's area is beyond national jurisdictions which resulted into "garbage patches" in oceanic gyres by the accumulation of plastic waste from different nations. Like Great Pacific Garbage.
- ✓ Unlike POPs (Persistent Organic Pollutants) or chlorofluorocarbons (CFCs), Plastic pollution has received little attention in terms of international agreements.
- ✓ The health impact of the presence of polypropylene, polyethylene terephthalate and other chemicals in drinking water, food and even inhaled air may not yet be clear, but indisputably these are contaminants.

No single solution will stop marine plastic pollution. Hence an internationally agreed and a legally binding instrument are required.

3. How is increasing man-animal conflict is a serious threat to biodiversity in India. What steps needs to be taken to control such conflicts. (10 marks; 150 words)

Ans: Man wildlife conflict is the negative impact of man's activities on the habitat and resources of the wild animals due to growing human populations overlap with wildlife territory. Human-wildlife conflict refers to interaction between wild animals and people and resultant negative impact on people or their resources, or wild animals or their habitat.

What are the causes of man-animal conflict?

- Due to habitat fragmentation and shrinking of habitat due to encroachment in forest lands, people and animals are increasingly coming into conflict over living space and food.
- Encroachment in the forest lands by local people has resulted in shrinkage of wildlife habitats especially on the fringes which has increased the pressure on the limited natural resources in the forest areas.

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- Increased disturbance due to collection of fuel wood, fodder, water etc. from the forests has also increased the incidences of man-animal conflict
- Increase in area under cultivation around wildlife habitats and changed cropping pattern have also contributed to increased man-animal conflict.
- Decreased prey base caused by poaching of herbivores has resulted in carnivores moving out of forest in search of prey
- Increasing livestock population: Domestic animals often outnumber wild ungulates within protected areas. Livestock has become an important source of prey for predators
- Climate Change and its effect through drought, floods, forest fires, destruction of habitat and food will aggravate the problem of human-animal conflict

According to data from the Ministry of Environment, Forests and Climate Change, conflict with wild animals (mostly elephants and tigers), has killed more than 1,100 people across India between 2014 and 2017.

Steps to be taken:

- Since habitat loss, degradation and fragmentation are the root causes of the human-wildlife conflict, they need to be addressed to provide long-term solution to conflict
- Crop pattern needs to be checked. Crops like sugarcane, Banana, should not be allowed to be grown near forest areas. These crops attract wildlife for food as well as good hiding place.
- Good standards of waste management are important to avoid attracting wild animals to human settlements and to prevent animals being artificially sustained by human induced food availability.
- The population of wild ungulates, namely hares and the wild boars should be increased as these act as prey for wild carnivores
- Forest corridors linking protected areas must be maintained where they exist, or created where they don't. Other measures such as swift delivery of compensation for livestock loss, property damage, or life lost due to conflict are important, but they are not long-term solutions
- Communities should be incentivised for not to harm wild animals that pass through their lands. For this it is important to provide quick compensation, insurance for any economic loss
- Capacity development of forest officials is important. Fully equipped quick response team should be deployed as when conflicts arise
- Relocation of local communities to areas offering better access to natural resources and socio-economic opportunities is an important measure to negate potential human-wildlife conflicts

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Education and training activities at different levels should be taken up for disseminating innovative techniques, building local capacity in conflict resolution and increasing public understanding of man-animal conflicts

4. **“Although droughts in India are a recurring phenomenon; there is no coherent policy mechanism to deal with it comprehensively. As a result, the severity of this disaster increases significantly”**. Comment. **(10 marks; 150 words)**

Explain first how drought in India is a recurring phenomenon and give supporting stats. Explain policy framework of centre as well as state govt regarding drought. Show how both of these lacks coherency, synergy, coordination and comprehensiveness which is utmost critical for drought. Then explain how this policy mismatch increases severity of drought e.g. Migrations, water table, food and fodder production and so on. Conclude by giving suggestions on integrated policy.

5. **What do you understand by Integrated Flood Management? Elaborate how this method can help to mitigate the flood related damages in India?** **(10 marks; 150 words)**

Integrated Flood Management (IFM) is a new approach to flood management which is based on the concept of Integrated Water Resources Management (IWRM). IWRM is a process which promotes the coordinated management and development of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. Integrated flood management joins the sum of all operational activities to be taken before, during and after an event as well as political and administration decisions that are aimed at preventing or mitigating a flood event or even a flood disaster.

How IFM will mitigate floods in India :

- Traditional flood management has focused on defensive practices (flood control and protection by structural measures, e.g. dikes) only, integrated flood management is a proactive management of risks due to flooding.
- Being a holistic approach, IFM emphasizes the links between flood management and socio-economic development as well as the protection of natural ecosystems.
- Manages the water cycle as a whole
- Integrate land and water management
- Adopts a best mix of strategies

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- Ensures a participatory approach
- Adopts integrated hazard management approaches
- Reducing Flooding:: Dams and reservoirs Dikes, levees, and flood embankments
- Reducing Susceptibility to Damage:: High flow diversions Catchment management Channel improvements Flood plain regulation Development and redevelopment policies
- Mitigating the Impacts of Flooding:: Design and location of facilities, Housing and building codes, Flood-proofing, Flood forecasting and warning Information and education, Disaster preparedness, Post flood recovery.
- Preserving the Natural Resources Flood plain:: Flood insurance zoning and regulation of Flood Plains.



6. How vulnerable is Indian coast to the oil spill? How it impacts the Indian coastal ecosystem and communities? (10 marks; 150 words)

Release of petroleum into environment, esp marine ecosystem. Due to human activity and is a form of ocean pollution.

Vulnerability:

- ✓ 7500 km of indian coast
- ✓ 97% trade by volume through Indian ocean
- ✓ Major trade route for trade.

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- ✓ Exploration and extraction of oil & gas – Mumbai High, Cambay basin, KG basin etc.
- ✓ High maritime traffic - 40% of global energy supply - Persian Gulf to Europe & Asia is IOR..

Impact:

- ✓ Immediate fire hazard - poisonous fumes – choking rig workers and inhabitants near the shores. lead to fatalities to workers.
- ✓ Effects both marine and coastal ecosystem. Shoreline – oil washes up – coating sand, rock, plants and animals with oil. Sand covered with oil can support vegetation. Wildlife after eating contaminated vegetation become sick or may die.
- ✓ Formation of oil bars and tar balls

7. Role of non-state actors is important as far as security relation with neighbours is concerned. Critically analyse the significance of bilateral relations between India and its neighbours in fighting non-state actors posing security threat to India.

Neighbourhood in an unfavourable, troubled and uncertain environment. Non-state actors like transnational organized crimes, drug trafficking & international terrorism act as major challenges.

Bilateral cooperation with neighbours in combating threat from non-state actors:

Afghanistan

Areas of cooperation: Emergence of Taliban regime in Afghanistan which is a proxy of Pakistan and dominated by Islamic fundamentalists would not be in the interests of India. To counter this, under its strategic partnership agreement, India is providing training to Afghan Security forces.

Contentions: Tensions between India and Pakistan cast a shadow over Afghanistan, with India's development assistance under attack.

Bangladesh:

Areas of cooperation: Regular Indo-Bangladesh Joint Training Exercise is held to build and promote counter-insurgency and counter-terrorism operations.

Contentions: Indo-Bangladesh border is of porous nature which provides pathway for smuggling, trafficking in arms, drugs and people. Presence of radical groups like Jamaat-e-Islami in Bangladesh and their activities can spill over to India too.

Myanmar:

Areas of cooperation: Myanmar has upheld the policy of not allowing any insurgent group to utilise Myanmar's soil to undertake hostile acts against the Indian government. Institutionalised cooperation through regular coordinated patrolling initiatives, bilateral maritime cooperation in non-traditional security domains also have been established between the nations.

Contentions : Risk of radicalization amongst the displaced Rohingyas, the emergence of a new insurgent group Arakan Rohingya Salvation Army (ARSA) - led by Rohingya émigrés in Saudi Arabia, illegal migrants from Myanmar add to the terror threat in North East.

Pakistan

India's efforts to contain Pakistan have yielded very few dividends. Presence of Islamic terrorist groups like the Al-Qaeda and LeT, training and facilitation to armed insurgents that include Kashmiri militants and Sikh Separatists by ISI in various training camps in Pakistan makes the challenges more severe. Drug trafficking along Punjab borders adds to the problems.

Nepal

Areas of cooperation : 'Surya Kiran' between militaries exercise to enhance cooperation in conducting counter-terrorism operations in mountainous terrain.

Contentions: arrests of some of India's top terrorists along the Indo-Nepal border indicate the vulnerability of the porous border between the two neighbours. 500% increase child and women trafficking from Nepal to India

8. With Industrial revolution 4.0, cyber security becomes sine-quo-non and India has a long road to cover. In this regard, comment on the India's preparation in the area of cyber security. (10 marks; 150 words)

Challenges of to Cyber Security in India:

- ✓ **Vulnerability :** Government is promoting DIP through e-governance, e-Kranti, broadband highways, etc. Internet and Smartphone user base is only set to grow. Banks and other financial institutions are also promoting mobile banking and net banking. These increase the vulnerability to cyber crimes like data theft, espionage, etc.
- ✓ **Growth in online radicalization** is another area of concern.: Cyberspace has no physical boundaries for extremists and terrorists, unlike the traditional warfare. Cyber Terrorism is as big a threat as Cybercrimes.
- ✓ **Understaffing and Overburdened:** Computer Emergency Response Team (CERT-In) are woefully understaffed.
- ✓ **Budapest Convention:** India not a signatory to convention which is the only international

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convention in the field of cybersecurity.

- ✓ **International threats:** It can be of a cyber-war from countries like China and Pakistan.
- ✓ **New age companies:** Start-ups mainly work on the online platform. Hackers are exploiting this opportunity for attacks like Distributed Denial of Service.
- ✓ **Foreign equipment**
- ✓ **Lack of awareness:**

Recent steps taken by the government to resolve the challenges:

- ✓ **National Cyber Security Policy 2013:** It aims at protecting the public and private infrastructure from cyber attacks and build a secure and resilient cyberspace for citizens, business, and government and also to protect anyone from intervening into privacy.
- ✓ Information Technology Act in 2000: It has been amended in 2008 to include electronic transactions, digital signatures, cyber-crimes, cybersecurity and data protection.
- ✓ **National Technical Research Organisation (NTRO):** It has been established in 2004. IT is a technical intelligence agency under the National Security Adviser in the Prime Minister's Office. It also has the responsibility of protecting critical infrastructure institutions and developing offensive capabilities.
- ✓ **National Cyber Coordination Centre** to handle online threats relating to national security.
- ✓ CERTIn is the national nodal agency for responding to cybersecurity incidents as and when they occur.
- ✓ **Information Security Education & Awareness project:** to develop human resource in this field teamed up with countries like USA, UK and China for mutual sharing of information and best practices.
- ✓ **I4C (Indian Cyber Crime Coordination Center)** has been set up in 2016 to look into every kind of cybercrime.
- ✓ Cyber Swachhta Kendra– Botnet Cleaning and Malware Analysis Centre.
- ✓ Computer Emergency Response Team for the Financial Sector (CERT-Fin)
- ✓ RBI directions: RBI has directed banks to implement a security policy containing strategy for dealing with cyber threats.
- ✓ Crisis Management Plan (CMP): Prepared for countering cyber-attacks and cyber terrorism for preventing the large-scale disruption in the functioning of critical information systems of the Government, public and private sector resources and services.
- ✓ Cyber police station

At International Level:

- ✓ **Ground Zero Summit:** largest collaborative platform in Asia for Cybersecurity experts and researchers to address emerging cyber security challenges and demonstrate cutting-edge

technologies.

✓ **Tallinn Manual**

.These measures are right steps in the direction of securing the cyberspace of India. However, these measures are not sufficient enough for the complete defense of India's cyberspace taking in account of the growing internet users and the associated vulnerabilities and the evolving nature of the cyber threats.

Way Forward:

- ✓ **Use of AI and ML:** to predict and accurately identify cyber attacks swiftly could be a real boon for cybersecurity.
- ✓ **Skilling the personnel**
- ✓ **Promotion of R&D** in the cybersecurity arena
- ✓ **Education and Awareness** of the cyber risks both at individual and organizational level can boost the cybersecurity.

9. Discuss, with suitable examples, how space technologies could help in combating internal and external security challenges faced by India. (10 marks; 150 words)

Internal security challenges

- ✓ Weather satellites can provide timely information about topographic features and weather conditions, which are critical to military and para-military operations.
- ✓ Remote sensing satellites can extend the reach of operational forces by providing high resolution images related to earth, which can be used for purpose of detecting factual happenings on ground especially in Left Wing Extremists areas.
- ✓ Radar satellites loaded with synthetic aperture radar (SAR) sensors are capable of providing sophisticated all- time, all-terrain and all-weather intelligence inputs for tracking the movements of drug contrabands, activation of sleeper cells etc.

External security challenges

- ✓ Cartosat satellites can provide scene-specific images and videos with a higher resolution upto few centimeters. This technology notably provided an edge to Indian armed forces in planning recent surgical strikes along Pakistan border.
- ✓ Radar Imaging Satellite(RISAT) series particularly can provide radar images with a resolution of upto one meter of vast and inhospitable land borders with inimical neighbours, thus plugging security vulnerabilities of the country in the maritime zones. RISAT 2 has been particularly used in the aftermath of 2008 Mumbai terrorist attacks for this purpose.
- ✓ Space technological systems can provide Intelligence, Surveillance and Reconnaissance (ISR), Command, Control, Communications, Computers, Intelligence, Information,

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Surveillance, and Reconnaissance (C4I2SR) network, thus enabling an informational advantage, speeding up decisional cycle and greatly enhancing combat potential in international arena.

- ✓ With its growing regional stature and vision of becoming net security provider in Indian Ocean Region (IOR), India is planning GEO Imaging Satellite for acquiring near-real-time images of entire IOR.
- ✓ NaVIC programme consisting of IRNSS would provide Restricted Service (RS), an encrypted service only for authorized users which will help in Terrestrial, Aerial and Marine Navigation up to a great accuracy.

Further following steps can be taken to strengthen security capabilities using space:

- ✓ Devising a comprehensive National Space Policy defining national process for developing and harnessing space capabilities, including coordinated R&D with a special focus on addressing security challenges.
- ✓ Institutionalizing Defence Space Agency for optimizing resource utilisation and acting as a common interface for planning and executing military programmes.
- ✓ Armed forces should evaluate creating a cadre of space professionals, skilled in exploiting space based capabilities in support of diverse operational functions.
- ✓ International collaboration with nations with congruent interests should be enhanced for capability and technology development, sustenance of operations and enhancing collective security capabilities.
- ✓ Adopting the proposed Space Activities Bill, 2017 that will ensure increased participation of private sector in space technologies including those for strengthening security.

10. Critically analyze Defence Procurement Policy 2018 and examine how far it will be able to breed self-reliance of Indian military needs. (10 marks; 150 words)

The **Defence Production Policy 2018** promulgated by the Government, aims at achieving substantive self-reliance in the design, development and production of equipment, weapon systems, platforms required for defence in as early a time frame possible, creating conditions conducive for private industry to play an active role in this endeavour and enhancing potential of SMEs in indigenisation and broadening the defence research and development base of the country.

Features of Defence Production Policy 2018 :

- ✓ **FDI cap increased:** in niche technology areas to 74% under the automatic route - to boost local manufacturing and catapult India into the league of countries with top defence and aerospace industries.

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- ✓ **Simplify taxes:** Rationalisation of taxes on import of capital goods for services and inputs for defence and aims to prevent inversion of taxes.
- ✓ **Indigenous Defence production:** target is 2025 for becoming self-reliant in 13 weapons platforms.
- ✓ **Higher productivity:** India hopes to achieve a turnover of Rs 1.7 trillion in defence goods and services by 2025.
- ✓ **Bigger arms exporter:** arms exporter to the tune of Rs 35,000 crore in defence goods and services by 2025.
- ✓ **Latest technologies:** a global leader in cyberspace and AI technologies.
- ✓ **Skill Development:** advancing and boosting existing PSUs defence production units.
- ✓ **Enabling environment:** The government will list its requirements in terms of platforms and weapon systems for the next decade to help private sector companies understand the opportunities.
- ✓ **Simplify procedures:** It will be easier for private firms to enter defence production, i.e., liberalize the regime by issuing licences in 30 days and pruning no-go areas to a small 'negative list' for licensing.
- ✓ **Ombudsman:** Setting up an ombudsman for resolving offset claims. Here, offsets are investments through a local partner to set up an ecosystem of suppliers—would be investment linked.

But following challenges must be overcome for better results than previous DPP:

- ✓ **Bureaucratic Hurdles/Red-Tapism:** The policy involves multiple ministries which could delay the establishment of defence production ecosystem within an optimistic time frame.
- ✓ **Mere New Packaging:** The policy does not identify any specific new projects by name that would have given industry an indication of the likely business prospects. Without such an indication, the draft policy suffers from the same uncertainty that the previous policy faced.
- ✓ **Reconciliation of Interests:** It would be difficult to reconcile the divergent interests of various stakeholders such as DRDO , Department of Defence Production (DDP) and the Acquisition wing of MoD. The draft DPrP does not, however, provide a concrete solution beyond some cursory remarks that other stakeholders will play their due role.
- ✓ **Trust Deficit**
- ✓ **Inefficiency and accountability Issues**
- ✓ **Funding Constraints:**

However, the Defence Production policy is a step in the right direction. Through it, the government is targeting achieving self-reliance in the development and manufacture of fighter aircraft, medium-

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lift and utility helicopters, warships, land combat vehicles, etc. which will be critical to securing India's national interests.

11. Groundwater Contamination has emerged as one of the biggest threats to health across India. In this regard discuss the reasons for this rise in ground water contamination. Also, suggest remedies to mitigate this problem. (15 marks; 250 words)

Groundwater contamination & dangers on health:

- ✓ Drinking contaminated groundwater can have serious health effects.
- ✓ Diseases such as hepatitis and dysentery may be caused by contamination from septic tank waste.
- ✓ Poisoning may be caused by toxins that have leached into well water supplies.
- ✓ Wildlife can also be harmed by contaminated groundwater.
- ✓ Other long term effects such as certain types of cancer may also result from exposure to polluted water.

Sources of ground water pollution:

- ✓ Most concern over groundwater contamination has centered on pollution associated with human activities.
- ✓ Human groundwater contamination can be related to waste disposal (private sewage disposal systems, land disposal of solid waste, municipal wastewater, wastewater impoundments, land spreading of sludge, brine disposal from the petroleum industry, mine wastes, deep-well disposal of liquid wastes, animal feedlot wastes,
- ✓ Pesticides, fertilizers, herbicides and animal waste are agricultural sources of groundwater contamination
- ✓ Manufacturing and service industries have high demands for cooling water, processing water and water for cleaning purposes.
- ✓ Groundwater pollution occurs when used water is returned to the hydrological cycle.
- ✓ Residential wastewater systems can be a source of many categories of contaminants, including bacteria, viruses, nitrates from human waste, and organic compounds

Other sources of ground water pollution:

- ✓ **Storage Tanks:** May contain gasoline, oil, chemicals, or other types of liquids and they can either be above or below ground.
- ✓ **Septic Systems:** Onsite wastewater disposal systems used by homes, offices or other buildings that are not connected to a city sewer system.

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- ✓ **Uncontrolled Hazardous Waste:** Hazardous waste sites can lead to groundwater contamination if there are barrels or other containers lying around that are full of hazardous materials.
- ✓ **Landfills:** Landfills are the places that our garbage is taken to be buried. Landfills are supposed to have a protective bottom layer to prevent contaminants from getting into the water.
- ✓ **Chemicals and Road Salts:** The widespread use of chemicals and road salts is another source of potential groundwater contamination. Chemicals include products used on lawns and farm fields to kill weeds and insects and to fertilize plants, and other products used in homes and businesses.
- ✓ **Atmospheric Contaminants:** Since groundwater is part of the hydrologic cycle, contaminants in other parts of the cycle, such as the atmosphere or bodies of surface water, can eventually be transferred into our groundwater supplies.

Prevention:

- ✓ Locating on-site sanitation systems: On-site sanitation systems can be designed in such a way that groundwater pollution from these sanitation systems is prevented from occurring.
- ✓ The following criteria have been proposed for safe siting (i.e. deciding on the location) of on-site sanitation systems:
 - a) Horizontal distance between the drinking water source and the sanitation system.
 - b) Guideline values for horizontal separation distances between on-site sanitation systems and water sources vary widely (e.g. 15 to 100 m horizontal distance between pit latrine and groundwater wells).
 - c) Vertical distance between drinking water well and sanitation system.
 - d) Aquifer type.
 - e) Groundwater flow direction.
 - f) Impermeable layers.

The government initiated the Groundwater (Sustainable Management) Bill, 2017, which is based on present understanding of groundwater and its links with surface water and on the legal framework as it has evolved since the 19th century

- ✓ The bill proposes a different regulatory framework from the century-old, outdated, inequitable and environmentally unfriendly legal regime in place.
- ✓ It is based on the recognition of the unitary nature of water, the need for decentralized control over groundwater and the necessity to protect it at aquifer level.

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- ✓ The bill is also based on legal developments that have taken place in the past few decades. This includes the recognition that water is a public trust, recognition of the fundamental right to water and the introduction of protection principles, including the precautionary principle, that are presently absent from water legislation.
- ✓ The bill also builds on the decentralization mandate that is already enshrined in general legislation but has not been implemented effectively as far as groundwater is concerned and seeks to give regulatory control over groundwater to local users.
- ✓ The proposed new regime will benefit the resource, for instance through the introduction of groundwater security plans, and will benefit the overwhelming majority of people through local decision-making.

Solutions:

- ✓ A new regulatory regime for the source of water that provides domestic water to around four-fifths of the population and the overwhelming majority of irrigation is urgently needed.
- ✓ In many place, the situation is now so grave that regulatory action is unavoidable.
- ✓ Environmental Awareness Programs including groundwater prevention should be implemented for community.
- ✓ Innovative technologies are available for the groundwater remediation, for several common contaminants including EDC and Other Chlorinated Compounds, MTBE, and Ammonia. These technologies can be adopted.
- ✓ Minimize use of house hold chemicals containing hazardous substances
- ✓ Avoid draining chemicals, motor oil, insecticides in community areas
- ✓ Reduce pesticide application

Groundwater is one of our most important sources of water for irrigation. Groundwater contamination is a serious problem. Water scarcity puts lives at risk. In addition, many industries rely on water as a resource, which means water contamination threatens their supply chains. Governments, business and communities should all take necessary action to protect this valuable resource.

12. Examine the significance of the recently signed Kigali agreement as amendment to Montreal Protocol and limiting the emission of hydro-fluoro-carbons (HFCs) that contribute to global warming (15 marks; 250 words)

HFCs are a family of GHGs that are largely used in refrigerants in home, car air-conditioners and air sprays etc.

These factory-made gases had replaced CFCs under the 1987 Montreal Protocol to protect Earth's fragile protective Ozone layer and heal the ozone hole over the Antarctica.

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Harmfulness of HFCs:-

- ✓ Recently recent times, it was found that HFCs have several 1000 times capacity in retaining heat in the atmosphere compared to carbon dioxide (CO₂), a potent GHG.
- ✓ HFCs have helped ozone layer but exacerbated global warming.
- ✓ HFCs are currently world's fastest GHGs & emissions increasing by upto 10% each year.

Kigali agreement is an **amendment to Montreal Protocol &** aims to phase out **Hydro fluorocarbons (HFCs)**, a family of potent greenhouse gases by the late **2040s**.

Under Kigali Amendment, in all 197 countries, including India have agreed to a timeline to reduce the use of HFCs by roughly 85% of their baselines by 2045. The Kigali Agreement or amended Montreal Protocol for HFCs reduction will be binding on countries from 2019 & this is expected to arrest the global average temperature rise up to 0.5 degrees C by 2100.

- ✓ It also has provisions for penalties for non-compliance. Under it, developed countries will also provide enhanced funding support estimated at billions of dollars globally.

Significance of the Kigali Amendment:-

- ✓ Kigali Amendment amends the 1987 Montreal Protocol that was designed to close growing ozone hole by banning ozone-depleting coolants like chlorofluorocarbons (CFCs).
- ✓ Thus, amended Montreal Protocol which was initially conceived only to plug gases that were destroying the ozone layer now includes HFCs responsible for global warming.
- ✓ This move will help to prevent a potential 0.5 °C rise in global temperature by the end of the century.
- ✓ The Paris agreement which will come into force by 2020 is not legally binding on countries to cut their emissions. Unlike Paris agreement, it gives clear, concrete and mandatory targets with fixed timelines to the signatory parties to achieve their targets.
- ✓ It would prevent the emission of HFCs equivalent to 70 billion tons of CO₂.
- ✓ Kigali Amendment is considered absolutely vital for reaching the Paris Agreement target of keeping global temperature rise to below 2 oC compared to preindustrial times.
- ✓ It will come into effect from 1st January 2019 provided it is ratified by at least 20 member parties by then.
- ✓ It also has a provision for a multilateral fund for developing countries for adaptation and mitigation.
- ✓ The Technology and Energy Assessment Panel (TEAP) will take a periodic review of the alternative technologies and products for their energy efficiency and safety standards.

Indian Perspective to Kigali Agreement:

1. One of the questions before India in its implementation of Montreal Protocol commitments

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is the need to align its goals for '**Make in India**' with **green technologies** in order to remain competitive in global markets.

2. With Developed nations agreeing to cut 70 per cent of their HFC use by 2029, India will start reducing its HFC consumption when the developed countries would have reduced their consumption by 70 per cent.

3. The Agreement upholds the principle of Common but Differentiated Responsibilities and Respective Capabilities, which means the agreement recognizes the development imperatives of high growth economies like India, and provides a realistic and viable roadmap for its implementation.

4. India a responsible nation: It has announced that it will eliminate the use of HFC-23, a greenhouse gas that harms the ozone layer, by 2030. The elimination will potentially check emissions of HFC-23 equivalent to 100 million tonnes of CO₂ over the next 15 years. (HFC-23 is a by-product of HCFC-22 (Hydrochlorofluorocarbon-22), which is used in industrial refrigeration. It is a potent greenhouse gas (GHG) with global warming potential of 14,800 times more than that of CO₂.)

However, Indian companies will not be compensated for the costs involved in ensuring that these gases are not released. This move is considered as a major break away from the concept of financial assistance for every action on environment in which India earlier had shown the lead.

5. Financial implications: Industries have to either invest in R & D to find out the substitutes for HFCs or they have to buy patented substances and technologies from other MNCs. Consequently, the cost of production will increase which may ultimately shrink the buyer base for their products.

6. Technological implications: Some of the developed nations have already started using substitutes of HFCs in their products and have a sound technological knowledge about their use. Without technology transfer or research, it would be difficult for domestic industries to compete with them in global as well as domestic market.

13. The Ganga river system is very significant and Namami Ganga Mission aims for Ganga Rejuvenation. Critically examine the Mission and give measures to make it result oriented.

(15 marks; 250 words)

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The Ganges has held significant importance since early ages. These significance can be seen in Religious, Economic (irrigation, industry, fisheries), tourism, biodiversity etc.

However, rapidly increasing population, rising standards of living and exponential growth of industrialization and urbanization have exposed the river to various forms of degradation. In this regard, the Namami Ganga Yojana has come up to improve the dilapidated condition of the Ganges.

The **Namami Ganga Yojana** is an ambitious project which integrates the efforts to clean and protect the Ganga river in a comprehensive manner. It aims at Ganga Rejuvenation by combining the existing ongoing efforts and planning under it to create a concrete action plan for future.

Key Features:

- a. An Integrated Effort:** It is an Integrated Ganga Conservation Mission in the sense that it tries to integrate the efforts to clean and protect the Ganga River in a comprehensive manner and will result in socio-economic benefits in terms of job creation, improved livelihoods and health benefits to the vast population that is dependent on the river.
- b. Prime Focus:** Its focus is on pollution abatement interventions namely Interception, diversion and treatment of wastewater flowing through the open drains through bio-remediation or appropriate in-situ treatment or use of innovative technologies such as sewage treatment plants (STPs) or effluent treatment plant (ETPs).
- c. Budget Outlay:** four old increase to 20000 crore rupees for 2015-20.
- d. Sanction by Central Government:** 100 percent funding by centre for various activities or projects under this program and the operation and maintenance of the assets will be for a minimum period of 10 years. It also adopts a **PPP** or **SPV approach** for pollution hotspots.
- e. A three-tier Mechanism:** for project monitoring viz., A high level task force chaired by the Union Cabinet Secretary assisted by NMCG at national level, State level committee chaired by Chief Secretary assisted by SPMG at state level and District level committee chaired by DM.
- f. Improved Co-ordination among Ministries:** between various Ministries or Agencies of the Union and State governments and will involve the States and grassroots level institutions LSGs and people living on the banks of the river in implementation to attain sustainable results.
- g. Special Task Force:** A 4-battalion Ganga Eco-Task Force, a Territorial Army unit, will be set up to bolster enforcement.

Critical analysis:

- a. Insufficient Funds:** Mismatch between funds allotted and timeframe. For example: to restore the river Rhine, which is half the length, took almost three decades and cost forty-five billion dollars. The budget for Namami Gange is just about three billion dollars over five years.
- b. Tardy pace:** Inefficient and slow pace of utilization of funds.

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c. Data mismatch: Mismatch between daily sewage discharge and proposed STP capacity. Further, there is lack of future-proofing while constructing infrastructure.

d. Lack of accountability: According to documents submitted to the court by the Centre, the number of grossly polluting industries (GPIs) affecting the Ganga was 764 in 1985. In 2017, government officials were still listing the number of GPIs as 764.

Way Forward:

a. Increasing the flow by de-siltation, removing all mid-stream constructions, and halting construction activity along the river's banks.

b. Finding innovative ways to check the growing amount of untreated sewage discharged into the river

c. Fixing the enforcement to stop industries from discharging waste into the river.

d. Close monitoring, focus on minimizing waste generation and disposal of waste in eco- friendly manner

e. publicizing the use of electric crematoria

f. make optimal use of latest geo-spatial technologies to rejuvenate the river.

Cleaning Ganga river has become paramount today as it holds cultural, economic and religious significance. Such steps will ensure this holy river is restored to its former pristine glory.

14. Examine the need to have the new forest policy in India. Give important features of draft National Forest Policy 2018. Also comment on the various concerns raised with respect to the policy. (15 marks; 250 words)

We have been following 1988 forest policy since past 30 years. Several developments have taken place since then giving rise to various issues:

- ✓ Low quality and low productivity of our natural forests
- ✓ Impacts of climate change
- ✓ Human-wildlife conflict
- ✓ Intensifying water crisis
- ✓ Increasing air and water pollution
- ✓ Deteriorating environment

Hence there is a need to revise the National Forest Policy, 1988 in order to integrate the vision of sustainable forest management.

Salient Features of Draft National Forest Policy 2018

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- ✓ Maintaining one-third of the total land area under forest and tree cover. For hilly and mountainous regions it would be two-third of the total area.
- ✓ Institutional framework by providing for setting up of National Board of Forestry (NBF) and State Boards of Forestry (SBF).
- ✓ Productivity of forest plantations will be increased through scientific and technological interventions in order to encourage usage of timber.
- ✓ PPP models will be developed for undertaking afforestation and reforestation.
- ✓ A National Community Forest Management (NCFM) mission will be launched to strengthen participatory forest management.
- ✓ Promotion of trees outside forests and urban greens taken up in “mission mode”.
- ✓ Promote agro-forestry and farm forestry industries that would generate employment and would also be beneficial for conservation.
- ✓ Highlights the need to address forest fires, man-animal conflicts and also introduces the concept of forest certification.

However, experts have raised certain concerns with this draft policy

- ✓ It doesn't provide clear framework as to how these objectives will be achieved (lack of clear framework was the reason for failure to fulfill the objectives of 1988 Act)
- ✓ There are concerns that involving PPP model for afforestation and reforestation – lead to privatisation of India's forests and its resources.
- ✓ Completely deleted the section on safeguards to be followed for diversion of forest land.
- ✓ It remains vague on the issue of forests rights for forest dwelling communities.
- ✓ It fails to address the degradation of growing stock in the natural forests.

Government should adopt a 'practical approach' and take care of all the above concerns while finalizing the new forest policy so that both environment and economic roles of the forest could be balanced.

15. What are the key guidelines of Environmental Impact Assessment (EIA)? Do you think current framework needs to be revamped to make it more stringent and more effective?

Justify your stand with suitable examples.

(15 marks; 250 words)

EIA is important step towards protection of Environment. Screening, Scoping, Base line Data collection, Impact perdition, Public Hearing, Environment Management plan, Monitoring are the procedure involved in Making EIA.

Industrial projects can have impact on local resources and local culture, people, biodiversity, climate, forest etc. inquiry into such projects for their sustainability will not only go long way to win

confidence of local population but will also come with best possible ways to make the project environmentally safe.

Limitation –

Conflict of interests – funded by private party whose project are in questions

Inadequate in terms of biodiversity and social issues

Inadequate professionals in India

Alternative sites are mostly not even discussed in india

No representation to NGO in review agency

Reports in English – meaningless for locals

Consultation is optional not mandatory – discretion of expert committee

Reforms required –

Active involvement of NGO, civil society at each level of EIA

Integrated approach – social benefits and limitations, health hazards, longterm vs short terms impacts etc should be taken into account

Local language

Full participation of local people at consultative stage

16. The Sendai framework focuses on engendering disaster management. Discuss the need to this. Explain how National Disaster management Plan aims to make disaster management gender sensitive. (15 marks; 250 words)

Need of engendering DM:

- a) vulnerability of women due to physiologically and socio-economic differences
- b) patriarchy and lack of awareness
- c) disaster induced migration – vulnerable – exploitation and abuse
- d) sexual and domestic violence
- e) less chances of getting resources post disaster relief
- f) post disaster stress syndrome - emotional

NDM Plan 2016 and engendering:

- ✓ Identify familiar environments to rehabilitate elderly, women and children
- ✓ Regular counseling to strengthen the mental health of women and children
- ✓ Make women economically self-sufficient
- ✓ Attention to health, nutrition and hygiene in the long-term rehabilitation package.
For women and children

- ✓ Setup atleast one multi-purpose community centre per village
- ✓ Make efforts to build residential female children homes at the block level
- ✓ Promote self-help groups

17. What are the causes of industrial disasters in India? In the light of National Disaster Management guidelines, discuss the measures to mitigate the impacts of industrial disaster? (15 marks; 250 words)

Industrial disaster may result from:

- a) fire
- b) explosion and toxic release
- c) poisoning
- d) combination of above

Causes of industrial disaster:

- a) **Organizational error** – unsafe working conditions and poor emergency planning and co-ordination.
- b) **Human error** – neglecting safety measures and do's and don'ts.
- c) **Technical** – design fault, corrosion, ageing machines
- d) **Absence of emergency warning procedures.**

NDMA guidelines for industrial disasters:

- ✓ Guidelines for regulatory framework
- ✓ Guidelines for installation and storages
- ✓ Guidelines during transportation of hazardous chemicals

These guidelines calls for a **proactive, participatory, multi-disciplinary and multi –sectoral** approach towards industrial disaster management.

Each stakeholder – public, private, regulatory body and government – have a role to play.

18. 10 years post 26/11 many steps have been taken for better coastal security management. How far do you think Indian coasts are secured from invasion today? Examine while taking into account the role of coastal guards and Indian Navy in coastal security. (15 marks; 250 words)

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Due to the coordinated efforts of all concerned, all these measures are now in place and overall maritime security is much stronger than before. The Indian Navy has been the lead agency in this regard and is assisted in this task by the Indian Coast Guard, Marine Police and other Central and state agencies.

As the lead agency, the Indian Navy handles the task of protecting the outermost tier. To enhance this first line of defence, Sagar Prahari Bal (Ocean Sentinels) has been established and equipped with high-speed intercept vehicles, helicopters and UAVs.

The intermediate layer (extending up to the 12 nautical mile limit of the territorial waters) has been assigned to the Coast Guard while the innermost tier (coastline and inland waters) is the responsibility of the city's marine police.

- ✓ At the apex level the National Committee for Strengthening Maritime and Coastal Security (NCSMCS), headed by the Cabinet Secretary, coordinates all matters related to Maritime and Coastal Security.
- ✓ Joint Operations Centres (JOCs), set up by the Navy as command and control hubs for coastal security at Mumbai, Visakhapatnam, Kochi and Port Blair.
- ✓ Coastal patrolling by Navy, Coast Guard and marine police has increased sharply. At any given time, the entire west coast is under continuous surveillance by ships and aircraft of Navy and Coast Guard.
- ✓ Inter-agency coordination, between nearly 15 national and state agencies has improved dramatically, only due to regular "exercises" conducted by the Navy in all the coastal states.
- ✓ modern technical measures by way of a chain of 74 Automatic Identification System (AIS) receivers, for gapless cover along the entire coast. This is complemented by a chain of overlapping 46 coastal radars in the coastal areas of our mainland and Islands. A second phase of coastal radars is also being implemented to plug the small gaps in some places.
- ✓ As part of the effort to enhance our Maritime Domain Awareness, National Command Control Communication and Intelligence Network (NC3I) as over-arching coastal security network collates data about all ships, dhows, fishing boats and all other vessels operating near our coast, from multiple technical sources including the AIS and radar chain.
- ✓ Issue of ID cards to all fishermen with a single centralised database, registration of over 2 lakh fishing vessels operating off our coast and equipping fishing boats with suitable equipment, to facilitate vessel identification and tracking are some of the other steps taken.
- ✓ The Navy and Coast Guard have also provided periodic maritime training to marine police in all coastal states.

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- ✓ The bi-annual Sagar Kavach exercises— involving the Indian Navy, ICG and the coastal police — illustrate a spirit of teamwork in the littoral domain, indicating a willingness to jointly tackle maritime threats.
- ✓ recently India got its first state-of-the-art harbour defence systems. With a multitude of coastal surveillance radars, high-power underwater sensors and diver detection sonars, these systems are capable of detecting, identifying, tracking and generating a warning for both surface and under water threats.

Among a range of glaring lacunae, the greatest is the absence of a comprehensive system for identifying all vessels in Indian waters. The AIS is only effective if every such vessel is fitted with a transponder.

As revealed by CAG audit reports, under-utilisation of acquired equipment, delays in creation of shore-based infrastructure, human resources shortages, unspent funds and red-tapism continue to plague the state of coastal policing along India's long shoreline.

At present, a notification has been issued for all vessels above 20 metres to be fitted with transponders, and has been partially implemented. There is no provision for vessels below this length — which constitute a majority of all boats in coastal waters at any point of time, and would be the likely transport to be used by terrorists.

Moreover, the Coastal Security Bill to form a National Maritime Authority (NMA) is still mired in red tape — the National Committee for Strengthening Maritime and Coastal Security (NCSMCS) is at best an ad-hoc arrangement.

19. There have been instances of economic crimes and this is undermining India's as investment destination. Elucidate the challenges and strategies to curb the menace of economic frauds in India. (15 marks; 250 words)

Recent cases of fraud done by Vijay Mallya of 9000 cr, PNB fraud of 12,800 cr by diamond merchant Nirav Modi and the cases of money laundering has lessened the trust of foreign investors in India' market and thus undermine the India's efforts to attract FDI (Foreign Direct Investment) and its ease of doing business.

Challenges

- ✓ Nexus between government officials, politicians, influential business groups
- ✓ Lack of autonomy to investing agencies eg: CBI,ED,CVC etc as they are under of central govt
- ✓ Lack of coordination among various investigating agencies accompanied by their overlapping functions eg : CBI,ED performs similar functions in money laundering case
- ✓ Threat to life of investigating officers which acts as a demotivating factor to bring such crimes into

limelight due to weak whistle blowers act.

- ✓ Delayed judicial process along with money and muscle power also acts as hindrance
- ✓ Prevention of Corruption Act 1988 is of pre-liberalization era which doesn't include some contemporary crimes.
- ✓ Lack of efficiency in government institutions which work against illegal tasks against financial shortcomings.
- ✓ Interdependence of government institutions causing delay in investigation and justice delivery.
- ✓ There is dearth of expert trained manpower in banks because generalists are recruited and no incentive for excellence.
- ✓ Lack of proper information sharing mechanism.

Strategies to curb the menace

- ✓ Strict enforcement of various acts such Cyber Crime Act, Money laundering Act, Whistleblower Act, Prevention of Corruption Act, Fugitive Economic Offender Act and so on.
- ✓ There should have a mechanism to review our laws periodically and in line with global standards.
- ✓ Establishment of institutions which imparts the forensic investigation skill.
- ✓ Vigilance culture and internal accountability mechanism of the institutions must be strengthened and checked intermittently
- ✓ CBI's 'Economic Intelligence Wing' - dedicated to deal with economic crimes should be promoted.
- ✓ There should be increased use of data and big data analysis to provide justice.
- ✓ Capacity building of various institutions investigating crime such as ED, CBI, CVC etc
- ✓ A multi-agency cooperation & partnership - immediate investigation for faster justice.
- ✓ There should be enhanced professional standards and ethics.
- ✓ Fast track courts needs to be established for faster disposal of cases
- ✓ Collaboration with countries for faster extradition for those shifted abroad to evade punishment.
- ✓ Transparent & accountable system of administration by using IT, AI etc
- ✓ Rewards for honest and daring officials for bringing crimes into limelight.

20. Left Wing Extremism (LWE), once considered to be the biggest internal security challenge, is now in its last leg. Taking into account the effectiveness of the

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various steps taken by government to fight LWE in Indian Red Corridor, critically examine the statement. (15 marks; 250 words)

Facts showing LWE is on its last leg:

- ✓ Number of violent incidents of LWE has drastically reduced from 1048 in 2016 to 908 in 2017.
- ✓ Related deaths have seen a 34% decline in 2017 as compared to 2013.
- ✓ .Compared to 2013, surrenders by LWE cadres have increased by 411 percent in 2016.
- ✓ 43% reduction in casualties to Security Forces personnel.
- ✓ Reduction in **geographical expanse** : MHA has also recently redraw the Red Corridor by bringing down the number of districts affected with Naxal violence from 106 to 90, spread across 11 states

Efforts of the government in this regard:



Both central government and state governments adopted **dual** pronged strategy-

- ✓ “Bullet for Bullet strategy” and
- ✓ “Intervention through socio-economic development”

Security related measures:

- ✓ Security Related Expenditure (SRE) Scheme
- ✓ Black Panther combat force for Chhattisgarh, Greyhounds unit in Telangana & Andhra.

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- ✓ Bastariya Battalion – A newly formed battalion of CRPF with tribal youth from four highly naxal infested districts of Chhattisgarh along with adequate female representation
- ✓ Creation of a separate vertical in the NIA for investigating important cases relating to LWE.
- ✓ To check funding of Naxallites Multi-disciplinary groups with officers from central agencies, including from the IB, NIA, CBI, ED and DRI, and state police has been formed.

Socio economic development initiatives

Infrastructure:

- ✓ Road Requirement Plan-I (RRP-I)
- ✓ LWE Mobile Tower Project

Skill Development:

- ✓ ROSHNI is a special initiative under Pandit Deen Dayal Upadhyaya Grameen Kaushalya Yojana.
- ✓ Skill Development in 34 Districts affected by LWE to establish ITIs and Skill Development Centres
- ✓ Constructively engaging youth through education

However there are certain issues still persisting like

- ✓ Negligence of established **standard operating procedures** for example – Sukma attack
- ✓ Vulnerabilities remain such as poor planning, inadequate numbers, insufficient intelligence backup etc.
- ✓ Structural deficits and deficiencies such as putting IPS deputies into almost every senior position in CRPF ignoring the decades of experience within the Force.
- ✓ Inefficient technology of **mine detection**

Way Forward:

- ✓ Strengthen intelligence and ground presence
 - ✓ Eliminate alienation of tribals.
 - ✓ Centre-state cooperation
 - ✓ Technological solutions: micro or mini-UAVs or small drones
 - ✓ Govt should build trust by joining hands with civil society
 - ✓ Awareness generation
 - ✓ Monitor the implementation of constitutional and statutory safeguards, development schemes and land reforms initiatives for containing discontent among sections vulnerable to the propaganda of violent left LWE.
- ✓ Choke funding