CSE MAINS TEST SERIES-2019

Test CT1909 Synopsis

1. **In light of the PepsiCo suit, discuss whether the entitlements under Protection of Plant Varieties and Farmer's Rights Act, 2001 amounts to intellectual property rights (IPR)? Comment on the 'farmer-privilege' clause in this regard.**

PepsiCO has filed a law suit against **Gujarat potato farmers** since the crop variety grown by them is registered by the company under PPVFR Act. It claims that farmers have violated its EXCLUSIVE right to plant the crop.

ENTITEMENTS

1. **Farmer rights—**the Act gives the farmers following entitlements:
    - A farmer who has evolved or developed a new variety is **entitled for registration and protection** in like manner as a breeder of a variety
    - Farmers variety can also be registered as an **extant variety**
    - A farmer ***can save, use, sow, re-sow, exchange, share or sell*** his farm produce including seed of a variety protected under the PPV&FR Act, 2001 in the same manner as he was entitled before the coming into force of this Act provided farmer shall not be entitled to sell branded seed of a variety protected under the PPV&FR Act, 2001;
    - Farmers are eligible for **recognition and rewards** for the conservation of Plant Genetic Resources of land races and wild relatives of economic plants;
    - There is also a provision for compensation to the farmers for non-performance of variety under Section 39 (2) of the Act, 2001 and
    - Farmer shall not be liable to pay any fee in any proceeding before the Authority or Registrar or the Tribunal or the High Court under the Act.
2. **Researcher rights—**Researcher can use any of the registered variety under the Act for conducting **experiment** or research. This includes the use of a variety as an initial source of variety for the purpose of developing another variety but repeated use needs prior permission of the registered breeder.
3. **Breeder rights**— Breeders will have exclusive rights to produce, sell, market, distribute, import or export the protected variety. Breeder can appoint agent or licensee and may exercise for **civil remedy** in case of infringement of rights.

The above rights point towards the fact that the invention of any inventor is secured as a right to own it and right against its use by others. In this manner the protection to plant variety is a security to inventions.

But **TRIPS Agreement of WTO, 1994** claims plant varieties need not be brought under patent laws, so they treat plant variety invention not at par with IPR so the protection to such inventions are legally sought to be no very robust.

FARMER PRIVILEGE CLAUSE—In India IPRs are not allowed for commercial exploitation. Social interest receives primacy as in generic medicines.

Under PPVFR Act Farmers who have purchased a registered variety by a company can save the seeds from the first crop and use it further:

- They can **save** and conserve the seed
- They can do **vegetative propagation** of that seed
- They can also **share or sell** the seed to other farmers.

This privilege to farmers to attain sovereignty over a protected variety developed by a company is called farmer's privilege. This is encouraged by TRIPS Agreement considering the vulnerability of farmers.

If such clause does not exist, **MNCs** will attain monopoly and exploit farmers.

This is to secure farmer interest, but corporate-kind of utilisation in name of farmer is not allowed. So, corporates cannot have privilege to sell other company's registered variety. This way, innovation is secured and encouraged. Knowing this and after public outrage against PepsiCO for being uncompassionate to farmers it withdrawn its suit. So, *plant varieties are not legally IPRs but by giving protection to breeder companies against free-use by another company* competition and inventions are encouraged.

2. **Analyse the causes and effects of anti-microbial resistance on human and ecological health. Discuss the approach of Indian government and WHO to deal this crisis.**

Antimicrobial resistance is the capacity of a pathogenic microbe to **resist therapeutic capacity** of a drug and successfully affect health of the patient or its host. This is due to DNA changes in the microbe like bacteria.

CAUSES:

1. **Bacteria attains resistance because:**
   a. Some bacteria due to the presence of resistance genes are intrinsically resistant and therefore survive on being exposed to antibiotics. They become resistant to even third-line of drugs called **superbugs**
   b. Once the resistance has been acquired, it can spread in the rest of the population of bacteria through reproduction or **gene transfer**. **MCR-1** is such a gene discovered recently which when transferred to other microbe it will get resistance to antibiotics.

2. **AMR spreads because of:**
   a. **Unnecessary and injudicious use of antibiotic** fixed dose combinations could lead to emergence of bacterial strains resistant to multiple antibiotics.
   b. **Social factors** like:
      - Self-medication
      - Painkiller culture in poor families to save cost
      - Over-the-counter sale of unprescribed medicines by pharmacies
   c. Cultural causes like **mass religious bathing**
   d. **Livestock (poultry) and plants** are grown with antibiotics to improve yield

e. The **wastewater effluents** from the antibiotic manufacturing units contain a substantial amount of antibiotics, leading to contamination of rivers and lakes.
f. **Lack of hygiene in hospitals**— a report on hand-washing practices of nurses and doctors found that only **31.8%** of them washed hands after contact with patients.

EFFECTS:

a. A **threat to prevention and treatment of infections** - medical procedures such as organ transplantation, cancer chemotherapy, diabetes management and major surgery (for example, caesarean sections or hip replacements) become very **risky**.
Decrease in recovery efficiency of patient especially TB, AIDS, etc.,

g. Antimicrobial resistance **increases the cost of health care** with lengthier stays in hospitals, additional tests and use of more expensive drugs. This may impoverish families.
h. Without effective antibiotics for prevention and treatment of infections, the **achievements of modern medicine** are put at a risk.
i. Disease spread to plants and animals and **loss of biodiversity**

MEASURES:

1. **BY INDIA:**
India has been called the epicentre of the global drug resistance crisis. A gene called New Delhi Metallo-beta-lactamase 1 (NDM-1), which makes bugs resistant to **carbapenem** antibiotics has been identified from India.
   - In 2012, India's medical societies adopted the **Chennai Declaration**, a set of national recommendations to promote antibiotic stewardship.
   - India's **Red Line campaign** demands that prescription-only antibiotics be marked with a red line, to discourage the over-the-counter sale of antibiotics.
   - National Policy for Containment of Antimicrobial Resistance 2011.
   - **National Action Plan** on AMR resistance 2017-2021
   - Since March 2014 a separate **Schedule H-1** has been incorporated in Drug and Cosmetic rules to regulate the sale of antimicrobials in the country.
   - The Food Safety and Standards Authority of India (FSSAI) banned the use of antibiotics and several pharmacologically active substances in fisheries.
   - The government has also capped the maximum levels of drugs that can be used for growth promotion in meat and meat products.
   - In July 2019, Government banned **colistin** use in chicken industry which is an antibiotic
2. **WHO**
   - **"Global Action plan on Antimicrobial Resistance"** has 5 strategic objectives:
     - To improve awareness and understanding of antimicrobial resistance.
     - To strengthen surveillance and research.
     - To reduce the incidence of infection.

- To optimize the use of antimicrobial medicines.
- To ensure sustainable investment in countering antimicrobial resistance.

- World Antibiotic Awareness **Week** has been initiated
- The **Global Antimicrobial Resistance Surveillance System (GLASS)**— supports a standardized approach to the collection, analysis and sharing of **data** related to antimicrobial resistance
- **Global Antibiotic Research and Development Partnership (GARDP**)— A joint initiative of WHO and Drugs for Neglected Diseases initiative (DNDi), GARDP encourages **research** and development through public-private partnerships
- WHO gave the One Health Approach through mutual transfer of anti-biotic resistance between humans versus animals and foods can be tackled with integrated efforts.

Estimate tells that antibiotic resistance will be responsible for **10 million deaths** annually by 2050. Its economic cost will result in a 2 to 3.5-per cent **decrease in global GDP** to same year, so it is viewed as a global pandemic nowadays.

3. Despite repeated efforts India is unable to rescue her cities from severe air pollution. Why? Mention two air quality monitoring systems established by India.

World Air Quality Report 2018 tells that **14 of the 15 worst air polluted** cities are in India and it has increased premature death e.g. Delhi, especially the children and elderly.

Successive government at both state and centre have taken efforts to abate air pollution and despite court declared **Right to Clean Air and Environment** as a fundamental right, much has not changed.

REASONS BEHIND REPEATED FAILURE:

A. Untamed agricultural practice:

a. No counter-measure to stubble burning until recently e.g. Punjab crop burning

B. Policy gaps:

b. Vehicular emissions continuing,
   - Ad-hoc response like odd even policy of Delhi
   - Natural gas pipelines are unevenly placed
   - Permanent measures like electric vehicles are underway and in slow pace.

c. Construction activity increases dust and watering it gives temporary results

d. Air monitoring initiatives are
   - Not available for all cities
   - Not covering all pollutants
   - Suffering from huge error in air quality estimates (10-26%)

C. Dependence on fossil fuels— Industries are using coal yet and our reliance on it has not reduced—no strict standards and rules on exhaust filters.

80% of India's electricity is generated from fossil fuels owing to supply and demand issues in renewable sector.

D. **Curse of nature—**Natural reasons like **temperature inversion** is intensifying pollution despite our efforts

E. **Lack of technology**—Need investment in **air purifiers** like China, because some dust is beyond private sector's control so government should come

SUGGESTIONS:

1. Subsidies e-vehicles especially public transport
2. Use eco-friendly construction material
3. Ban diesel vehicle in all cities
4. Urban afforestation

TWO MONTIORING SYSTEMS:

a. Four pollutants (SOx, NOx and two types of PM) are monitored under **National Air Monitoring Programme** with help of 346 stations in 130 cities. The objectives are to determine:
   - Status and trends of ambient air quality
   - To ascertain whether prescribed standards are violated
   - To understand the natural cleansing process like pollution dilution, dispersion, wind-based movement, dry deposition and precipitation.

b. **National Air Quality Index** based on 'One Number- One Colour-One Description' approach for the common man to judge the air quality within his vicinity was launched in 2014.

Air monitoring suffers from inconsistent power supply and voltage fluctuation while monitoring, sampling techniques are not robust so there is **error of 10 to 26%** in our Air Quality estimates.

National Clean Air Programme has been initiated to roll out a national level plan so that the sporadic and ad-hoc responses are now replaced with a centrally-drive mission mode approach to abate air pollution.

4. **Describe the commitments undertaken in United Nations Convention to Combat Desertification (UNCCD) and comment on the idea of 'Land Degradation Neutrality (LDN)' recently adopted under it.**

UNCCD is one of the few rules adopted under **Rio Summit or Earth Summit of 1992** and it legally binding. Land degradations extinct civilisations e.g. Indus Valley

COMMITEMNETS:

Members of UNCCD commit to,

1. to improve the living conditions for **people in dry lands**
2. to maintain and restore land and soil **productivity**

3. to mitigate the effects of **drought**
4. A bottom-up approach, encouraging the **participation of local people** in combating desertification and land degradation.
5. facilitates **cooperation between developed and developing countries**, particularly around knowledge and technology transfer for sustainable land management.
6. As the dynamics of land, climate and biodiversity are intimately connected, the UNCCD **collaborates closely with the other two Rio Conventions**— the Convention on Biological Diversity (CBD) and the United Nations Framework Convention on Climate Change (UNFCCC)

To discharge these commitments,

- **Conference of Parties** to the UNCCD takes place frequently to promote international cooperation
- **Committee on Science and Technology** is set up to foster research

LAND DEGRADIIN NEUTRALITY:

Meeting at Ordos, China, the UNCCD adopted the goal of LDN. It is defined by the parties to convention as a "*A state whereby the amount and quality of land resources, necessary to support ecosystem functions and services and enhance food security, remains stable or increases within specified temporal and spatial scales and ecosystem"*

It is inspired from the counter-desertification in **Loess Plateau** of China. The strategies under LDN are:

i. Conserving soil **moisture**—e.g. mulching
ii. **Community participation**—e.g. Soil preservation volunteers and bottom-up approaches as seen in Soil Health Card scheme of India.
iii. Special focus on inclusion of **women** in rural areas
iv. **Afforestation** of the degraded lands
v. Preventing **run-off** e.g. use contour bunds
vi. **Organic farming** to promote soil health and integrity and sustainable relations between land and man.

By achieving LDN it is believed that the contribution to climate change from land resource (retaining soil carbon) is reduced and sustainable livelihood systems are created—poverty alleviation and prosperity from lands.

5. **Explain different types of biomes in India and brief about various protected areas intended to conserve them.**

A biome is a community of plants and animals that have common characteristics in an **ecological region** that different from other communities. Differences between biomes are due to **temperature, moisture, light**, etc.

This leads to genetic and species diversity between biomes.

TYPES OF BIOMES:

a. **Evergreen forests**—they are in equatorial or tropical regions—amount of sunshine and so rainfall differs. Equatorial biome is denser and of hardwoods like ebony (but tropical as moderate woods like Teak)
   - This region covers 7% of earth surface, but hosts 40% of the plant and animal species
   - Marked by multi-layered canopy and epiphytes at ground

b. **Deciduous biomes**—in tropical and subtropical regions where due to seasonality of rains we have dry and wet seasons and so fall of leaves
   - Trees like oak, cherry and beech are seen
   - Animals are most familiar vertebrates and invertebrates like snakes, deer, tiger, wild buffalo and monkeys,
   - This biome is most **conducive for human habitation.**

c. **Grasslands—**are of two types i.e. tropical and temperate. **Savannah** in tropical type and American **prairies** in temperate type are familiar. It is conducive for agriculture—wheat granaries of the world in USA.

d. **Deserts**—continental interiors like Gobi Desert or regions of high-pressure belts like Sahara are desert biomes. Drought resistant xerophytes like cactus are seen and snakes and few predator species dominate the region.

e. **Taiga**—here the dominating vegetation is coniferous evergreen like **spruce**, pine and firs.
   Extreme climate and snow fall characterise the identity of this biome. Its soil is acidic. **Siberian tiger** that adopted to cold climate with multi-layer fat is an iconic specie of this biome.

f. **Tundra—**it is seen in northern most region adjoining the ice-bound poles. It is devoid of tress except stunted shrubs

PROTECTED AREAS are of two kinds,

1. **IN-SITU PROTECTION,**

a. **National Parks and wild life sanctuaries** meant to prevent human activities that are unsustainable in a define area (e.g. **Manas NP**). Some animals and trees are exclusively focussed e.g. **Rhino**

b. **Eco Sensitive Zones** established under the Environment Protection Act 1986, are additional layer to NPs and WLS so they act as Cushions for NPs n case of excessive threat e.g. in Kerala **Western Ghats**

c. Biosphere Reserves designed and advocated by UNESCO's Mand and Biosphere Programme, is a larger area in which the human livelihood interest is balance with biome interests e.g. Nilgiris BR

EX-SITU PROTECTION,

d. **Zoos and botanical gardens** are the ex-situ methods i.e. outside natural home. For instance, Lal Bagh Garden or Sri Venkateshwara Zoological Park. They are managed by Central Zoo Authority (CZA).

India has been successful in this with many of its protected areas being part of UNESCO World Heritage Sites (WHS like Kangchenjunga National Park) and changed endearment status of many animals in **IUCN Red list** e.g. snow leopard.

6. **In light of the principles of Sendai Framework (2015-30), evaluate the National Disaster Management Plan, 2016 of India.**
Sendai Framework gives a renewed approach for disaster management under aegis of UN Disaster Body. Its principles include—reducing mortality, morbidity, property loss and increasing resilience by risk reduction.

The **2016 Plan** is the first ever plan for disaster management in India. it is made by keeping in mind the Sendai Framework and SDGs. Its features are:

a. It broadens the meaning of disaster and outlines **15 types of disasters** to include industrial disaster also. Sendai Framework wants COMPREHENSIVE risk reduction by including all the sectors
b. It charts out three level—**short, medium- and long-term plan** for all kinds of disasters
c. **Horizontal and vertical integration** of all authorities with clear roles and responsibilities is a hallmark of this plan,
    - Up to Panchayat level a role-matrix is made
    - Ministries are given specific roles overcoming hitherto ambiguity during crisis management
d. The plan has a **regional approach** for disaster management which will also help development planning. This integration of disaster management and development is another principle of Sendai Framework
e. A **checklist** of activities is prepared and also provides a general framework for recovery management
f. It focuses on the **ethical and responsible conduct of media** in times of disaster in light of criticism about Indian media's conduct during Nepal earthquakes.

So, by broadening the framework and involving the stakeholders the plan is preparing India to meet raising risk because—India is the **second most prone nation** for disasters as per UN estimates.

But it gives **one-size fits all** approach and not recognises the differences between genders and poverty levels in rehabilitation of disasters, nor does it talk about much needed finance.

The first body to respond is **Cabinet Secretariat** which is the crisis manager during disasters whose capacity building has not received attention of government.

Despite all, effort to align the national policy with **Sendai principles** raised the bars in managing disasters which was not up to the mark owing to shortfalls in **Hyogo Framework** which guided our policy till date.

7. The NIA Bill 2019 will make the agency more robust and comprehensive, but apprehensions have been raised about 'state-excesses' which is not new for Indian anti-terror laws. Elaborate.

NIA Bill is intended to make the investigative power of the body more comprehensive so that new dimensions of terrorisms are dealt with, NIA is an investigation mechanism in counter-terror framework of India created after **Mumbai attacks 2008**.

The bill intends to bring three new changes,

i. The first change is the **type of offences** that the NIA can investigate and prosecute. Under the existing Act, the NIA can investigate offences under acts such as the Atomic Energy Act, 1962, and the Unlawful Activities Prevention Act, 1967.

   According to PRS, the latest amendments will enable the NIA to **additionally investigate offences** related to
   - human trafficking,
   - counterfeit currency,
   - manufacture or sale of prohibited arms,
   - cyber-terrorism, and
   - Offences under the Explosive Substances Act, 1908.

ii. The second change pertains to **NIA's jurisdiction**. Presently, for the offences under its purview, NIA officers have the same power as other police officers and these extend across the country, but not outside the country.

   The Bill amends this to give NIA officers the power to investigate **offences committed outside India**. However, NIA's jurisdiction will be subject to international treaties and domestic laws of other countries.

iii. The third change relates to the **special trials courts** for the offences that come under NIA's purview i.e. "scheduled offences".

   The existing Act allows the Centre to constitute special courts for NIA's trials. But the Bill enables the Central government to designate session's courts as special courts for such trials.

State-excess in name of counter-terror operation is an accusation in India from independence. Various acts were made,

i. **Preventive Detention Act 1950** which was accused for misuse to meet political motives has expired in 1969
ii. **MISA Act** i.e. Maintenance of Internal Security Act 1971 alleged for being misused to encounter the increased unrest during emergency period (1975-77) was repealed in 1978

iii. **National Security Act 1980** also permits detention but in recent times it is in bad light for reasons like detention of cow slaughters under it

iv. **AFSPA Act** to deal with "disturbed area"—areas disturbed by violence. It is attributed to the alleged human rights violations by Army men. It is the one law which has sustained public criticism and sustained till date.

Apart from civil society (NGOs—Human Rights Watch), **National Human Rights Commission** has opposed these laws. However, considering the primacy of national security Supreme Court maintained low tone on them.

A balanced approach can be taken—while giving state enough powers, **accountability mechanisms** like tribunals should also be built to reap security and rights at once.

8. Identify various economic frauds that endanger our welfare and growth and evaluate India's response.

Economic frauds dominantly include money laundering and also financial forgeries and corruption by State officials lastly National Institute of Public Finance and Policy (NIPFP) and other public economic institutes estimate the size of black money in India to be 62% to 75% of GDP.

That shows beyond an economy of size 153 lakh crore, there is a shadow economy worth 95 lakh crores. This is not taxed, this affects inflation trends, boosts real estate prices and above all hampers the poverty alleviation efforts, promotes terror financing—thus endangering our economic and national security.

VARIOUS ECONOMIC FRAUDS INCUDE:

a. **Hawala** operations exits from medieval times where illegal money changes hands in such manner that the source is undetectable

b. **Shell companies** where the company is opened not for any commercial activity but only to cleanse the dirty money

Government claims only 66% of Indian companies are active and the rest are suspected to be shell companies.

c. **Base Erosion and Profit Shifting** and use of **tax havens** to divert and cleans the money like those saved by not paying taxes. E.g. *Swiss Banks, Cyprus, Cayman Islands*, etc.,

Black money outside India in such havens is 490 billion USD. Panama Papers put the numbers in further higher margin.

d. **Under-invoicing or over-invoicing** i.e. a cheap goods is valued more so that black money is shown as profit.

This was the chief mode of fraud in Commonwealth Games Scam 2010.

e. **P-Notes (Participatory Notes)** wherein black money of a citizen enters his nation in form of foreign investment done with help of hawala operators.

f. **Fugitive Economic Offenders** who leave the nation by wilfully defaulting the bank loans taken

g. **Counterfeit currency** is traditional mode of economic fraud mostly done by terrorists.

Since high-denomination notes can be easily demonetised, counterfeiters are switching to Rs. 50 notes and as per RBI the number of counterfeit Rs. 50 notes increased by 153% from 2017 to 2018.

RESPONSE:

1. **Double Taxation Avoidance Agreements** are signed
   As of January 2019, India signed DTAA with **88 countries.** This is the only successful instrument and deposits in Swiss Banks has declined rapidly—it fell by 11% in 2018 in comparison with previous year.
2. **Special Committee** under Justice Shah for Black Money actions
3. **Tax Amnesty schemes** to give final chance for tax defaulters eg. Voluntary Disclosure of Income Scheme. Since, government is suspected for punishing after disclosing tax avoidance, the response has been **lukewarm.**
4. RBI ban of **Letter of Undertaking** to prevent international frauds like recent Diamond Merchant case.
5. **Fugitive Economic Offenders Act 2018** to seize the property of economic fugitives. But cooperation by foreign nations is not much encouraging since the **extradition process** is mired with complexities and politics. So, India should update its treaties with such nations especially **UK.**
6. SEBI to discourage **P-Notes** investment mode brought disincentives in 2017 like **USD 1000** as fees for investing. This discouraged P-notes usage heavily,
   Now, p-notes investment is at nine-year low which is a huge success.

Behavioural economics tells that not only disincentives but also incentives like tax reforms will reduce generation of black money which is the lifeblood of many economic frauds.

9. "Instead of strengthening democracy, social networking sites are facilitating mobocracy". Explain in Indian context and show how this can be tackled.

India has second largest users of social media which is considered to deepen democracy by promoting unrestrained free speech, but it has turned into hub for hate speech and propaganda also.

a. **Hate speech**—hatred against particular community is spread in social media this divides communities and makes them angered and antagonistic. When an opportunity comes, it unleashes mob violence.

   E.g. communal violence in **Jharkhand** for a post about **Lord Ram**

b. **Fake news** is spread to create fear and anxiety in people who to protect them as a group deliver justice but without fairness,

   E.g. by misunderstanding some youth as **child abductors**, they got lynched by mob in **Assam**. The false message was spread through WhatsApp

c. **Political parties** during elections use Facebook to drive their emotions and even it leads to murder of opponent parties as seen in the serial **killings of party-men** back to back in **Kerala**.

d. A study proved there is habit of people to get **homogenised** and share a view that has more likes.

   So, a group with particular view will enlarge and it will pit itself against another group. This gathers people undesirably for wrong reasons—they share views about taking revenge, ostracism, etc.,
   E.g. this is the cause behind mob violence in which a **Bulshandar Police Officer** was murdered.

   RESPONSE:

   1. **WhatsApp and Facebook** asked to take counter measure against fake news. The actions taken by WhatsApp includes,
      - Only 5 forward messages allowed per day
      - WhatsApp Media Campaign on handling of fake news
      - Facility to report offensive and abusive messages
      - Checkpoint Tipline facility in which an user can call WhatsApp and ensure whether an information received is verified or not, after data analytics study, WhatsApp will find the veracity of information

   2. **Manipur passed Anti-Mob Violence Law** penalising mob justice and lynching. Now, UP is also taking action to this end.
   3. **Supreme Court** gave **11-point prescription** to deal mob violence including preventive, remedial and punitive steps, e.g. registering FIR against those who spread false messages.
   4. Central Government had set-up two **high level committees** one headed by Home Minister and other by Home Secretary. One of the terms of reference is “amendment to **IPC 1860”**
   5. **MHA Advisory** to states asked them to appoint **nodal-officers** for handling mob lynching
   6. **Internet shutdowns** if any intelligence of mob violence is received.

Mobocracy is threatening rule of law in India which is a sine qua non for national security. Unless we crack them down, they can be misused by fringe elements like insurgents and terrorists. Mobocracy in **Arab Spring** was used in bad way by **ISIS** which should caution us.

10. Clarify the linkages between trafficking and terrorism, discuss laws meant to avert this unholy nexus.

Trafficking is the illegal seizure and abduction of a property or person against their will. It is a source of illegal money making which becomes crucible for terror financing. Trafficking saw a **growth of 16%** in 2016 as per NCRB data.

LINKAGES WITH TERRORISM:

a. **Human trafficking** especially women is highly used as it is source of lumpsum money in one iteration—they are sold as slaves, servants, etc., in Thailand, Saudi. The trade happens through regions who collect tax on trafficking e.g. Afghanistan where Taliban collects taxes and funds itself.

   Unfortunately, **59%** of humans trafficked are **children** who are misused for child pornography among other cruel crimes.

b. **Organ Trafficking** involves illegal stealing and cheating from donor mostly under gunpoint by terrorists as seen in Dandakaranya region amongst elderly who lost many kidneys.
   This funds Naxal terrorism in red corridor of India.
c. **Drug trafficking** from two terror affected regions—Golden Crescent (Afghan), Golden Triangle (Myanmar) ensures the terrorists collect duty or themselves act as **COURIERS** of drug as seen in North East region—entry of drugs. Beneficiaries are **NSCN Naga terrorists**.

LAWS include,

e. Right against trafficking is a **fundamental right** under Article 23 and 24 for all and especially for children
f. **Immoral Traffic (Prevention) Act 1986** which penalises the action
g. **Trafficking of Persons (Prevention, Protection and Rehabiliation) Bill 2018** establishes Anti **Trafficking Bureau** and rehabilitation mechanism for victims. Once, receiving President assent the law will bring immense change in our counter-trafficking strategy.
h. **Narcotic Drugs and Psychotropic Substances Act, 1985** focuses on seizure of drug and even death penalty in special cases and it establishes the powerful **Narcotics Control Bureau.**
i. Also, **Enforcement Directorate** and **NIA** are empowered to take actions and investigate such crimes under acts like **Prevention of Money Laundering Act, 2002** and **NIA Act 2008**

Trafficking promotes bonded labour and violates fundamental rights leading to our poor ranking in **ILO Modern Slavery Estimates.** Trafficking shows the extremism of illegality for money, vulnerable are most affected, with coming of ISIS to South Asia it is high time trafficking is rooted out from our noble land.

11. Define Innovation and mention three goals of Science, Technology and Innovation Policy of 2013. Discuss India's efforts and challenges in making our nation an innovation-led society.

Innovation as per National Innovation Council is defined as the process of converting a new idea into goods or services creates value and has either commercial or social relevance. The latter form is called social entrepreneurship which is in budding stage across world.

GOALS OF STI Policy 2013:

1. Increasing investment in **R&D to 2%** from present 0.7%
2. Involving **private sector** as a strategic partner in promoting STEM skills for innovation
3. Linking and **synchronising** the efforts of *academia, research and industry* to create a seamless network
4. International collaboration for scientific upgradation and technology transfer finally leading to technology indigenisation.

EFFORTS:

A. BRINGING INNOVATION IN EDUCATION:

a. Innovation culture is being built from school level to industry level; under **Atal Innovation Mission**:

- **Atal Tinkering Labs** will be established for exposing students to innovation and new thinking
  These labs will have 3D printers, robotics, IoTs, etc.

Around 2000 schools have ATLs and NITI will cover schools in 98% of Smart Cities and 93% of districts.

- **Atal Incubation Centres** where start-ups and budding researchers can experiment their innovation
- **VAJRA** scheme and **IMPRINT** scheme where foreign faculties will be involved to foster innovation in universities and the academia efforts are translated to start-ups under **Start-Up Academia Alliance Programme.**

CINVERTING IDEAS INTO PRODUCTS:

b. **Technology and Innovation Support Centres (TISCs)** under Commerce ministry creates regional hubs where researchers and academia meet to solve problems identified by government e.g. **Anna University** one of TISCs.

c. **Self-Employment and Talent Utilization (SETU)** programme to bring techno-financial and incubation facilitation for start-ups at industrial level

EQUITY IN INNOVATION:

d. **SATH Program** to bridge gaps in education and health and build human capital which acts as foundation of our innovation-led society. McKinsey and IPE Global Consortium are involved for fostering innovation in backward districts.
e. Rural version of innovation policies in urban areas is being done under the **Deendayal Upadhyay Swaniyojan Yojana.**

EASE OF DOING INNOVATION:

f. **Start-Up India scheme** to provides an environment friendly for start-ups,
    - Simple compliance regime
    - Single window clearance
    - Start-up India Hub which is an institution to address all issues of start-up in all its phases
    - Credit Guarantee Fund
g. **Angel Tax reforms** to ease doing business of the innovation-centric entrepreneurs
h. **National IPR Policy** creates a friendly environment for filing patents and encouraging innovation
i. **CIPAM** is created for regulating and fostering innovation through policy interventions and attractive incentives like tax breaks.

CHALLENGES:

a. Outcome levels of school education is poor (**ASER report**) and the inertia of teachers are preventing making kids future innovators. Above half of Class V students cannot do Class II maths.
b. No **regulatory direction and incentivisation** since mandate of **CIPAM** is far from meeting the demands of industry, we need to revamp the defunct National Innovation Council
c. **Finance allocations** is not up to the mark and banks are unwilling to finance the start-ups due to risk consciousness in the **NPA era**
d. **Ease of doing business** for start-ups is lacking—getting electricity takes 80 days at least
e. Our **IPR regime** has not attracted lager MNCs who have capacity to hasten the innovation culture. The **Special 301 Report** of USA ranked India repeatedly in lower position which discouraged MNCs in investing for India's innovation related issues.
f. Only recently, **Social Stock Exchange** has been announced under which social start-ups can access funds.

However, government set the target of creating **a billion innovators** by 2022 and the recent budget says the duty of government is to create a meeting point between innovation and social concerns so that we unleash an innovation-led way of life.

12. "No field of technology is as impactful as Information and Communication Technology in changing human lives". Discuss in light of the ICT developments in last few years and show the future direction it is taking.

UN's ITU in its ICT Development Report said "*ICT created a revolution and brought a globalised society by creating one big **global village***". Its achievements are proliferating and unleashing a world that is unprecedently interconnected creating both opportunities and challenges.

ICT DEVELOPMENTS:

a. **Artificial Intelligence**—it involves machines behaving with human capacities. We have humanoid which do manufacturing to being a household servant in aged nations like Japan
b. **Internet of Things**—by connecting various devices through internet it is automating the processes in predetermined style e.g. farmer if calls to number motor ill switch on to irrigate farm by mixing fertilizer from tank through a pump and stop itself with help of sensors. This is bringing a world of **Cyber Physical Systems.**
c. **Bigdata**—bulk of information is processed to draw inferences e.g. to understand a consumer's favourite food and post ads in his Facebook page—**data mining**
d. **3D Printing**—also called as **additive manufacturing,** it involves data-based manufacturing of 3D shapes by a machine backed with computer which is programmed eg. with CMC and CAD programming
e. **Blockchain** Technology—decentralising the information and making it tamper proof with which citizens are becoming currency miners (**cryptocurrency**—Bitcoin) and public records are stored for improved transparency in governance
f. **5G**—it is upgrading present 3G LTE to 5G speed which will enable the imminent 4th IR.
g. **Quantum Computing**—it increases the processing speed of computers so that information is transmitted at rocket speed and making it difficult to be hacked.

These are enabled by upgradation in satellite technology and launching (GSLV Mk III), increased data availability from social media, etc.

DIRECTION:

Ways of production & distribution:

a. Socio-economic life is taken to next level which is fundamentally different. In primary sector, **precision agriculture** is bringing machine-centric agriculture
b. In secondary sector, these data-led automations at high speed are unleashing **4th industrial revolution** where machines decide and manage manufacturing

Social and moral direction:

c. This also creates various **privacy** issues and leading to efforts like **data localisation.**
d. Positively it eases things like manual scavenging, mining, etc., which could be done by robots like the **Bandicoot robot** developed by IIT to do scavenging
e. It affected health as **nanorobotic surgery** of eyes, digital boards of school, virtual reality for skill development

f. **Unemployment and ethical questions** are on rise, what if machines become racists? (with algorithms they can be made to behave in racist manner) Other ethical questions are,
   - Ability of machines to super-intelligence and dominate humans
   - Issues like accountability, predictability and safety
   - Moral status of machines once they attain **sentience i.e. capacity to feel pain and suffer.**

g. The problem of **digital divide** needs to be prevented (internet penetration in India is just around 37%) and digital illiteracy is very less than normal illiteracy which is at 25-30%.

Security situation

- Access of these **technologies to terrorists** will further make it fatal. This is believed to hasten the globalisation of terrorism with faster ICT developments and easy access to anyone
- There is also fear of **autonomous weapons** which is in its embryonic stages in countries like Israel.

Environmental issues

- More ICT dissemination means more **electricity** consumption
- Fight for rare earth metals will increase with dependence on electronics. **NASA** has begun efforts to mine similar minerals from **Asteroids**.
- **E-waste pollution** is already bringing widespread environmental degradation which will rapidly increase

As WEF as predicted all these ICT developments will **create a revolution in values** that will be more than 4th IR. To direct it towards desirable path, science and society should converge as intended in our **STI Policy 2013 (*science for society and society for science)***.

13. Briefly give the meaning of 'plastic economy' and explain how unsustainable use and management of plastics pollute our environment. Discuss the dilemmas and scepticism in abating plastic pollution.

Plastic economy is a phase of world economy wherein it become increasingly dependent on plastic for **production and distribution of essential goods and services** in such a way that it become a "critical ingredient" of economic activity.

WEF calls present condition as International Plastic Economy in its report ***New Plastics Economy****: Rethinking the future of plastics.*

POLLUTION BY PLASTIC:

We produce **5.6 million tonnes** of plastic waste is generated per annum all over India but **90%** of it is not recycled. Effects are:

a. Excess demand on **fossil fuels** to produce plastics-leading to air pollution and climate change

> **Single Use Plastic** production is three-times **carbon intensive** due to their voluminous usage and also its production process is unsustainably **water-intensive**.

b. Improper disposal leads to **choking** of sanitation and spreading epidemics of malaria and cholera and also urban floods during monsoons as in **Chennai Urban Floods** 2016 and 2018.
c. **Land pollution** since the toxic released from it makes land infertile

> In landfills, instead of decomposing itself, plastic **catches fire** due to excess methane generation and adds to the air pollution.

Plastic waste at roadside is also unintentionally consumed by **animals**.
d. **Water pollution** in same manner especially the Yamuna River.

> Number of plastic polluted rivers increased from 121 to 275 in last two years. Plastics affected lake by increasing deposition in it and reduced its water-storing capacity and made it dirty, especially in tourist sites. Need **eco-tourism**, this is the case with famous **Nainital Lake** which is being saved from plastic under **Mission Butterfly.**

e. **Marine pollution** since microbeads causes loos of lives in oceans and the bioaccumulation of plastic ends up them in our plates as food

> 90% of plastics ends up in seas and they travel through rivers polluting both. WEF tells by 2050 plastic quantity will be more than fishes in seas.

DILEMMAS:

Beat Plastic Pollution declaration was given by UN on June 5 World Environment Day. But there are dilemmas:

a. What is the **alternative** to plastic? It is doubtful how **cheap** the alternative like bioplastic can be.
b. To what extent we should contain plastic—only single use and multi-layered or all plastic—5-day debate occurred in **UK Parliament** without conclusion for passing **Plastic Pollution Bill 2017.**
c. Should we give exemption to **MSMEs** and petty traders like Kirana shops?
d. Since **statistics** are not available there are dilemmas in understanding the supply chain (NITI Aayog three-year agenda)
e. Plastic works with other pollutants like sewage, emissions in polluting environment, so there is dilemma about their **standalone effects**

SCEPTICISM, the possibility of eradicating plastics is doubted:

a. Vested interests like **trading bodies** prevent ban on plastic eg. after announcing plastic ban Maharashtra gave exemption to kirana shops in 2 days
b. **Educating people** is missing link since plastic has made their life very easy
c. **GDP loss** amounting to 0.3 to 0.5% is predicted due to supply chain disruption (packing) so commitment of government is doubted

> Plastic Bags Ban alone caused 15,000 crore loss and loss of 3 lakh jobs (Plastic Bags Manufacturers Association).

d. It is said that removing plastics that entered oceans is **impossible.**
e. Also, without working on **water and land pollution**, plastic abatement is doubted.

UN Ocean Conference 2018 has recorded these dilemmas and scepticisms and it has set study groups to address them. **Clean Seas Campaign** is taking such efforts to next level.

So, we reached a point of no return as per sceptics. While that is exaggerated, zero plastic is a utopian idea—Indian government says ***"instead of eliminating plastic its ill effect should be reduced"—***Plastic Rules 2016 does this.

14. Enumerate the findings of IPCC's 1.5 °C Report and WWF's Living Planet Report 2018. In view of the above, show the changes to be made in sub-missions of National Action Plan on Climate Change, 2008.

IPCC and WWF are "hubs of knowledge on anthropogenic activities" and they have been helpful in guiding the humanity regarding the perils we encounter. Suitable interventions have been made based on their findings, interestingly, UNFCCC itself is adopted in light of IPCC findings in various reports of 1989.

WWF's LIVING PLANET REPORT:

Its findings are,

i. Between 1970 to 2014, for species with backbone, population reduced by 60%. Also 80% of freshwater vertebrate population plummeted
ii. Extinction rate is 100 to 1000 times faster than few centuries ago
iii. Such extinction is called "mass extinction event" and this is sixth such extinction
iv. Deforestation fuelled by soya bean and palm oil plantations and livestock grazing catalysed shrinking of tropical forests-e.g. 20% of Amazon forest disappeared in 50 years!
v. From 1950, 6 billion tonnes of fish were caught and year-on-year, the availability of fish is declining, endangering costal community livelihoods
vi. 50% of corals and mangroves are extinct. Also, even if ambitious goal of limiting global warming to 1.5-degree Celsius is achieved, 70-90% of corals will die!

IPCC ASSESSMENT REPORT

Its findings are,

i. The world has already warmed by 1°C from the beginning of industrialisation
ii. Between 2030 and 2052 the warming will **rise to 1.5°**C
iii. The Paris Pact goal is to limit warming to 2°C, but the report encourages world leaders to keep it between 1 to 1.5°C
iv. If warming is limited to 1.5°C instead of 2°C, humankind can reap following benefits:

- There would be **fewer deaths and illnesses** from heat, smog and infectious diseases.
- There would be substantially fewer heat waves, downpours and droughts.
- People suffering water crisis can be halved
- **Seas would rise nearly 4 inches** (0.1 meters) less.

- The West Antarctic ice sheet might not kick into irreversible melting.

v. It suggests the following:

- INDCs under **Paris Pact** are insufficient and global leaders should make rapid and far-reaching changes in the governance of environment
- Limiting temperature to 1.5°C needs successful development of **carbon removal technologies** which are yet in conceptual stage
- Switch away from fossil fuel should be made soon but energy from non-fossil fuel will be 3-4 times expensive
- If these measures are taken, we can **save 100 million** (10 crore) people, who are supposed to die by 2100, if warming is not prevented.

In light of the above deteriorating conditions we need to bring following changes in missions under NAPCC:

1. **National Mission on enhanced Energy Efficiency—**
   - Capacity addition of 19,598 MW, fuel savings of 23 million tonnes/year, GHG emission reductions of 98.55 million tonnes/year at full implementation stage
   - Energy saving of 8.67 million tonnes of oil equivalent (30 % above target) achieved in the first phase
   - However, in other areas the scheme has almost failed. CSE report says negligible technological efforts have been taken to take forward energy efficiency programmes.

So, **technology** should become a new parameter and extra credit should be given for trade happening in **PAT (Perform Achieve Trade) market** under this mission.

2. **National Mission on Sustainable Habitat**—
   - Being implemented under Smart Cities, AMRUT, Swachh Bharat Mission and urban transport programmes
   - But even eight years after its launch, NMSH has no specific funds
   - The above four flagship programmes are not explicitly driven by or linked to NMSH objectives. NMSH become umbrella term for urban schemes. So,
     - we need to ***reform all the urban schemes to meet its alignment with NMSH***
     - Urban Ministry budget should go to this mission fully and funds should be released from there.

Also, the scheme needs to be aligned with principles of UN Habitat III.

3. **National Mission for Sustainable Agriculture**
   - Brought to climate-proof agriculture and reduce emissions from the sector
   - For instance, government aimed to test 140 million soil samples but only 32 million were tested and Agro-forestry has not been enabled due to unfriendly felling and trading rules till date. So, governance reforms are required,

Above all, in light of climate change and rising population—**PLATE GENOMICS** should become part of the mission to meet the food security needs.

4. **National Water Mission—**
   - The increased melting of Himalayan glaciers and the need to harness them instead of leaving them to become floods is lacking in this mission
   - A component called "**harnessing new water additions** with transfer from surplus to deficit areas" can be added.
   - **Dam Rehabilitation** should be added in light of climate change led dam failures (Kerala floods)
5. **National Mission on Strategic Knowledge for Climate Change (NMSKCC)—**
   - The **Global Technology Watch Groups** under this scheme should be asked to study the effects on Keystone species which is missing at present
   - Also lack of knowledge on **apex predators** is leading to man-animal conflict which should also be studied from Savanna region by the GTWs
6. **National Mission for Sustaining the Himalayan Ecosystem—**

In this mission also the focus is on attaining knowledge about ecosystem changes.

- But there is huge duplication of efforts between this mission and NMSKCC.
- So, **both missions need to be clubbed**, because much of the research findings have not been changed into policy action
- By integrating the knowledge gained under above two missions along with IPCC findings **CLIAMTE CELLS** should be formed for generating new policy actions.

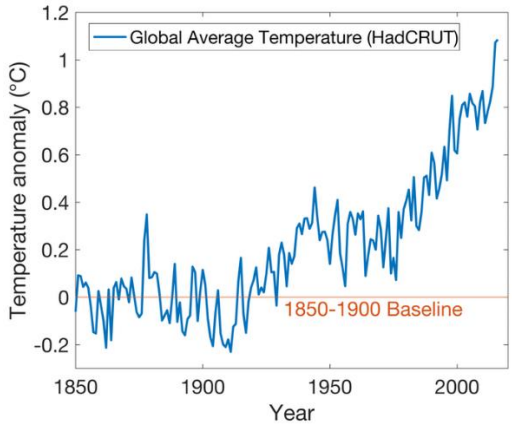
National Solar Mission and Nation Green India Mission do not need principle-level changes, only implementation issues suffer them eg. overcoming seasonal interruptions in solar sector.

By doing these activities we can hope to contribute for achieving Paris Goal. To do all these **two broad issues** needs to be addressed—**climate finance** to Global South from Global North and **effective law enforcement** to protect biodiversity including WPA 1972, Water and Air Acts, Forest Acts and EPA 1986.

15. In what ways climate change has altered the character of disasters? In view of the above, examine how to reorient the vulnerability assessment and mitigation related efforts for disaster management.

Climate change is the warming of globe due to drastic rise in temperature from mid-17th century levels i.e. the pre-industrial levels due to unsustainable anthropogenic activity especially industrial revolution.

The mean global temperature in 1800 was 13.7 °C but in 2018 it rose to exactly 14.7 °C.



Disaster is an extreme weather phenomenon which is made much more extreme by climate change. World enters a new normal of **double-charged disasters**.

A. CHANGES IN CHARACTER:

a. Erratic monsoons causing droughts—increasingly wet regions are also undergoing drought as in recent Madhya Pradesh drought 2018. Changes in monsoon cycle is caused by **El-Nino** events due to climate change

IMO says **El-Nino's frequency** changed from once in 8 years to once in 2.5 or 3 years and it is attributed to raising ocean temperature.

b. Severe cyclones as a new normal—intensifying oceans like Arabian Sea and Caribbean Sea as caused more severe cyclones per year eg. **Hurricane Katrina** in USA.

c. Cyclones are also undergoing **re-curvature** as in **Cyclone Ockhi** and causing floods and endangering livelihoods of fishermen

d. Normal rainfall becoming excess rainfall due to **cloudbursts** as warming increased the moisture and in turn increased latent heat of vaporisation in clouds forming cloudburst eg. **2013 Uttarakhand disaster**

e. Forest fires in new areas eg. **California Forest Fires 2018** due to excess temperature.

f. Snow storms or Blizzards are increasing in temperate region owing to

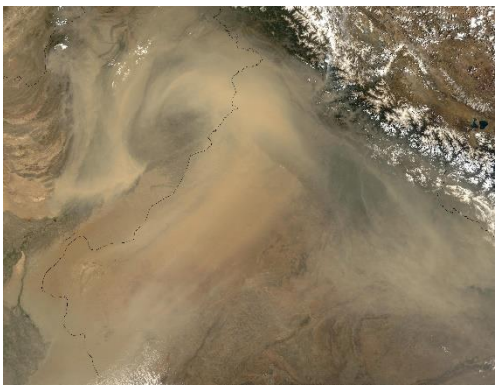
- change in wave pattern of **jet stream** and
- breakage of **polar vortex** caused by climate change.

Example, **2018 New Jersey Blizzard**.

g. Heat wave mortality is also increasing since air mass is getting warmer creating unfavourable ambient condition causing dehydration,

h. Dust storms caused by intense heating of loose-soiled areas is also increasing in number

Example: May 2018 Thar Desert Storms (125 people dead)



i. Monsoonal floods are becoming unbearable due to melting of glacier in North. Sorrow of Bihar from Kosi river quadrupled as seen in **Bihar and Assam floods 2019**.

Himalayan glaciers will entirely melt by 2100 if glacial melting is uncontrolled.

j. **Water stress** is causing economic and social activity to undergo disasters. **2019 Chennai drinking water** crisis has proved it already.

REORIENTING,

A. Vulnerability assessment:

- Pan-national instead of regional assessments needs to be made:
  - Drought and flood occur in **unexpected region** nowadays—**Rajasthan floods** in 2017
  - The **Vulnerability Map** should be **updated** every year and data analytics can be used for automatic updating of data from sensors.
- **Socio-economic status** of the victims should be assessed and **layered understanding** of vulnerability should be improved. Interventions can be planned accordingly.
  Poor are the most hit class so we need to assess impact of disaster on poverty.

UNODR report titled **"Economic Losses, Poverty and Disasters (1997-2017)"** says, ➢ India lost 79.5 billion due to climate-led disasters ➢ Major part of it goes to poverty in hidden way and we don't have data for 63% of cases.

  So, vulnerability assessment should focus on socio-economic assessment—fishermen, delta farmers and backward class in coastal states should be the target.
- **Industrial activity** is getting affected due to climate change,
  - **IT companies** in Bengaluru and Chennai have asked their employees to work from home. So, now vulnerability assessment should extend to these sectors
  - Around **15 SEZ and Townships** planned in Tamil Nadu around Chennai Industrial Corridor have shifted them to other states.

  The vulnerability faced by these sectors include—loss of infrastructure and breakdown of supply chains.

B. Risk mitigation:

Once vulnerability assessment is updated to meet the changes imparted by climate change the risk mitigation will as a consequence change

- Disaster Management Plans should include **climate resilience** as a component now
- For drought, **water-use efficiency** should be increased to sustain the demand with low water availability, drip irrigation can be used
- For floods **inter linking of rivers** will reduce the risk of severe floods caused by cyclones and increasing cloudbursts
- For dust storms—people can be educated to **plants tress** around settlements and use wind breakers which breaks the winds and so its dust carrying capacity
- Heat waves can be mitigated by **changing diet patterns** (cucumber) easy access to **drinking water in public places** preferably in pots, a set of **skilled volunteers** in every ward or panchayat who can respond to sudden sickness of senior citizens in public places, conserving lakes and other wetlands will decisively preserve the favourable microclimatic conditions.

MIT Researchers have found connecting dots between possibility of **increase in earthquakes, tsunami** due to climate change.

- Change in pressure levels due to climate change caused temperature changes will affect the pressure in fault lines leading to quakes
- If occurred in deep oceans it leads to Tsunamis.

Sendai Framework's main aim is to **reduce mortality and property loss** by reducing the risk. With changed patterns and intensity of risk due to climate change, risk assessment and resilience building should happen which should even include upgrading skills of **Disaster Response Forces**.

16. Examine the need to promote energy efficiency and renewable sources in the energy basket of India. Discuss the role of Energy Conservation Act, 2001 and Electricity Act 2003 in this context.

Energy efficiency is defined as the optimal use of scarce energy to ensure the present demands are met with reduced amount of energy by avoiding wastage, over-use, technical losses, etc.,

NEED TO INCREASE,

A. ENERGY EFFICIENCY:

a. Energy security will be otherwise endangered since by **2050** by energy demand will peak by **45%** without substantial increase in supply
b. **Sustainable development** needs this because it will reduce the production of electricity from coal, lignite, peat, etc., owing to **SAVINGS** as a result of efficiency

c. By increasing efficiency, the **peak demands** can be met and power shutdowns especially to industries can be avoided
d. **Villages** unconnected to Grid can use their solar sources and meet all the demand if it is used efficiently
e. To reduce **carbon emissions**, we need to promote efficiency
f. After shifting to renewables like **solar and wind seasonal breaks** in current supply will be there where energy savings becomes crucial for sustaining demand.

B. RENEWABLE SOURCES:

Only 20.2% of energy produced is from renewable sector

a. Renewable can help us reduce the carbon-intensity. Solar, wind, biofuels, etc., are carbon free and even biofuels promote **carbon sequestration**
b. We can meet **INDCs** targets under Paris Pact where our share in renewables should be promoted to at least 40% by 2030
c. Shift to renewable will reduce **import of coal and also oil**
d. We can **export** the renewable technologies and earn forex reserves, also we can build capacities of third world nations like Africa

ROLE OF,

A. ENERGY CONSERVATION ACT 2001

a. This act was passed to promote energy efficiency and improve **energy security** by bring habitual changes in consumers and producers
b. It establishes **Bureau of Energy Efficiency (BEE)** to promote energy efficiency in India. BEE has come up with,
    - **Star Labelling of electrical appliances**—it has star rating based on energy efficiency eg. tube lights
    - **Energy Building Code and promotion of Green Buildings**
    - **It also promotes LEDs in cooperation with REC**
c. It empowers centre to find **energy-intensive industries** like chemical industry and mandate them to use preterminal level of energy per day. For violations penalty can be imposed
d. **Energy Audits** of public buildings and industries are provided under this Act
e. The Act also tells while meeting the fiscal principles, government can increase its **investment** to promote efficiency
f. It also talks about **educating people** especially school children about energy conservation.

B. ELECTRICITY ACT 2003

a. This act is meant to regulate *electricity production, supply and price-determination*
b. It provides for **Central and State Electricity Regulation Commissions** who are empowered to do above functions including determination of tariffs
c. Most popular provision is the **Renewable Energy Purchase Obligations (RPOs)**—here states will sign MoU with renewable energy producers and they are under compulsion to buy renewables:

- By this a **business model** with sustainable market for renewable producers is created
- A habitual change in state purchases of power is brought

d. The CERC and SERCs are empowered to determine the **rate of tariff** between **inter-state renewable trade**. This is to promote competition and also prevent predatory pricing or excess pricing
e. For such trade the CERC is empowered to create a **energy trade exchange.**

Despite lower share in overall production, the renewable sector growth is faster than traditional growth owing to faster capacity augmentation due to government efforts like Green Bonds.

In terms of energy efficiency, NITI Aayog's **State Energy Efficiency Preparedness Index** clearly indicates us if low-performing states meet their targets we will go a long way and India can be energy secure while achieving **SDG-7—Affordable and Clean Energy.**

17. Analyse India's preparedness to encounter the security threats from Outer Space and Ocean Space by suitably highlighting the technological upgradations and various other preparations.

There is rise in insecurity, nations are building weapons in space and instead of land, ocean is becoming theatres of war as seen in disputes like South China Sea, and issues like String of Pearls, etc.

So, threat from **outer space** is increasing:

- In form of missiles and nuclear weapons—Pakistan's **Babur missile**
- There is a 38% growth in number of **ICBMs** across world
- Unsolicited entry of **drones**
- **Hijacking** of air planes, eg. Malaysian flight hijacking 2014
- **Nuclear Posture Review 2018** of USA hints at building weapons in Space

So, experts are claiming the battlefield is getting prepared for **SPACE WARS.**

Also, **maritime threats** include,

- Establishing of **military bases** and encircling a nation, china does this and is encircling India—**String of Pearls** by China
- **Maritime territorial disputes** like Indo-Pakistan Sir Creek issues
- There is also increasing fight for **maritime resources** eg. gas hydrates in SCS
- There is threat to **freedom of navigation** and travel in seas eg. oil tankers are being attacked in Persian Gulf due to US-Iran rivalry.
  Indians are also captured as they were part of the tankers seized by Iran.

INDIA's PREPARENESS:
India's preparedness is broadly about technological upgradations and few other reforms,

A. TECHNOLOGICAL PREPAREDNESS:

a. **For threats from outer space,**

- Under **Mission Shakti** DRDO has developed **ASAT** i.e. Anti-Satellite Technology, this will ensure the enemy's satellite can be immobilised and harmed if they pose threat to us
- We in final stages of importing **S-400 Trimuf** Anti-missile system. It has **PANORAMIC RADARS**, which can
  - Detect threats in space even if they are 600 kms away
  - And attack them when they are 400 kms away
- We have Long Range Surface to Air Missiles being developed with Israel like **Barak missile**
- **We are developing** with Russia the supersonic speed **BRAHMOS supersonic** missile.

b. **For maritime threats:**

- **INA Arihant** with stealth technology has been operationalised which is a submarine that can handle threats imposed by China in Indian Ocean
- Nuclear attack submarines which will navigate in ocean surface and attack enemy targets include **Akhula class INS Charkha** and we will lease one more from Russia shortly
- **Scorpene class** Kalavari submarine is to start sea trials and with its Air Independent Propulsion system it can stay underwater for long
- **Astradhani** is a torpedo which will be used to attack a submarine of adversary.

B. **PERSONNEL REFORMS:**

- A **tri-service command** which can quickly mobilise land, air forces to meet threats from maritime space. This command will operate from **A&N Islands**
- A seamless linkage between, **Indian Navy, Indian Coast Guard and Indian Police** is being developed under Coastal Security Scheme 2008.

C. **PROCURMENT ADMINISTRATION:**

- In light of the changing nature of threats defence procurement is reformed
- **Defence Acquisition Council** is given **more powers** to make faster purchases in non-red tape environment.

D. **INSTITUTIONAL** mechanisms like increasing the mandate of **National Security Advisor** to handle space wars

E. **INTERNATIONALLY** India is working at UN to encourage nations to amend the Outer Space Treaty to meet the changing ne

In light of these issues, **Maritime Security Strategy 2018** was announced for the first time in India. However, we don't have a Plan to handle Space Wars. So, in light changing nature of security, a **National Security Doctrine** is necessary to meet threats from increasingly uncertain world.

18. "Kashmir and tribal-belt extremism are caused by politico-cultural, international and social factors, but underdevelopment is widely believed as cause behind such extremism there". Do you agree? Argue your case.

Kashmir separatism and Naxalism are twin threats of India's internal security. Former PM also said this is the most challenging threat to internal security and both have attained a level of terrorism either internal or externally aided.

UNDERDEVELOPMENT AS A CAUSE:

A. Tribal belts:

The **Telangana Movement of 1947** shown that tribes are disappointed with the development process and especially about land reforms.

- The failure of **land reforms** especially land redistribution after independence
- Increase in encroachment into **forest rights**
- Forced **displacement** and loss of livelihood as a result.

These led to rise in poverty of tribes whereas poverty of other communities was declining. Amidst this the **communist revolutionaries** who were initially political forces, used these tribal dissents to make it into extremism.

Now Naxalism become a violent extreme movement whose aim is to overthrow the State and establish a new Communist government which will give development for all using ideas of Karl Marx

For this, Naxals have created,

k. An **army** and recruited the tribal people
l. Established **parallel governance** like collecting taxes
m. Executing attack on security forces like CRPF eg. **Surma Attack**
n. Training women and children with extremist ideology and using techniques like **guerrilla war**
o. Having **linkages with adversaries** like China and Sri Lanka's LTTE.

B. Kashmir:

Kashmir was a princely state which was integrated within India with more autonomy for it. But few inconsistencies in the promised autonomy like imposing **President Rule** has led to resentment from local people.

Topography of Kashmir which does not allow rapid development and also **Partition** of India which divided the Kashmir region affected the economy owing to **reduction in trade and deindustrialisation**.

People started to concentrate on preserving autonomy for while they came to streets and this affected the governance of State. Health, education and the skills have deteriorated especially **tourism** reaching a point where poverty become acute and unemployment widespread by 1980s.
Pakistan used this opportunity and radicalised Kashmiris by **1989** with extremist jihad ideas. So, development was converted to extremism,

a. **Recruiting youth** into terror camps like **LeT**

b. New terrorist organisations like **Hizbul Mujahideen** of Burhan Wani
c. Pellet protest by people against Army men,
d. Killing of neutral journalists like
e. Using **social media** for radicalisation of youth

So, development is widely believed to be the root cause:

However, **other factors** cannot be ignored,

a. **Political** factors like role of Marxist **ideology** in Naxalism and Article 370 related issues and misuse of Article 356 (PR) in Kashmir. They have given a world-view which put them at oods with Indian Republic
b. **International** factors like role of **Mao's China** and Pakistan's **ISI** by radicalising and funding terrorist through **counterfeit currency** and separatist activities. Also, the sudden escalation in Kashmir conflict by 1980s should be understood in the context of **Russian invasion of Afghanistan** and the rise of **Mujahideens**
c. **Cultural** factors like role of religion and tribal culture who seek independence and non-encroachment from mainstream majority culture.
d. **Environmental** factors like forest degradation and loss of food and employment from it also antagonised tribes. **Construction of dams** is seen as noble activity by mainstream but as threat to lives by tribes.

Hence, a host of factors have caused extremism in these regions. ***While underdevelopment is a dominant cause it is not the only cause***. This is reflected in India's **two-pronged** strategy to deal with extremism—**force** for short-term and **development** for long-term alleviation of extremism.

19. Discuss India's milestones in defence indigenisation and defence procurement. Highlighting the debate between supporters of transparency and national security, explain the role to be played by media.

Defence indigenisation is a long-term aim of India and it has begun with establishment of DRDO. However, it was limitedly successful and we rely on defence procurement from foreign nations yet, which is also mired with controversies especially corruption charges.

DEFENCE INDIGENISATION:

1. **DRDO** has successfully developed various systems to augment Indian Navy, Airforce and Army
2. For **Navy** it has developed torpedoes like **Varunasastra** and it develops **Air Independent Propulsion** system to help submarines stay long in water
3. For **Army** it has developed tanker systems, it also produced ARTILLERY systems like **Precision-Guided Artillery System** and **ATAGS Howitzers**
4. For **Airforce**, drones with stealth technology has been developed eg. **Rustom drone.**
5. In general,
   - **Mission Shakti** for Anti-Satellite System called **KAUTILYA** has been developed
   - **Brahmos missile** is being developed with Russia

- India's nuclear weapons have been successful with its **"Integrated Missile Development Programme"** under Missile Man Ab**dul Kalam** it includes—Agni, Trishul, Akash, Nag and Prithvi, etc.,
  AGNI-V capable of crossing 5000 Kms took India to new heights which also has **re-entry technology.**

DEFENCE PROCUREMENT

a. Indian Defence Procurement happens for long and it is robust with former **USSR** from whom we developed the **anti-attacker Ship** technology
b. After long gap, a procurement policy has been published with consequent amendments and latest one is the **Defence Procurement Policy 2016** and Draft Defence Production Policy which provides for
    - Mandatory transfer of technology
    - Private participation in defence is being improved for faster and efficient production. **Strategic Partnership Model** is adopted with **Make-II category** under DPP 2016 having many incentives,
        - **1000 crore** defence **start-up hackathon** was conducted
        - **81 licences** were given to start-ups for production
    - **IDDM clause**—Indigenously Designed, Developed and Manufactured which promotes not only technology purchase but also indigenisation
    - We have purchased hi-tech crafts like **Bofors** in 1980s and we are purchasing now **Rafale** Aircrafts
    - Our **dependence on Russia** is such that **75%** of our defence imports are from Russia so diversification of it by procuring from USA and France and Israel are another milestone
    - We also sign contracts like **LEMOA** which are necessary to purchase hi-tech equipment's from USA. Now India comes under **STA-1 category** which means we will be treated like NATO ally
    - We also maintained our **strategic autonomy** and went ahead to purchase Russian weapons despite possible sanctions under **CAATSA** by USA

But issues exist like,

- Government preference to PSUs instead of private is hampering private investment
- Lack of clarity on land acquisition
- Unfriendly IPR regime
- Corruption charges
- Delays in delivery
- Poor maintenance-related terms in agreements leading to long-term issues that affect the future deals also.

DEBATE:

Defence procurement issues are always subject to debate where one side supports transparency of procurement details (including price and technology) and on other side national security is seen non-negotiable and opaqueness by government is justified.

- Transparency is supported because,
  - Corruption suspicions demand disclosure of pricing details. Such charges are increasing for instance former **Air Marshal** has been booked by CBI for corruption
  - It is considered a right i.e. **right to know** about governance information (RTI Act 2005)
  - In Rafale deal, the pricing details were sought.
  - Disclosing details is sought to cool down **insecurity fears** because knowing the security upgradations will give confidence to people.
- But national security is considered primary because,
  - Disclosing secret information about weapons will help **adversary nations to know our upgradations** so that they will build up counter weapons
  - **Inter-Governmental Agreements (IGAs)** are signed in which pricing details are not allowed to be shared by purchasing nation. This is a restraint in Rafale issue
  - **Official Secrets Act 1923** permit maintenance of secrecy even in domestic issues so international level defence dealings can be kept in hidden manner
  - **Spies** can misuse the disclosed details
  - So, government is ready to submit the details only in "sealed-cover" to adjudicators like **CAG** and **Supreme Court**, which it has done.

MEDIA is called fourth pillar of democracy because it brings information to doorsteps. Recently the popular national daily, ***The Hindu,*** has been accused by government for doing **espionage.**

The journal disclosed the secret information about Rafael deal. But this is seen as,

- Violation of Official Secrets Act—this amounts to **espionage**
- Supporters claim this has created a disincentivising environment so that government officials will be **deterred from corruption—** that is the **aim of investigative journalism**
- Opponents claim that the **sellers** like France **lose confidence** in India when secret information is disclosed.

Media role should be,

i. Within the **legal limits**
ii. **Investigative journalism** should also include **national security** as a standard
iii. Media should disclose its information first to **judiciary** under **PIL** and prove that government has misled nation with wrong information, if judiciary validates the information can be disclosed in newspapers.
iv. Press Trust of India should come out with special code of conduct for Media in case of defence and it can be harmonisation of both side—**transparency and national security**

v. **Media** can also seek the **Parliamentary Committee** and present its information there.

The golden rule of **professional ethics** is to do minimum harm one of the two equally important conflicting goals. If there are channels to address transparency concerns without affecting national security as stated above it should be first used.

Media Activism but should point to a larger problem. As a fourth organ of democracy it comes into picture only when first three organs fail in their duty. If **Joint Parliamentary Committee** is formed for every defence deal then the investigative journalism by media will become redundant.

20. Bring out the differences in terrorism unleashed by external state and non-state actors. Explain how India should respond to the penetration of ISIS into South Asia aftermath of its fall in the Arabian Desert.

Terrorism is the use of violence in a mass level to strike terror in hearts of the targets so that the socio-political demands of the terrorists are accepted by society which is hard to be accepted otherwise.

Terrorism was unleashed usually by non-state actors, of late, governments themselves become perpetrators of terrorism against their adversaries. India tells **Pakistan** sponsors terrorism against India.

DIFFERENCES:

a. The **objectives** of non-state actors are mostly **social** objectives like religious freedom or national independence sought by ethnic community like Kurds of West Asia.

   But External State terrorism is to achieve objectives of **foreign policy**. IB report tells that the policy of ISI of Pakistan is ***to tear India into pieces and make it bleed***

b. NSA have very less **resources** but ESA have technological and administrative powers with them which makes their sponsor of terrorism more robust. Pakistan Army is considered to misuse nationalism and enlarge its power in name of national security. It is called **Deep State**

State does not run the Army, but Army runs the state in Pakistan.

c. NSA want to **radicalise** the people to be recruited but ESA can use their government authorities eg. **spies** are mostly government intelligence officers
d. NSA if caught are treated with heavy hand, but the ESA whose spies if caught needs to be treated with diplomatic protocols under **Vienna Convention**
e. NSA do **direct attack**, but ESA go for **proxy attacks**. They support other NSA and enable them to do attack or they indoctrinate people of adversary nation and turn its citizen against their own nation as seen in Pakistan's support to LeT, HM, JeM, etc.,

ISIS IN INDIA:

The recent terrorist attack in South Asia is 2019 **Easter Sunday attack in Sri Lanka** which was claimed by ISIS proved it is aiming deepen its presence in South Asia after it lost ground in West Asia

Government should **respond** by,

INTELLIGENCE:

j. Improving intelligence capabilities and signing MoU with neighbours to jointly collect and mutually share intelligence

INVESTIGATION

k. The capacity of investigative bodies like **NIA** should be improve. The NIA Bill does that
l. The much-needed **Anti-Trafficking Bureau** should be set up and **NCB** should be given capacity building to delink terrorism and trafficking by effective investigation and action on first-line intelligence.

FEDERAL COORDINATION:

m. The state police need to be upgraded with technologies like **CCTNS** and their coordination with central officials should be improved with federal consensus
n. **NATGRID** can be renewed for rapid transit of intelligence information to all levels

COASTAL SECURITY

o. Coastal states should be given adequate focus and a three-tier mechanism police, Coast Guard and Indian Navy should be established

DEVELOPMENT

p. **Development of minorities** should be focussed since underdevelopment will lead to easy radicalisation. Incentives can be given for those terror recruits to come back and surrender as done in Kashmir (e.g. **Nai Manzil scheme**)

CONFIDENCE BUILDING WITH PAKISTAN:

q. The **Kashmir problem** should be immediately solved so that the atmosphere which fosters religious fundamentalism is solved.
r. India should use Platforms like SCO to increase cooperation with Pakistan. The **Kartarpur corridor** is a good beginning.
s. When **USA and Russia** fought together ISIS successfully in West Asia, India and Pakistan can do it more efficiently

INTERNATIONAL COOPERATION:

t. Diplomatic skills should be harnessed to bring **CCIT** into force. Recent **acceptance of CCIT by SCO** makes it more likely since **two UNSC permanent members** gave their green signal.

So, ISIS could act as a push factor to coalesce the disintegrated South Asia. India as a **net security provider** is under higher responsibility. With new-era security threats and **governability crisis** in South Asia, fighting ISIS will be tough challenge but it is not invincible.