

# **TLP 2019 Phase1 GS3**

## **1. Comment upon the transformation of India's planning philosophy witnessed in last decade.**

### **Introduction:**

India's planning strategy has undergone some major reforms in the last decade, including overhaul of entire planning organization, namely Planning Commission and discontinuation of basic planning schemas for the country, five-year plans.

### **Body:**

Changes witnessed in planning philosophy:

- Bottom-up approach- Formation of NITI Aayog has changed the direction of planning process from centralized decision making to decentralized one involving inputs from the states.
- Cooperative federalism- Autonomy to states in various functions including fiscal matters like GST.
- Inclusive growth- Boost to MSMEs instead of just heavy industries, handholding of innovative startups, special schemes for various groups like minorities, backward classes, manual scavengers etc.
- Emphasis on social justice through direct intervention- Instead of subsidies, focus has shifted on more direct approaches like MGNREGA, direct benefit transfer, Jan aushadhi yojana, jan arogya yojana etc.
- Evaluation based planning- Planning outcomes are evaluated on a yearly basis and more focus on governance and transparency.
- Changed planning process- Instead of fixed five year plans, long-term, medium-term and short-term documents on vision, strategy and action agenda have been released.
- Protection of environment- Earlier environment was neglected in the planning and development process, now it is an important element where no project can take off without necessary environmental audits.

### **Conclusion:**

Although, planning philosophy has had major changes in the past decade, still the basic problems like spread and quality of education, poverty, unemployment, and stagnant

growth in various sectors do persist. It is time to show more political commitment in the proper implementation of various plans.

**Best answer: Lucky Verma**

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**2. What are the three primary sources of government revenue. In each of these areas, suggest various measures to increase the corpus.**

**Introduction:**

For developmental and welfare works and day to day functioning, Government requires financial resources. These resources are collected primarily from three sources viz. Direct Tax revenue, Indirect Tax revenue and Non tax revenue.

**Body:**

Direct Tax revenue:

A direct tax is paid directly by an individual or organization to the imposing entity. A taxpayer, for example, pays direct taxes to the government for different purposes, including property tax, corporate tax, income tax or taxes on assets, etc.

Indirect Tax revenue:

An indirect tax is collected by one entity in the supply chain (usually a producer or retailer) and paid to the government, but it is passed on to the consumer as part of the purchase price of a good or service. The consumer is ultimately paying the tax by paying more for the product. Best example of this is Goods and Services Tax.

Measures to Increase the Revenue Corpus:

Revenue can be increased by implementing the recommendations of the Report of Tax Administration Reforms Commission (TARC) or Dr. Parthasarathi Shome Commission.

Some other measures; For Direct Tax revenue:

- A direct tax code on the lines of GST to increase compliance base.
- Making taxing more progressive than regressive.
- Use of Information and Communication technologies.

- Stricter implementation of laws dealing with tax evasion and avoidance such as IT act, GAAR etc.
- Bringing prosperous farmers under taxation
- Strengthening infrastructural and human capacities of the states and local governments as well, to improve tax collection.
- Proper implementation of international agreement and mechanisms like DTAA, OECD's BEPS etc.

For Indirect Tax revenue:

- One of the objectives of GST was enhanced revenue collection, but still there are challenges in its implementation and compliance. Removal of these hurdles will help to achieve targeted revenue collection.
- Devolution of powers to local governments for imposing taxes.
- Petrol and diesel should be considered to bring in the ambit of GST.
- Rationalisation of multiple tax rates within GST

Non tax revenue:

Non-tax revenue comes from the money earned by the government other than taxes, such as profits and dividends of Public Sector Undertakings (PSU), revenue collected from sale of spectrum, royalty on inland petroleum, fees collected from national highways, interests and others.

Such revenue can be increased by:

- Reviving of ailing PSUs through more autonomy, capitalisation and increasing competition within and with private sector.
- Public-private partnerships (PPPs) will enhance the efficiency of public sector units.
- Improving business atmosphere in India (ease of doing business) which will result in higher credit rating and higher confidence in investment in government bonds etc.

### **Conclusion:**

- For government, the need to raise revenues with a tightening fiscal policy, that is increasing taxes, is counterproductive, while cutting expenditure will slow down growth and investments.
- A structured, long-term plan will not only outline the course of action but also help provide predictability to the earnings of the government.
- Government has done well to implement tax-side reforms in the form of GST that will enhance the tax revenues in the long term. A similar reforms-oriented approach towards indirect taxes and non-tax revenues can help it do a better job at balancing the fiscal deficit and public expenditure, ensuring that the growth momentum is not lost.

**Best Answer: Disha**

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### **3. How does regional imbalance in India impede overall economic development? Analyse.**

#### **Introduction:**

Regional imbalance is the disparity in the economic and social development of two regions. Regional imbalances mean wide differences in per capita income, literacy rates, health, education services and levels of industrialization between different regions.

#### **Body:**

Lack of infrastructure facilities, adverse geo-climate conditions, low investment rate, high rate of growth of population, and low levels of urbanization and industrialization are causes of regional imbalances.

Regional imbalance impedes economic development in the following way:

1) Growth becomes unsustainable: depressed rural agricultural regions with poverty and unemployment lower purchasing power of people. As a result, overall demand in the economy comes down affecting other two sectors of economy.

2) Unproductive use of resources in backward regions:

- Additional financial support to special category states has not yielded any desired results and has further perpetuated poor governance.  
Example: Bihar despite being mineral rich state has lower levels of development.
- Lack of education and health infrastructure result into poor social indicators. And hence the available human capital is unable to contribute to the growth of the region.

3) Concentration of industries in urban areas also affects economy:

- Overdeveloped urban areas with over saturated infrastructural capacities negatively affect industries by diseconomies of congestion and higher infrastructure cost thus lowering their competitiveness.
- Concentration of investment by government and private sector in major cities are at risk due to natural calamities like cyclones. It results into massive economic losses at

one go thus diversion of resources to rebuild these growth centres.  
Example: coastal cities like Chennai are prone to cyclonic disturbances.

4) Lack of inclusive growth leads to rise in social unrest, conflicts and left wing extremism. Thus needs diversion of government resources towards security.

5) Growth of Regionalism: growing dissent against labours from other states affect industries. Example: recent migrant labour issue in Gujarat. Lack of cheap labour affects MSME's.

### **Conclusion:**

In India today, a large number of inter-state, inter-community and to a great extent centre-state tensions are because of the persistence of regional imbalances. The need for the balanced development, therefore, is important in the interest of both national integration and people's welfare through economic development.

**Best answer: Deepika Sharma**

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### **4. Innovation is the key to economic growth. Do you agree? Substantiate.**

#### **Introduction:**

Innovation isn't invention. It's the act of refinement and recalibration to achieve particular goals. And when the goal is economic growth, innovation is the single most important factor that distinguishes a prosperous economy from an impoverish one.

#### **Body:**

Fundamentally there are two way of increasing output of economy; first, increase the number of input which go through the productive process, second, think new ways in which we can get more output from the same number of inputs and this can be possible through innovation

(1) Agriculture: only 20% of land is cultivable in Israel after that also they contribute 2.5% of GDP and produced 95% of its own food requirement, this is because of innovation like drip agriculture, soil conditioner etc.

(2) Manufacturing: according to oxford business group, Thailand is the rising manufacturing hub which contributes 9.3 million of job, in Indonesia manufacturing contribute a quarter of GDP etc. all these are possible because of the employment of innovation.

(3) Tourism: Internet, information technology, world wide web etc. revolutionized the tourism sector, across the world contributes to economic growth.

(4) E-commerce: this is itself an innovation a “new idea” which resulted in Amazon, Flipkart and Walmart and now in India it contributes 4% of GDP etc.

(5) Education and skill: Innovation in education and skilling can create demographic dividend by festering culture of demographic temperament.

(6) Safety: New reliable safety features in public offices, schools can ensure women to participate in economic growth.

(7) Administration: New innovative ways of public service delivery like video conferencing with gram sabha etc. can reduce time lag in delivery of services and ensure growth of region but innovation is alone cannot lead to economic growth

(1) Acceptance by society: GM crops were innovated decades ago but still, lots of country including India on its acceptance.

(2) Investment: investment and innovation both are a parallel to each other, for economic growth innovation is needed and for innovation investment is needed.

(3) Skill: countries like china, America are thinking to employ the new innovation like IOT, AI etc. India and many countries of South Asia does not have the required skill for this, at large.

### **Conclusion:**

It is often said that Americans built roads and the roads built the America. At the time, roads didn't offer much economic returns and so even an idea as basic as connecting every place with asphalt roads was truly innovative. Ultimately it delivered unimaginative economic growth and drives home the point that even the smallest of innovations carry the potential to deliver massive economic dividends.

**Best answer: Ranjana Singh Rathore**

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## 5. What do you understand by 'inclusive growth'? What are its dimensions? Discuss.

### Introduction:

Inclusive growth is economic growth that creates opportunity for all segments of the population and distributes the dividends of increased prosperity, both in monetary and non-monetary terms, fairly across society. (OECD)

### Body:

Inclusive growth means economic growth that creates employment opportunities and helps in reducing poverty. It means having access to essential services in health and education by the poor. It includes providing equality of opportunity, empowering people through education and skill development. It also encompasses a growth process that is environment friendly growth, aims for good governance and a helps in creation of a gender sensitive society.

Dimensions of inclusive growth:

- Removing inequality
- Creating employment
- Reduction in poverty
- Health services
- Good governance
- Empowerment
- Skill development
- Improvement in standard of living
- Environment friendly
- Regional disparities
- Human development
- Gender sensitivity

Note: Explanation for any of the 7-8 points is needed in 1-2 lines.

### Conclusion:

India has taken several steps to ensure inclusive growth, however several deficiencies like lack of political will, bureaucratic delays, leakages and improper coverage do exist in the implementation of the respective policies. Taking care of these deficiencies is thus imperative to the inclusive growth of the nation.

**Best answer: The lion**

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Also refer:

<https://iasbaba.com/2017/11/iasbabas-mindmap-issue-inclusive-growth>

## **6. What is vote on account? How is it different from normal budget? Discuss.**

### **Introduction:**

Vote on account under article 116 of the constitution of India is a kind of mechanism to withdraw money from consolidated fund of India to meet day to day expenditures of the government till the budget is passed for the new financial year.

### **Body:**

It needs to be passed by Lok Sabha and is generally granted for two months for an equivalent amount of one-sixth of the total estimate.

Annual financial statement (popularly known as Budget) contains details of both receipts and expenditures of the government. Union Budget (under article 112) and state's budget (under article 202) provides for the receipts and expenditure to be incurred in the next financial year as well as details of budgetary estimates for the present and previous years.

A vote on account is different from the normal budget in following ways

- While vote on account is required for two months and granted for one – sixth of the budgetary estimate, budget provides details of expenditure and receipts for three financial years.
- While vote on account is temporary provision to meet expenditure until the budget is passed, Budget is financial outlays of the government for the whole year.
- While vote on account deals with only expenditure side of the government, normal budget deals with both expenditure and revenue side of the government.
- While no changes are made to tax and duty structure and new schemes are not announced in vote on account, in budget changes are made and new schemes can be announced
- Outgoing government presents vote on account only in election year, budget is presented in every financial year.



- Vote on account is passed by Lok Sabha without any discussion, budget passes after discussion and voting on demand for grant.

### **Conclusion:**

Thus it can be said that vote on account is also important part of budgetary provision of the constitution for successful running of the government.

### **Best answer : Monika sridevi**

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## **7. The implementation of post independent India's biggest tax reform i.e. the Goods and Services Tax (GST) has completed more than a year. What are your views on the impact of GST on India's industrial growth.**

### **Introduction:**

GST the biggest tax reform in India founded on the notion of "one nation, one market, one tax completed a year on June 1 2018.

### **Body:**

Impact of GST on industrial growth

Simplified Transaction based Valuation: GST only considers transaction-based valuation. This makes way for easier tax calculation as well as fosters easy and simple compliance procedures.

No additional State Entry tax:

GST subsumes the entry tax for inter-state transfers. This will benefit consumers by reducing the cost of goods and services. Earlier, suppliers had to pay entry tax when the respective supplies crossed interstate borders. Entry tax changed with borders. This entry tax would trickle down to the end customer as an addition to the actual Selling Price of good. GST increases consumer benefits by eliminating such tax structures by bringing all states under a single unified tax umbrella.

Improved Cash Flows:

GST enables manufacturers to claim input tax rebate on goods. This facilitates continuous cash flow that indirectly drives growth. However, the time taken to credit input tax rebates to respective accounts must not be long enough so that it drives SMEs out of operations.

Single and Simple Registration Process:

Under the old regime, manufacturers needed to register for each and every manufacturing facility separately irrespective of the fact that they might be within the same state boundaries. GST eliminates this loophole. Now manufacturers need not register separately. Rather they need to do a single registration for all manufacturing entities within the same state. Of course, different state-entities will require separate registrations under GST too.

Cascade Effect Free Tax Structure:

Prior to GST, if you were a manufacturer, you were bombarded with a wide spectrum of tax. SMEs in manufacturing were subjected to Excise Duty of 12.5%; Central State Tax of 2% and at times 5.5% VAT was also levied. GST eliminates this cascading structure by fixing the GST rate at 18%. Also, GST facilitates claim of inter-state transaction taxes. All these enable manufacturers to lower the cost of production. Manufacturers can now pass on the benefits to consumers in the form of reduced prices.

Efficient supply chain:

In a first of its kind move, GST regime requires manufacturers to restructure their supply chain. Previously, supply chain was designed to escape Tax regimes. GST being a single tax regime force business to deploy supply chain structures that increase business and service efficiency. Supply Chain Systems will now be more efficient and put customer service on top priority.

GST was a complete overhaul of the existing system. The backbone of the new TAX System is the GSTN Network. The GST implementation is not an easy task and occasionally encounters technical glitches as well as taxpayer's grievances

1) Immediate Working Capital becomes a necessity for manufacturers under GST. Stock transfers are treated as supply and hence attract GST irrespective of advance or no payment. Following points further cement the above statement:

Interstate or intra-state stock transfers attract substantial Excise Duty on the removal of Goods

Branch transfers and depo transfers are taxable under IGST

Receipt of Advance is taxable as per GST rules

2) GST facilitates input tax credit and tries to minimize manufacturer tax burden. However, in order to increase TAX Compliance GST employs a very strict and tedious transaction

management system. Deploying an efficient transaction system requires a skilled workforce, additional resources. This puts an extra burden on manufacturers and other traders.

**Conclusion:**

GST is a welcome move by the Central Government for economic growth of India. GST also empowers people to be master of their destiny. Business leaders can now drive positive and impactful growth backed by transparent GST-compliance.

**Best Answer : Aniket Sachan**

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**8. Do you think the micro, small and medium industries hold the key to India's industrial growth? Examine.**

**Introduction:**

Micro, Small and Medium Enterprises (MSME) have been classified in accordance with the provisions of Micro, Small & Medium Enterprises Development (MSMED) Act, 2006 in two Classes: Manufacturing Enterprises defined in terms of investment in Plant & Machinery and Service Enterprises defined in terms of investment in equipment.

**Body:**

MSMEs hold the key to India's industrial growth:

- Share in manufacturing output- Around 45% of the manufacturing output is contributed by MSMEs, thus showing their immense potential in industrial growth.
- Employment generation- Unlike large industries, MSMEs provide employment to skilled as well as semi-skilled workers on formal and informal basis.
- Regional diversity- Owing to their small scale, these are ubiquitously present throughout the length and breadth of the country, thus reaping the full potential of our demography.
- Encourage innovation- Small investment encourages new-age entrepreneurs to create globally competitive business from India.
- Share in exports- About 40% of India's exports come from MSME sector. A boost to sector can thus boost overall exports.

- Utilization of local inputs- Under Make in India, indigenization is boosted and raw material and indigenous technologies are being utilized in manufacturing.

Despite the enormous potential, there are several factors that hinder the growth of this sector, like access to finances, access to markets, technology up gradation, ease of doing business, under-utilization of capacity and unorganized nature of employment.

### **Conclusion:**

Recent initiatives of government like 59 minute loan portal, SFURTI and ASPIRE are aimed at removing the hindrances in the growth of MSMEs. More still needs to be done to enhance the capabilities of the sector and make things easier to actually aid in India's industrial growth.

### **Best answer: Shri**

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## **9. What measures can be taken to make India the global manufacturing hub like China? Suggest.**

### **Introduction:**

In 1990 China produced less than 3% of global manufacturing output. China now produces almost half of the world's goods. The low cost of manufacturing in China played a huge role in making it the second largest economy. Now China is rapidly moving into medium to high-tech manufacturing as its labour costs have risen.

In such scenario, favourable demographic dividend over next 2-3 decades, availability of low cost labour and strong domestic market provides an opportunity for India to turn as a global manufacturing hub.

### **Body:**

Measures India can take to achieve this

Factor cost reforms

- Land reforms making it easier and affordable to acquire land.

- Capital: allowing greater flow of FDI to reduce cost of borrowing.
- Moving from over-protective to Flexible labour laws.
- Predictable tax regime.

#### Investment in infrastructure

- Well connected means of transport (road, rail, inland-waterway) to keep transportation cost minimum.
- Development of industrial corridors would attract setting up new industries.
- Adequate focus to ensure availability of hard and soft infrastructure (Power supply, credit flow, man power and other).

#### Business friendly ecosystem

- Doing away with obsolete and obstructing framework and bringing transparent and user friendly business environment.
- This involves comprehensive overhaul of outdated processes and policies. Examples: use of ICT in taxation system would reduce human interface; rent seeking behaviour; make process simpler thus reduce compliance cost.

Innovation: Innovation is necessary to come up with new technology, new products and new brands. Therefore Research and development needs to be given focus by bringing together scientists-research institutes-industries.

Need to strengthen patent regime.

Technology adoption: Need to support technology upgradation in MSME's. Harnessing new technologies like Artificial intelligence and making country part industrial revolution 4.0.

Policy support: Adequate measures to boost growth of MSME's. Need to strengthen traditional industries. Focus on food processing industries. Push to Set up Special Economic Zones and Coastal Economic Zones.

Need to simplify tax regime in the country.

#### **Conclusion:**

Given the potential of manufacturing sector and the need to shift workforce from primary sector, Government of India has come out with 'Make in India' initiative to make India global hub of manufacturing, research and innovation and integrate with global supply chain. Initiative should be followed with adequate policy measures to realise its objectives.

#### **Best answer: shri**

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## **10. What benefits would accrue from enhanced regional air connectivity? Discuss.**

### **Introduction:**

Connectivity is the corner stone of development. The government of India has launched schemes like UDAN to improve regional connectivity.

### **Body:**

Benefits from regional air connectivity:

- Development of small cities: It could lead to development of smaller cities as faster air connectivity will attract infrastructure & investment.
- Reduce the pressure from railways and roads
- Significant Social Benefits: Provides people with access to decent livelihoods, food, health care, education. Ex: Air transport is only means to travel to many remote places in North East.
- Economic benefits: It contributes 0.5% of Indian GDP supporting 1.7 million jobs directly and indirectly.
- Achieve sustainable development goal: Use of advanced fuel system would reduce pollution.
- Facilitate the delivery of emergency and humanitarian aid at time of disaster at inaccessible areas.

Challenges:

- Smaller players like Air Odisha and Air Deccan have struggled to raise sufficient capital for their operations, hire trained manpower and lease planes.
- Some airports owned by State governments and private players have been hesitant in participating as there is little for them to gain with RCS flights exempt from paying landing and parking charges and States required to provide land, security and fire services free of cost.
- Subsidy based regime are impacted by the vagaries of price changes in oil prices

### **Conclusion:**

Regional air connectivity has huge scope of developing tier1 and tier2 cities which can reduce the burden of big metropolitan cities. Thus scheme like UDAN need to be pursued relentlessly by engaging all the stakeholders

**Best Answer: Dazy Rani**

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**11. Air travel is giving stiff competition to the railways with aggressive pricing and quality service. What measures should the railways adopt to stay relevant? Suggest.**

**Introduction:**

Indian Railways, often described as the “transport lifeline of the nation”, is the fourth largest railway network in the world. In recent years there has been a decline in passenger growth in railways and a double-digit growth in air travel due to certain factors like narrowing fare gap between the two, time saving and the quality service in case of air travel.

**Body:**

Measures railways can adopt to stay relevant:

- Capacity augmentation- Too many trains run on the same stretch of lines, causing excessive wear and tear and delays. Railways should thus increase the number of tracks, convert narrow gauges to broad gauge to maintain uniform tracks, double, triple and quadruple the rail lines and maintain separate tracks for freight and passenger trains. Commissioning of dedicated freight corridors by 2020 will also help improve the capacity.
- Travel time- The gap in travel time between air and rail cannot be eliminated completely, it can however be reduced. One by increasing the average speed of trains and two by fitting the departure and arrival times within the window of 6 pm to 9 am so as not to eat into productive hours of the day.
- End cross subsidization- The lower-class passenger fares are being cross-subsidized on the behest of AC classes, thus increasing the fares of AC coaches. End of this subsidization can result in lower fares and thus competitive prices with airways.
- Wage costs- Most of the earnings of railways (62% in FY18) are spent on wages. This should be optimized so as to utilize the workforce well and reduce the costs.
- High-end technology- Bullet trains and Hyperloop can not only significantly reduce the travel time but also provide a qualitative experience to the user.

- Investments- Investment either by government or by private sector in various domains like infrastructure, safety requirements, qualitative services etc. needs to be pushed.
- Market-driven and customer centric- Railway tourism, holiday packages etc. can also help railways in making its mark.

### **Conclusion:**

Railways cannot beat the speed and efficiency of air travel, but with above-mentioned measures it can definitely give it a tough competition and maintain its own niche, so as to ultimately benefit the consumer by giving them multiple transportation options.

### **Best answer: SID**

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## **12. Enhancing the border road infrastructure has its economic and strategic advantages for India. How? Examine.**

### **Introduction**

India is a unique country with ~15000 km land border sharing with seven countries. This length of border is comprised of unique topography, culture and varied socio-economic challenges. Considering unity of the nation and neighbourhood first policy of India, it is imperative to develop modern and competitive border road infrastructure.

### **Body:**

Economic Advantages of border road infrastructure:

- One of the most important advantages is development of legal and amicable trade relations with neighbouring countries. Examples of it are trade through Attari-Wagha border and Border Haats with Bangladesh and many more with Nepal, Bhutan, etc.
- Proper border road infra will reduce trafficking and smuggling, which is currently a big cause concern for India and neighbouring countries.
- Recently, World Bank has released a report called "A Glass Half Full: The Promise of Regional Trade in South Asia". According to its findings intra-regional trade accounts for a little more than 5 percent of South Asia's total trade while it accounts for 50



percent of total trade in East Asia. It means there is huge untapped regional trade potential in South Asia, where most of the countries share borders with India.

- Another major economic benefit is inclusive growth and development. Border road infrastructure, especially in harsh terrains such as northeast and Jammu & Kashmir provides avenue for self-employment and boost to traditional small scale Industries.
- Furthermore, tourism in beautiful and lofty Himalayas has not reached to its full potential due to improper road infrastructure. To tap full potential of natural tourism avenues we must further improve our border road infra.

Strategic Advantages of border road infrastructure:

- One of the major advantages is that through border road infra India will be successful in pushing for her ambitious neighbourhood first and act east policies. It will act as soft power in terms of creating people to people contacts. Best example of this is the most recent project of Kartarpur Corridor.
- Border road infra helps in maintaining peace and stability by controlling the security concerns related to inter-region and intra-region issues.
- The task of national integration which started with independence of India and still going on will be incomplete without border road infra. Connectivity and inclusivity are the important tools for national integration of far-flung areas such as North eastern states and Ladakh, etc.
- Economic avenues provided by such infra definitely leads to strategic benefits within and outside country to control menace of terrorism and secessionists' activities.
- Another important advantage of border roads is in proper and swift disaster management. Difficult and harsh terrains of Indian borders and relatively low development of bordering countries make it inevitable for India to prepared and self-sufficient to handle any kind of disasters.

Challenges ahead:

- Rough and difficult terrain
- Weather and Climatic conditions
- Seismically active areas in most of the border
- Cease fire violation and border intrusions
- Inadequate manpower, funds with Border Road organisation (BRO)
- Redtapism and bureaucratic delays in projects

### **Conclusion:**

BRO has been frequently in news due to delays and other lacunae with regard to border road infra.

Proper and defined autonomy with respect to 3F: Funds, Functions and Functionaries will help to boost the rapid development of border road infra, ultimately leading to economically integrated and strategically amiable South Asia.

**Best Answer: YBB**

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### **13. Examine the potential of inland water transportation in India.**

#### **Introduction:**

Inland Waterways Transport (IWT) is a method of transporting cargo over rivers, backwaters, canals, and creeks.

It provides a cost-effective, logistically efficient and environment-friendly mode of transport and whose development as a supplementary mode would enable diversion of traffic from over-congested roads and railways.

#### **Body:**

India has nearly 14,500 km of navigable waterways. However, IWT accounts for less than 1% of its freight traffic. Developing IWT will lead to following Potential benefits

Industries:

- Bring down logistics cost thus increasing competitiveness of industries.
- Dispersal of industries along waterways leading to employment generation thus promoting balanced regional development.
- Fillip to ship building industry.
- Boost to Tourism sector.
- Enhanced connectivity with neighbouring countries like Bangladesh will boost trade and commerce between nations. Within India, it will boost the maritime trade of the Indian states and augment their economies.

Towards Green economy:

- Comparatively less polluting: CO2 emissions are from container vessels range much lesser than road transport vehicles.

- Diversion of traffic from road and rail.

Their development will lead to the development of integrated transportation sector (rail, road, water) thus connecting ports, major cities with remote areas.

Their economic importance will lead to better management of inland water resources.

As the acquisition of land for national and State highways becomes scarce and the cost of construction of roads, flyovers and bridges goes up, inland waterways provide better alternative to the government as a means of public transportation.

However, following challenges exist in their development.

- There is seasonal fall in water levels particularly rain-fed rivers of peninsular India which are almost dry during summer.
- Less flow of water due to diversion of water for irrigation. Hard for even steamboats to sail. Example: Ganga.
- Reduced navigability due to siltation, waterfalls and cataracts in rivers and salinity in coastal rivers.
- Dredging carried out to maintain minimum depth of water may negatively affect aquatic ecosystem, entry of saline water into creeks in coastal areas.
- Lack of Public Funds: The financing requirement for NWs is huge and open-ended. Heavy investment will be needed to procure equipment, including dredgers, shipping vessels, and barges of different sizes.
- Disinterest by Private Players: Even after liberalisation and economic reforms, there has been very less active participation from private players in this sector.

### **Conclusion:**

Given such benefits IWT brings, Government of India Under the National Waterways Act, 2016, 111 inland waterways have been declared as National Waterways (NWs) in addition to the five existing NWs, across 24 States for utilizing them as an environment friendly and sustainable mode of transport. The Jal Marg Vikas Project has been commissioned for capacity augmentation of NW-1 (river Ganga) from Haldia to Varanasi with an objective to facilitate movement of 1,500 – 2,000tonne vessels.

Such a holistic and concerted effort can change India's transportation landscape, have multiplier effect on economy, de-congest arterial roads, and even improve quality of life across geographies.

**Best answer: Sharath Yerrapothu**

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#### **14. Discuss the significance of ports in India's trade promotion.**

##### **Introduction:**

With around 7500km long coastline and constrain of overland movement in other side, the port led trading become more significant in India's case. India coastline supports 13 major and 200 minor ports. According to ministry of shipping, the waterway trade covers 95% of India's total trade by volume and 70% by value, making it way forward than other mode of transport. The ports open the India's channel across the globe and counteract the numerous barriers it face in land based trading.

##### **Body:**

Major significance of ports in trade promotion

- Acts as important link to hinterland and overseas.
- It also facilitates goods movement through export and import thus leads to increased consumer choice and provision of goods at competitive price.
- Reduction in cost of transportation i.e. almost one tenth of air
- Enhancement to blue economy through fishing, tourism and passenger transport
- It is also significant for internal trade by providing livelihood to local community, multi modal connectivity by rail, roads and waterways and faster and inclusive approach in goods movement
- Less ecological impact

However, to completely utilise the potential of ports, the government need to overcome few challenges like;

- 1) Inadequate infrastructure and poor connectivity with hinterland.
- 2) Slow turn-around time.
- 3) Red-tape and excessive interference from authority.
- 4) Huge environmental cost and affecting coastal population.
- 5) Lack of proper man power and training expertise.
- 6) Poor maintenance of port infrastructure.

7) Out-dated navigation and IT tools.

The government, in order to overcome the challenges has taken few steps such as:

1) Sagarmala project- The objectives of this project are port modernisation and new port development, port connectivity enhancement, port-linked industrialisation and coastal community development.

2) Central port authority act, 2016- to provide more autonomy to port and professionalise the governance structure.

3) Revised Model concession agreement- to provide private sector participation in port development and management.

4) Allowing 100% FDI under automatic route in port development.

### **Conclusion:**

The waterway is the cheapest mode of transport, harnessing it to the utmost level will gradually lower the operational cost of trade. It will make Indian trade more competitive and hence indirectly promote employment and growth

### **Best answer: Dazy Rani**

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## **15. What do you understand by command area? How do command area development plans aid in increasing agricultural productivity? Analyse.**

### **Introduction:**

Command Area refers to the area whose water needs are fulfilled by a water body/basin project e.g.: River Ganga's command area spans across 5 states of Uttarakhand, UP, Bihar, Jharkhand & West Bengal. It includes the area which is otherwise uncultivable.

Command area development plan was in 1974-75 to narrow the gap between irrigation potential created and actually utilised in major and medium irrigation schemes.

### **Body:**

Initially, 60 major and medium projects were taken, covering a cultivable command area of 15 million hectares. Till now 314 projects with a cultivable command area of 28.95 million have been taken. From eleventh five-year plan onwards, scheme was implemented as a state sector scheme.

Plan had provided various components –

- Construction of field channels and field drains
- Land shaping.
- Introduction of rotational supply of water
- Role in increasing agricultural productivity:

It increased the Irrigation Potential created in the country, thereby providing assured irrigation facilities to farmers, improving farm resilience to weather vagaries.

- By making multiple cropping cycles feasible within the same calendar year.
- By making mixed farming feasible.
- By making commercial farming of cash crops and “high value, low volume” crops (such as horticultural crops) a feasible option for farmers.
- Helped in conservation of water. It helped in making green revolution successful because high yielding variety seeds and fertilizers need the irrigation on time.
- Crop failure became a rare phenomenon.

But command area programme also led to many problems like

- 1) High cost.
- 2) Limited participation of farmers in designing projects.

### **Conclusion:**

However, Command Area Development Program in India has had limited success because of its excessive focus on large river valley projects, instead of micro-watersheds. Recent parliamentary standing report shows that less than 10 percent irrigation projects have completed

In order to make efficient implementation of plan it is required to make technology sustainable and make farmers aware of its benefits. A policy shift is necessary in this regard to double the farmers' income by 2022.

**Best answer: John Nash**

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## **16. Innovations in the field of infotech and biotech hold the potential to transform the agricultural landscape. Comment.**

### **Introduction:**

Agriculture employs almost half of the population but cannot guarantee a sustainable livelihood. Technological innovations in information and biology can help alter the above scenario and transform the agricultural landscape.

### **Body:**

Potential of Infotech:

- Artificial Intelligence- Use of automated agricultural vehicles will maximize their efficiency and capacity.
- Automated equipment- automatic watering and irrigation systems, precision agriculture etc. can help ease the way of practicing agriculture and reduce the labour input for the same.
- Block-chain technology- Block-chain can be used for agricultural trading and selling, decentralized transactions and self-executing smart contracts as well as for resource management, like tracking machinery maintenance records or for tracking other sensors and equipment.
- Cloud based solutions- help companies remotely monitor farms, interact with farmers and make every crop transparent and traceable. It also aids farmers in adopting global agricultural practices and improves productivity by offering productivity insights and harvest forecasts.
- IT based network integrators- These technological platforms offer a range of services to farmers in rural areas including financial, agricultural inputs and government assistance.
- Mobile technology- Apps like Trringo have brought revolution in farm equipment renting process in India.
- Virtual aggregators- Farmers can use the mobile platform for aggregation, and then leverage the volume to negotiate better prices with suppliers.

Potential of Biotech:

- Genetic editing- Engineering crops that require less water and that grow more food, and use of CRISPR/CAS9 to change a cow's gut microbes to try and reduce the

amount of methane they are producing as well as how large they get are few examples of gene modification.

- High yielding crops- Use of biotechnology can result in high yielding varieties of crops thus improving crop productivity.
- Tissue Culture- It is the science of cultivating animal/ plant tissue in a prepared medium. Technologies based on this can be harnessed to achieve crop improvement objectives.
- Bio fertilisers- micro-organisms and minute plants which can absorb gaseous nitrogen and phosphorous directly from the atmosphere and make it available to the plants can be identified, multiplied in the laboratories and introduced into the root zone of crop plants to supply nitrogen and phosphorous.
- Improved value- Biotechnology can help enhance flavour and nutritional value of the crop while also increasing its shelf life.

### **Conclusion:**

Write a brief conclusion

### **Best answer: Gargi gupta**

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## **17. What is precision agriculture? What are its advantages? Discuss.**

### **Introduction:**

Precision agriculture seeks to use new technologies to increase crop yields and profitability while lowering the levels of traditional inputs needed to grow crops (land, water, fertilizer, herbicides and insecticides). In other words, farmers utilizing precision agriculture are using less to grow more.

Precision Agriculture is a concept which needs implementation through ICTs, Wireless Sensor Networks, Geospatial methods and automated positioning systems.

### **Body:**

Need of precision agriculture in India



There is a need to increase output per hectare in India as it is low compared to other countries. One of the reasons for the low output is lack of access to modern technology.

There is a need for judicious use of water, energy and efficient use of various inputs like seeds to enhance productivity.

As India takes rapid strides to enhance access to digital tools, it is an opportune moment to think of ways in which the rural areas and farmers can benefit from the digital revolution.

The next big step we have to take is to link the leap forward in agricultural productivity with digital applications and technological innovations.

#### Advantages of Precision agriculture

- Precision agriculture seeks to make agriculture remunerative even to small and marginal farmers by reducing the cost of cultivation and enhancing yields.
- Precision Agriculture or site specific crop management is the key to optimally manage the resources for a better yield, reducing pollution and saving environment.
- This capability could be used for the benefit of farming sector for assessing land and crop health; extent, type and severity of damage besides issuing forewarning, post-event management and settlement of compensation under crop insurance schemes.
- Research by an organization involved in precision agriculture has showed that mobile-based agricultural extension system among farmers in Gujarat had resulted in increase in each farmer getting Rs. 7,000 more per year, while the yields went up by 8.6 per cent for cotton and 28 per cent for cumin.
- Technologies facilitate to give each plant exactly what it needs to grow optimally, with the aim to improve the agronomic output while reducing the input. This means producing 'more with less', which coincides with our 2nd Green Revolution concept of 'more crop per drop'.

#### Precision farming in India

- Some of the schemes like PMKSY's (Per Drop More Crop) involve Precision Agriculture practices.
- The Indian Council of Agricultural Research (ICAR) and the Indian Agricultural Research Institute (IARI) has formulated a project entitled "SENSAGRI: SENsor based Smart AGRiculture".
- The major objective is to develop indigenous prototype for drone based crop and soil health monitoring system using hyperspectral remote sensing (HRS) sensors.
- Drone technology is also being used. It has ability for smooth scouting over farm fields, gathering precise information and transmitting the data on real time basis.
- Mobile apps are being used to provide farmers with weather information and provide early warning.

A pilot project

KISAN+ (Crop Insurance using Space technology geo-informatics); The programme envisages use of high resolution remote sensing data (from Indian and International Satellites), sophisticated modelling activity and other geospatial technology (smart phone, Global Positioning System (GPS), Bhuvan Server) for improving the accuracy of crop yield estimation through more efficient Crop Cutting Experiments.

**Conclusion:**

The need of the hour is to adopt state of the art technology to make agriculture sustainable and profitable.

Agricultural renaissance can take shape on a strong digital foundation.

Adoption of technology will help in sustaining food security and enhanced livelihood opportunities.

In addition, the farming community needs to diversify and take up allied activities like fisheries, dairy and poultry as well to double the on-farm incomes.

**Best Answer: SID**

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**Dazy Rani**

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**18. What in your opinion are the deficiencies in India's MSP regime? Analyse.**

**Introduction:**

The minimum support prices (MSP) are announced by the Government of India at the beginning of the sowing season for certain crops based on the recommendations of CACP.

The idea behind MSP is to

- Give guaranteed price and assured market to the farmers and protect them from the price fluctuations and market imperfections.
- The guaranteed price and assured market are expected to encourage higher investment and in adoption of modern farming practices.
- Further, with the globalization resulting in freer trade in agricultural commodities, it is very important to protect the farmers and their interest.

Body:

Deficiencies in India's MSP regime

- Incentivised cereal centric production has distorted cropping pattern affecting crop diversification. Situation results in lower production of other crops. Example: import of pulses.
- Un-sustained agricultural practices: Cultivation of water intensive crops like Rice-Wheat in unsuitable agro-climatic conditions has resulted in over-exploitation of ground water.
- Though fixed for 23 crops, in practice, the remaining 20 agro commodities do not derive any benefit.
- It is criticised that MSP calculation formula do not really reflect actual cost of production.
- Challenges relating to information dissemination: NSSO study has pointed out that it has mostly benefited large farmers while 70% of farmers remain unaware about MSP.
- MSP has turned out as a Political tool. While Global commodity prices are falling, In India downward revision under MSP policy is inconceivable.
- Averaging out the cost of production in different agro-climatic conditions, varied yields and cost indices of 26 states is a questionable exercise for the determination of MSP.
- Inadequate infrastructure to store procured grains results into wastage.
- MSP Procurement is almost nil in eastern states.

Suggestions to improve:

- First and foremost, the awareness among the farmers needs to be increased and the information should be timely disseminated till the lowest level so that the knowledge would increase the bargaining power of the farmers.
- Delays in MSP payments have negative effects on the framers so need to be corrected and timely payment should be ensured.
- As intended by the policy makers, MSP should be announced well in advance of the sowing season so as to enable the farmers to plan their cropping.

- Improved facilities at procurement centres, such as drying yards, weighing bridges etc. should be provided to the farmers. More godawn should be set up and maintained properly for better storage and reduction of wastage.
- There should be meaningful consultations with the State Government, both on the methodology of computation of MSP as well as on the implementation mechanism.
- The criteria for fixing MSP should be current year's data and based on more meaningful criteria rather than the historical costs.
- The small and marginal farmers can be provided with some exemption in Fair Average Quality (FAQ) norms to provide them with a source of income.
- The Procurement Centres should be in the village itself to avoid transportation costs.
- The MSP scheme requires a complete overhaul in those States where the impact of the scheme ranges from 'nil' to 'at-best marginal' to ensure that MSP as an important instrument of the Government's agricultural price policy is not undermined. In fact, in a few selected States in Eastern India (for instance, Assam and West Bengal), the poor impact of the scheme may be judged by the fact that none of the selected farmers were even aware of the existence of such a Scheme.

### **Conclusion:**

Along with MSP we need a robust procurement system, appropriate foreign trade (export/import) policy and tariff (Customs duty) policy in a way that will protect domestic growers without compromising the interests of consumers with simultaneous focus on crop-neutral initiatives that seek to build lasting assets as well as scientific post-harvest systems to help farmers.

### **Best answer: Sk**

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## **19. Do agricultural subsidies have a distorting effect in free markets? Illustrate.**

### **Introduction:**

Agricultural subsidies is a fractional amount of government incentives paid to farmers, agribusinesses in order to supplement their income, manage the supply of agricultural commodities and influence the cost and supply of such commodities.

WTO provides three types of subsidies in which Amber box subsidy is most trade distorting while other two – green box and blue box are not.

## Body:

Though it is a good measure to address the plight of the farmers, it can also have an adverse effect in the free markets, which can be highlighted as follows-

- 1) Subsidies directed by the United States government, particularly to corn farmers, can have a spill over affect in developing countries like India. Subsidies granted to the farmers of developed countries are way higher than that given to Indian farmers, thus it can cause distortion to the domestic market of domestic markets as well.
- 2) Fertilizers subsidy, as an input for agriculture production, is responsible for rampant use of fertilizers, commonly the triad NPK, in India. This acts as a barrier for entry to the developed market like European Union who held that India's agricultural products are not up to the mark of WTO's phytosanitary measures.
- 3) While the developing countries like India and China are not in an affordable position to breach the de-minimus level of Aggregate measures of support(AMS), developed countries like US provides subsidies exceeding 50% in some products such as Canola, cotton, sugar and more than 200% for wool.

Most benefits of subsidies are allotted to big farmers while In India, 2/3 Rs farmers are marginal farmers which can't utilize the benefit of subsidy properly. Thus value of produce of such farmers decrease.

It leads to overproduction of one crop (grains) over other (like fruit, pulses). Thus sometimes grains are piled up for rotting in warehouse. Also in market, the trade of such cereals take place on the expanse of other non- subsidised products.

Example: The recent trade war between United and China is also the political consequences of the ill effects of subsidies, provided by a particular nation haphazardly. Therefore, complete compliances with the WTO mandated de-minimus level for both developed and developing countries need to be adhered to by parties.

## Conclusion:

However, agricultural subsidies are necessary to the extent that they secure the interests of the farmer, the consumer, the nation and the environment. As such, rationalizing agricultural subsidies to secure this delicate balance ought to be an ongoing exercise. The recent steps like Rythu Bandhu scheme of Telangana and KALIA scheme of Odisha in this regard are good measures.

## Best answer: Being better

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## **20. How can revamping the PDS in India ensure food security? What measures should be taken in this direction? Suggest.**

### **Introduction:**

The Public Distribution System contributes significantly in the provision of food security. Public Distribution System in the country enables the supply of food grains to the poor at a subsidized price. It also helps to control open – market prices for commodities that are distributed through the system.

### **Body:**

Issues associated with PDS

- 1) Identification of Beneficiaries: Studies have shown that targeting mechanisms such as TPDS are prone to large inclusion and exclusion errors.
- 2) Rising Food Subsidy: The cost of handling food grains (MSP and other costs) has increased due to rising costs of production and increasing costs for handling and distributing food grains. The cost of producing rice and wheat has gone up primarily due to sharply rising input costs such as labour and energy costs, including fertilisers.
- 3) Leakage of Food grains: There is high degree of leakage in PDS scheme at ration shops and during transportation of food grains.

Revamping PDS would ensure that

- Coverage of 75% of the rural population and 50% of the urban population for receiving food grains (rice, wheat & coarse grains) at highly subsidized rates i.e. Rs. 3/2/1 per kg respectively.
- Use of technology will ensure the inclusion and exclusion errors are less.
- Can ensure that poor are not only food secure but nutrition secure which in turn will help India achieve SDG goals.

Measures to improve and revamp PDS:

- 1) Ensure community participation along with use of technology: Odisha, Tamil Nadu, Rajasthan, Chhattisgarh, Madhya Pradesh, Telangana and Gujarat have intensified reforms in PDS using latest technology and ensuring community participation—they have taken steps such as computerisation of offtake of grains, recording of procurement, storage and distribution, installation of electronic point of sale machines in fair price shops, and regular monitoring at every stage. The digitisation of beneficiaries' database and verification of their identities through Aadhaar have resulted in scraping of over 23 million fake ration cards and

savings of Rs 14,000 crore of annual food subsidy. This approach can be extended now to Pan India.

2) Density of fair price shops need to be increased: Efforts need to be made to open shops in remote location.

3) Minimise wastage loss: Continued research and improvements in logistics throughout the distribution chain is imperative.

4) Diversification of food choices: Bio fortified food, if distributed, can help in addressing recalcitrant micronutrient deficiencies such as vitamin A and anaemia. States can provide necessary nutrients such as pulses and millets to women along with grains and possibly promote dietary diversification as per the culture, tastes and preferences of people-this will also ensure the success of NNM mission

5) Universal PDS which ensures food grains at subsidised price like in state of Tamilnadu can also ensure reduction in Ghost beneficiaries.

6) Doorstep delivery as implemented by Delhi government can be extended in extremely backward districts which will ensure that no death occurs due to malnutrition

7) Other alternatives like cash coupons and food coupons can also be explored.

8) Recommendation of Shanta Kumar committee needs to be implemented.

### **Conclusion:**

PDS need to be revamped and drawbacks in its implementation removed to ensure food security for all and to help India achieve its SDG goals.

## **21. What are technology missions? What do these missions try to achieve? Explain.**

### **Introduction:**

Technology Mission generally implies that projects have clearly defined objectives, scopes, and implementation timelines. They have measurable outcomes and service levels with the help of technology advancements in particular assigned sector. The "Technology Missions" are the brainchild of Mr. Rajiv Gandhi, started in 1987.

### **Body:**

The mission was started as an offshoot of the Seventh Plan in the fields of literacy, immunization, oilseeds, drinking water, dairy products and telecommunication. Subsequently, pulses, oil palm and maize were also brought within the purview of the

Mission in 1990-91, 1992 and 1995-96 respectively. These missions are funded jointly by Centre and State Govt. and other allied institutions.

Objectives of the mission:

- Drinking water- Improve the availability and quality of drinking water in rural areas. There have been substantive efforts like using geo-hydrological mapping, to determine where to drill new wells, increasing water sources and making accessible clean water to villages.
- Literacy- Make substantial improvement in the functional literacy of the population. The mission had the dual focus of motivating people (adults in particular) to learn, and providing materials and teachers. The Digital Saksharta Abhiyan (DISHA) or National Digital Literacy Mission (NDLM) Scheme has been formulated to impart IT training.
- Immunization- Immunize all infants against six diseases and women against tetanus. With consistent efforts over years India was declared polio-free in 2013
- Dairy production- The goal of the dairy mission was to develop and implement technologies to improve breeding, animal health, and fodder and milk production. Today, India is the number one producer of milk in the world.
- Telecommunication- Extend and improve the telecommunication network especially in rural areas. BharatNet has been laid down and other efforts are also yielding results through indigenous development, local young talent, rural telecom, digital switching networks, local manufacturing and privatization.
- Agriculture and Horticulture- To improve overall agricultural production and holistic development of agriculture. National Mission on Sustainable agriculture, National Mission for Integrated Development of Horticulture and Horticulture Mission for North East and Himalayan States are launched.
- Other technology missions like on Railways, Nano technology, technical textiles etc. have also been launched.

These missions have transformed the socio-economic parameters of India, but there are still challenges like slow pace of implementation, bureaucratic hurdles and lack of clarity on missions on stakeholders etc., which need to be addressed soon.

### **Conclusion:**

Write a brief conclusion

**Best answer: Arvind Senta**

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## **22. What significance do livestock hold for an average distressed farmer in India? Illustrate.**

### **Introduction:**

Agriculture is one of the important sectors of Indian economy with about 50% of population depending on it for their source of income. Despite its significance, it is most suffering sector in terms of crop loss and market turbulences.

### **Body:**

Cry of Distress:

NSSO Situation Assessment Survey of Agricultural Households (2013) shows 52% of farming households are indebted, with rates as high as 89-92% in some States.

The distress is mainly due to lack of compensation during drought and disasters, the failures of the crop insurance scheme, and the deficit due to prices falling below the announced Minimum Support Prices.

Diversification of sources of income for farmers is one of the few suggested solutions. Here, livestock plays an important role for a distress farmer.

Significance of livestock:

Livestock are domesticated animals raised in an agricultural setting to produce labour and commodities such as meat, eggs, milk, fur, leather, and wool. The term is sometimes used to refer solely to those that are bred for consumption, while other times it refers only to farmed ruminants, such as cattle and goats.

- **Labour:** A distress farmer cannot afford mechanised farming. For him cattle provide the service of labour. They help in very crude form of mechanised farming for small and marginal farmers.
- **Reliable source of income:** Unlike farm crops, livestock do not easily suffer from monsoon failure or such other natural calamity. They continue to provide milk, eggs, etc. in almost all weather conditions. Every part of livestock carries economic importance such as leather, wool, meat, etc.

- Reduces input cost: Dung and other remnants of livestock act as green manure, a substitute to fertilisers. They also help in weed control without using chemicals or others costly and hazardous methods.
- An asset: Livestock are important asset for a distress farmer which can be encashed at any moment and may help him to come out of debt trap.
- Nutritional security: For a distressed farmer's family, food provided by livestock is the only source of nutrition required for survival.

The livestock sector can offer significant opportunities for bolstering non-farm income. Though there are many steps taken by government such as bovine dairy development programs and GOBARDHAN program etc., but there are challenges which need to be addressed to make it more productive.

#### **Way forward:**

- A national breeding policy is needed to upgrade the best performing indigenous breeds.
- Buffalo breeding ought to be given more attention, while poultry breeding should be focused on conservation.
- State governments should be encouraged to participate in national breeding policy implementation. Geographical information system-based analysis must be utilised to map production systems.
- Animal health care should become a priority, with greater investment in preventive health care.
- Private investment must also be encouraged. The government needs to create better incentive structures for investment in livestock.
- State governments should sponsor research and assessment of the market, along with highlighting investment potential.

#### **Best Answer: Sreelakshmy vijayan uma**

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**23. Comment upon the evolving trends in the FMCG sector in India. Does this sector need a better regulatory regime? Examine.**

#### **Introduction:**

Fast-Moving Consumer Goods (FMCG) or Consumer Packaged Goods (CPG) are products that are sold quickly and at a relatively low cost. Examples include non-durable goods such as packaged foods, beverages, toiletries, over-the-counter drugs and medicines, and other consumables.

FMCG in Agricultural products:

Various food products and beverages derive their raw material from agricultural produce, such as bread packets, Maggie and cornflakes, wafers, various sauces, etc.

These are very rapidly increasing in India.

FMCG sector in India

- Fast moving consumer goods (FMCG) are the 4th largest sector in the Indian economy.
- Out of three main segments of FMCG sector i.e. healthcare, household and personal care, and food and beverages, last one accounts for 19% of the sector.
- Considering the size of agriculture sector in India, there is huge unexplored potential for FMCG in agriculture sector.
- India's contribution to global consumption is expected to get double to 5.8 % by 2020 due various factors such as increasing disposable income, higher demand especially rural areas, etc.

Potential for Agricultural FMCG in India:

100% FDI is permitted in single brand retail, domestic and international companies in FMCG. It is great opportunity to explore innovative production and processing such as paper pulp, sugar products, fermentation, food processing (dried fruits and vegetables, jams and sauces), vegetable oils and vanaspathi, soaps, cosmetics and toiletries industries, etc.

About 50% of India's workforce is employed in agriculture sector. There is huge manpower available to harness processing potential of agriculture.

Issues in FMCG sector in India:

- One of the major issues is lax regulation. There is huge potential for food processing in every household, especially of rural India. But lack of awareness, lack of scientific preservation techniques, and absence of feedback or recall mechanism hampers the growth of this potential on large scale.
- Due to above shortcomings the huge global market remains unexplored.
- Indian food products, due to their spicy tastes, are in high demand overseas. But domestically this sector remains unconsolidated and unregulated.
- Other issues include adulteration and poor packaging, etc.

- Need of regulatory regime in FMCG: Though FSSAI is regulating and monitoring food products, but still there are large numbers of unique homemade snacks and wafers which if brought under regulatory ambit, will contribute more to household income as well as revenue to country.

FMCG, especially in agricultural produce, forms part of small and medium scale industry. The MSMEs are one of the largest employers in India.

Proper regulation of the sector will help MSMEs to grow and ultimately prosperity of households will be achieved.

Self Help groups are another important group in food processing, regulatory regime is most needed to these groups.

Environmental concerns and health concerns due to cheap packaging or adulteration etc are also demanding proper regulation of FMCGs.

Food continues to be one of the most underpenetrated segment for organised FMCG players and the food industry in particular, and is likely to be benefited as Agricultural Produce Market Committee (APMC) reforms continue, and food safety regulations are secularly implemented.

### **Conclusion:**

Considering the rapidly growing domestic and global consumer market, there is huge potential for India to target doubling of farmers' income by 2022 with the help of FMCGs. For it we need skill development, innovative environment and a strong regulatory regime.

### **Best Answer: Shri**

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**24. Do you think the food processing industry has enough potential to create jobs for the burgeoning labour force in India? Critically comment.**

### **Introduction:**

India's food processing sector continues to grow in response to changing demographics, evolving preferences for branded and convenient items, retail and food service sector modernization, and government efforts to develop food manufacturing.

**Body:**

The food processing industry is a key contributor to employment generation in India. By 2024, food processing sector is expected to employ 9 million people in India and expected to generate about 8,000 direct and 80,000 indirect jobs in the state, the ASSOCHAM-Grant Thornton joint study on 'Food Retail: Investment: Infrastructure' noted.

As the consumers in the country are becoming more health-conscious, the demand for nutritious food is growing proportionately. In addition, rising number of working women and nuclear families is resulting in high demand for ready-to-eat and frozen food. Thus, overall India's food value chain is poised to create multiple opportunities for investment and employment in storage infrastructure, farming, retail and quality control.

It is estimated that Indian food processing industry is pegged close to US\$ 121 billion to US\$ 130 billion.

With the second largest arable land in the world, it is the largest producer of milk, pulses, sugarcane and tea in the world and the second largest producer of wheat, rice, fruits and vegetables.

Despite the massive production, the degree of processing is low and ranges between 2-35% for different produce.

India is one of the top rankers in the production of bananas, guavas, ginger, papaya etc although processing levels in the country remain limited, which indicates an extensive opportunity in the food processing sector.

Indian food and retail market is projected to touch US\$ 482 billion by FY 2020 from the current level of US\$ 258 billion in 2015.

Employment areas: Farm related employment in agricultural sector (Allied activities like dairying), self-employment opportunities particularly to women, development and management of infrastructural facilities like storage and processing centres, transportation network, research and innovation to add value to the product and others.

Though India ranks first in production of milk, pulses and tea and second in production of fruits and vegetables, its share in the world food trade is less than two per cent. Thus the policymakers have identified food processing as a key sector in encouraging labour movement from agriculture to manufacturing.

Government of India has come out with SAMPADA scheme to give boost to Food Processing Industry in the country. To reduce post-harvest losses of fruits and vegetables, Government plans to set up 500 cold chain projects in the country.

**Conclusion:**

However, in order to achieve job creation potential, several issues that plague food processing industry like In-adequate infrastructural facilities, Poor quality and hygiene norms, need for greater investment and access to global market, Research and innovation in the sector require attention.

**Best answer: Dazy Rani**

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**25. What do understand by backward and forward integration? Illustrate with respect to the food processing industry.**

**Introduction:**

Food processing is the transformation of raw ingredients into food, or of food into other forms (ie. food processing may denote direct manufacturing of food or value addition on existing food). Food processing typically takes harvested crops or butchered animal products and uses these to produce long shelf-life food products.

**Body:**

Forward linkage integration refers to consolidating the chain from processing industries to market while backward market integration refers to consolidating chains from farm to processing centres and to integration with ancillary industries.

Example of forward linkage integration

- Reduction of intermediaries by wholesale marketing or e-marketing or supermarkets etc.
- Provision of chilling infrastructure, transportation infrastructure etc.
- Provision of testing and standardisation facility to grade final product.

Examples of backward linkage integration:

- Development of infrastructure like road to transport farm produce to processing centres.
- Land consolidation and contract farming to ensure steady availability of surplus marketable produce.
- Availability of proper marketing infrastructure for farmers to realize fair price for their produce for. To preserve the raw materials for longer durations.

Integration of forward and backwards linkages is extremely vital for the success of food processing sector.

Benefits of backward linkage and forward linkage for food processing industries

- Reduces food inflation
- Preventing wastage of ones third of food

For e.g. Pepsi collaborated with Punjab for orange procurement

However various challenges still remain owing to lack of infrastructure, large no. of intermediaries, lack of testing and grading facility and land reform issues which need to be overcome to reap the anticipated benefits of FPI in terms of improved efficiency of food supply chain and employment generation (and thereby reaping our demographic dividend).

### **Conclusion:**

Food processing industries are sunrise industries which have potential to grow from present 2% of GDP to optimising high output of farming sector. Government introduced PM krishi sampada scheme, mega food park scheme etc. to address a plethora of these issues.

**Best answer: shri**

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## **26. What are the challenges of supply chain management of food products in India?**

**Analyse.**

### **Introduction:**

An agriculture supply chain system comprises organizations/cooperatives that are responsible for the production and distribution of vegetable/Fruits/Cereals/Pulses or animal-based products.

### **Body:**

## Challenges of Supply Chain Management

- Connectivity: There is lack of connectivity from villages to markets
- Sorting and Grading technology: Farmers lack the knowledge about the process
- Numerous stake holders working in isolation: The food supply chain is complex with perishable goods and numerous small stake holders. In India, the infrastructure connecting these partners is very weak.
- Lack of demand estimation: Demand forecasting is totally absent and the farmers try to push whatever they produce into the market.
- Lack of technology applications: Cold chain logistic supply chains should take advantage of technology improvements in data capture and processing, product tracking and tracing, synchronized freight transport transmit times for time compression along the supply chain and supply-demand matching.
- Lack of system integration: The supply chain needs to be designed and built as a whole in an integrated manner. The process of new product development, procurement and order to delivery processes should be well designed and well supported with the help of IT tools and software.
- Presence of large number of unorganized retailers: At present the unorganized retailers are linked with farmers through wholesalers or commission agents. The commission agents and wholesalers redundant supply chain practices make unorganized further inefficient.

## Ways through which Supply chain management can be improved

- Improving infrastructure through schemes like Aajeevika Grameen Express yojana, SAMPADA yojana (building warehouses)
- Vertical coordination of farmers through cooperatives, contract farming and retail chains would facilitate better delivery of output, reduce market risks, provide better infrastructure, attract more public interest, acquire better extension services, and create awareness regarding the prevailing and new technologies.
- Customized logistics is another important immediate requirement to make logistic effective. This reduces the cost, facilitates maintenance of quality of the produce and fulfils requirements of targeted customers.
- Information system for better coordination among different stakeholders from farmers to consumers is the need of the hour. The internet and mobile communication can also be used to enable information and financial transfer between the stakeholders.
- Public private partnership is another strategic solution. Supply chain like washing, waxing, grading, sorting, packing, pre-cooling, handling facilities, insurance, finance, transport and processing facilities would add value to supply chain functioning.
- Establishment of Mega Food parks: These parks will also provide the required infrastructural and common facilities which are essential for sustenance of the



industries. Quality assurance laboratories, Ware housing including cold storages, common effluent treatment plants etc.

### **Conclusion:**

The supply chain management has to be improved in all the stages of the supply by adopting global best practices in storage, packaging, handling, transportation, value added service etc. And also by disintermediation and participation of organized players i.e., modern supply chain with a view to benefit both farmers as well as ultimate consumers.

### **Best Answer: Aniket Sachan**

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### **Suraj Sharma**

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## **27. There is a need to introduce second generation land reforms in India. Do you agree? Substantiate your views.**

### **Introduction:**

Second generation land reforms are aimed at reorganizing state and collective farms into family-size units and introducing market-oriented land systems. It is broadly about leaving resource allocation and production decisions to market forces rather than to the government institutions.

### **Body:**

Need for reforms:

- Universality- Previous reforms like tenancy act, land ceiling etc. benefitted many farmers but the benefits were unevenly distributed across classes and regions. New reforms are required to cover all potential beneficiaries.

- Land market development- Issues in land acquisition, transfer and lease of land prevents the development of a sound market mechanism where land is seen just as a resource that can help its owners in distress situation.
- Improved output- Land leasing, co-operative farming, contract farming etc. help farmers get better returns from the same piece of land, but it can only be exercised with increased market forces at play.
- Gender equality- There has been increased feminization of agriculture due to male migration, but women are still denied ownership rights over land.

How it can be accomplished:

- Land records modernization/computerization- Digital India Land Records Modernisation Programme (DILRMP) has been launched.
- Appropriate land compensation- The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 is meant to provide owners with rightful compensation.
- Land leasing- Model Agricultural Land Leasing Act, 2016 can help in this regard.
- Contract farming- Draft Model Contract Farming Act, 2018 has been released to strengthen rules and regulations regarding this.
- Consolidation of land holdings so that huge machineries can be utilized
- FDI in agricultural sector
- Co-operative farming
- Use of land banks and land pooling

### **Conclusion:**

For achievement of faster, sustainable and inclusive growth there is need for second generation land reform. The reforms can also help in achieving the goal of doubling farmers' income by 2022.

**Best answer: Sreelakshmy Viajayan Uma**

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## 28. What are the applications of nanotechnology in defence and space sectors? Discuss.

### Introduction:

Nanotechnology is manipulation of matter on an atomic, molecular, and supramolecular scale. This technology is emerging as an 'industrial force' worldwide. It has the potential to reduce costs with its multiple applications and the inherent ability to produce new materials like non-corroding and flexible iron.

Nanotechnology: Definition and concept

NT has two different but important meanings. One is a broad, stretched version that includes any technology dealing with something less than 100 nanometres in size.

The other is the original meaning and refers to designing and building machines in which every atom and chemical bond is specified precisely.

- NT is technology that operates anywhere within the nanometre length of scale. One nanometre is one billionth ( $10^{-9}$ ) of a metre. This is the realm of the atom, the smallest unit of an element.
- NT mainly consists of the 'processing, separation, consolidation, and deformation of materials by one atom or one molecule'.
- The most important aspect of nanotechnology-enabled products is the miniaturization of devices and the diverse functionalities that can be integrated within a singular system.

Nanotech in defence sector

- Nanotechnology is an area of science and technology that holds highly promising prospects for military applications, considering its wide applicability in defensive as well as offensive operations.

Electronics/Computers/Sensors

- Electronics is one area in which NT is making great strides. The use of NT applications will drastically reduce the cost and increase the performance of memory, displays, processors, solar powered components, and embedded intelligence systems.
- Miniaturization is expected to help microprocessors run much faster, thereby enabling computations at far greater speeds.
- In sensor manufacturing, NT has larger utility because it allows the production of smaller sensors down to the size of micrometres.
- Typical applications for such sensors are smoke detectors, ice detectors on aircraft wings, automobile engine performance sensors, etc.

- From a military point of view, the utility of NT in the field of electronics, computers, and sensors would essentially revolve around reducing the size of existing gadgetry and making them more efficient.

#### Bio-Defence

- NT is fast emerging as a new frontier in bio-defence. Currently, NT is primarily being used in the development of bio-sensors.
- Some countries are working on extremely small machines and tools that can enter the human body.
- By using a person's saliva, body fluids, or blood, Nano-biosensors can be created to reliably work with pathogens such as viruses.
- Drug and virus development costs can be reduced by using Nano-chips to test various medications or a combination of chemicals and vaccines.
- Treatment and faster recovery of injuries is possible through nanotech.
- Presently, NT is showing immense promise in the development of various direct and indirect applications useful for bio-defence purposes.

#### Chemical defence

- In the arena of chemical weapons terrorism, NT offers solutions against the usage of chemical agents like VX, HD, GD, and GB. Some nanoparticle oxides like CaO, Al<sub>2</sub>O<sub>3</sub>, and MgO interact with such chemicals much faster than micro particles and are ideally suited for fast decomposition of such chemicals.
- A sensing device for detection of nerve-gas agents in the atmosphere has been developed based on NT applications.

#### Conventional Weapons/Ammunition

- NT-based stronger and lighter materials would allow the building of conventional barrel-type weapons with reduced mass.
- It is conceivable that small arms and light weapons could use barrels, locks etc. made of Nano-fibre composites.
- Even in respect of ballistic and air-breathing missiles, the reduced mass could translate into a marked increase in speed, range, or payload as well as a reduction in carrier size.

#### Maritime applications

- Micro and nanoscale electronic packages are likely to maintain reliability under extremely harsh conditions resulting from concurrently acting vibrations, high-current density, high-power and high-temperature loads.

- Products such as functionally graded nanocomposites are exciting examples of the potential for NT to bring innovations from the bench to the fleet, while also providing an opportunity for reducing costs.
- Experts are of the view that nanoparticles can be used to mark ships, fishing boats, navigable channels, and delimiting safe heavens.
- The crystals are soluble in paints, fuel, lubricants, speciality chemicals, glues, etc. but cannot be easily counterfeited, removed, or altered by anyone except the authorised agency which designed them.

#### Aerospace and other defence applications

- Less vulnerable corrosive material is helpful in satellite manufacturing as well.
- Also, such structural materials and the miniaturization as such achieved by NT is likely to play a vital role in designing the next generation of unmanned aerial vehicles/unmanned combat aerial vehicles.

#### Space applications of Nanotech

##### Ignitors' life:

- The life of satellites, to a large extent, is determined by the amount of fuel they can carry on board.
- On-board ignitors wear out quickly and cease to perform effectively.
- Nanomaterials, such as Nano-crystalline tungsten-titanium diboride-copper composite, are potential candidates for enhancing ignitors' life and performance characteristics.

##### Light weight solar panels/cells:

- Apart from on-board fuel, satellites in outer space use solar power as a power source for various activities.
- Satellite designers are continuously working on finding the means to reduce the weight of such solar cells.
- Space scientists are trying to adopt nanomaterials as alternative materials to their conventional counterparts.

##### Applications of aerogels in space craft:

- Lighter Nano-porous materials like aerogels are found to have wider applicability in spacecraft manufacturing.
- Even some special lightweight suits, jackets etc. could be made using aerogels.
- Aerogels are a low-density solid-state material derived from gel in which the liquid component of the gel has been replaced with gas. The result is an extremely low-

density solid with several remarkable properties, most notably its effectiveness as an insulator.

- They are porous and extremely lightweight, yet they can withstand 100 times their weight.
- Space weather forecasting: Knowledge of space weather in the near Earth and solar space environment is critical for space research.
- Nanostructured sensors are expected to play a fundamental role in obtaining information on the ionosphere and other regions of space.

#### Nanotech in India's Space and defence sector

- The Government of India initiated a Nanomaterials Science and Technology Mission (NSTM). However, Indian investments in NT are not very encouraging.
- In the defence arena, India's Defence Research and Development Organization (DRDO) is working on areas like sensors, high-energy applications, stealth and camouflage, Nuclear, Biological, and Chemical (NBC) attack protection devices, structural applications, Nano-electronics, and characterization.
- Currently, its major focus is on developing various types of sensors, NBC protection/detection devices and developing paint with camouflage characteristics.
- ISRO also launched Nanosatellites, marking a milestone in space research and developments.

#### Concerns and way forward:

- NT applications may harm human health or the environment.
- Such legitimate concerns demand the formulation of tools to handle issues arising out of both civilian and military applications of NT.
- NT could suddenly change the regional/global 'military balance'. This would increase threat and reduce stability.
- To prevent or at least reduce such risks and instability, limitations can be agreed upon in advance before new weapons or technology are deployed, acting mainly at the stages of development and/or testing, and sometimes at the research stage.
- In the years to come, some non-state actors could also develop or otherwise acquire military-related NTs.
- Since the exact status of technology at this juncture is not known, some of these technologies when developed to their full capability may or may not come under existing export control regulations.
- It is argued that nanomedicine is one field where violation of laws designed under BTWC and the Chemical Weapons Convention (CWC) is likely to take place.
- Cost reduction will encourage more and more nanotech designed satellites launches and may lead to further increase in space traffic and debris.

#### **Conclusion:**

Military and space applications of NT are here to stay. States are likely to invest more and more into this technology for exploiting the dual-use nature of this technology. NT offers vital and varied applications as discussed above.

For India, Nano-sensors would have a great potential for real-time border surveillance through wireless networking.

Certain areas of NT, particularly molecular NT, are still in a nascent form of development and it is difficult to clearly identify their specific uses in defence and space.

Considering the leader in space research in South Asia, there is huge potential for India in applications of nanotechnology.

(Note: This synopsis has been made detailed to cover all possible applications, you can write some of them.)

**Best Answer: SID**

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## **29. Has India's IPR regime stifled innovation? Critically examine.**

### **Introduction:**

IPR refers to Intellectual Property Rights which are exclusive commercial rights for novel innovations. Intellectual property (IP) is a category of property that includes intangible creations of the human intellect such as copyrights, patents, and trademarks.

IP is key to innovation, and innovation is crucial in economic development. Thus the role of the Indian IPR regime is vital. India has adopted an IPR regime in line with international standards.

### **Body:**

However, India's IPR regime is alleged to stifle innovation because:

- It discourages ever-greening of patents with minor changes without any significant improvement in effectiveness or efficiency.

- The bureaucratic setup which is allegedly corrupt, unresponsive and lacks expertise to recognize and promote innovation.
- Allegedly, no major successful initiatives have been taken by the agencies concerned either to popularize IPRs in India.
- Lack of swift and cost-effective judicial measures to enforce IPR exclusivity and the resultant plagiarism.
- Weak link between local Indian companies, individuals and Indian IP authorities: India filed only 1.18% of global patent filings, number of foreigner filing in India is higher
- Few patent examiners result in patents processed per examiner declining
- Speed of granting patents more slower compared to global standards
- Copycats: Allowing generic products (like drugs) etc. promote Indian living standards, generate employment at the same time affecting the innovator.

However, the counter arguments are:

- Ever-greening has been found to stifle innovation, becoming a tool to further concentrate in the hands of fewer companies.
- Despite the meagre state support to R&D in the country, India ranks 6th worldwide in terms of IPR creation. For e.g. Ericson company found India patent friendly nation

Steps taken to promote innovation:

- 1) Transparency: Filing and examination results are now public domain
- 2) Low cost of filing patents compared globally
- 3) Start-up benefits: Start-up Intellectual Property Protection helps start-up gain tax benefits, reduce filing costs and protect trademarks, copy rights etc.
- 4) Establishment of New numbering system compatible with global IP offices.
- 5) Prevention of ever greening patents (US medicines most expensive compared to Indian ones)

### **Conclusion:**

As such, to suggest that India's IPR regime has stifled innovation would be an exaggeration. Initiatives such as CIPAM, TRIPS compliance can promote the delicate balance between ensuring societal benefit without stifling innovation adequately. But it's true that by creating popular awareness about IPRs and by providing effective & cost-efficient judicial-legal remedies against IPR violation, we can further accelerate innovation in India.

**Best answer: Shri**



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### **30. What are your views on gene editing? Should it be allowed? Evaluate its pros and cons.**

#### **Introduction:**

Gene editing, which is also known as genome editing, involves the insertion, deletion, or replacement of DNA (deoxyribonucleic acid) in a gene.

Several different methods that can be used to edit genes (Note this is extra info -not needed in answer)

1) Zinc finger nuclease technology: Has been used longer than any other gene-editing method. First developed in the 1990s, this approach involves the binding of a pair of ZFNs to a DNA target.

2) TALEN (transcription activator-like effectors nuclease) Developed in 2009 .TALENs are produced by a common type of plant bacteria. Like ZFNs, TALENs bind to and cut targeted DNA sequences. A key advantage the TALEN gene-editing method holds over ZFN is that engineering TALENs is simpler than using ZFNs.

3) CRISPR (the biggest development in gene editing was the discovery of clustered regularly interspaced short palindromic repeats (CRISPRs). The CRISPR method uses bacterial enzymes to target and cut specific sections of DNA. CRISPR is simpler and cheaper than earlier gene-editing methods.

#### **Body:**

Pros about Gene editing:

- Cancer Therapeutics: New immune therapies can be developed using CRISPR to treat cancer. Scientists can genetically modify T-cells using CRISPR to locate and kill cancer cells.
- Curing Genetic Diseases: CRISPR technology can eliminate the genes that cause genetic diseases such as diabetes, cystic fibrosis. Given that the scientific community has already mapped many genes that cause the genetic disease, CRISPR could be used to cure faulty genes that cause genetic diseases.

- Drug Research: Scientists are predicting that CRISPR could potentially speed up the drug discovery process given the technology is relatively cheap, precise and simple to use. Some of the drug makers in the world are already incorporating CRISPR technology in their drug research and discovery phase.
- Pest Resilient Crops: According to Jennifer Doudna, CRISPR pioneer, genome editing could address pest and nutrition challenges facing agriculture, especially in light of climate change and rapid population growth.

Cons about gene editing:

- Changes to the Germ-line Cells: This could potentially lead to development of designer babies which would create divisions in society as designer baby will have more genetic advantage over the other
- Bio Weapons: The former U.S. director of national intelligence listed “genome editing” among six threats in the section on weapons of mass destruction in 2016. The technology can be used to genetically modify bacteria or viruses to wage biological attacks against humans.
- Unknown diseases to human : There is a rising fear that genome editing can cause different type of diseases still unknown to human

Should Gene editing be allowed:

- Gene editing should be encouraged to enhance the advancements in field of science and improve the standard of living of people E.g.: CRISPR technology is targeting to treat the rare disease caused by mutation of one gene. At the same time a common guidelines need to be developed by international community’s which set the guidelines of what risks are acceptable and what are not.

### **Conclusion:**

Like every new technology gene editing has two sides the need is to encourage the positive side while being cautious about negatives.

### **Best Answer: Mudrarakshas**

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**31. Examine the factors that have constrained research and innovation capabilities in India. What measures be taken to promote indigenisation? Suggest.**

**Introduction:**

Research and innovation determines the growth trajectory of a nation and are essential for overall development be it social, economic or human development parameter.

**Body:**

Factors that have constrained research and innovation capabilities:

- Low level of research investment– As per UNESCO Institute of Statistics data, India spends 0.8% in GDP on R&D, which is notably less than China’s 2% or the 2.7% of the US Or 4.2% of Israel.
- Lagging private sector– Insufficient scientific research in India’s private sector seems to be part of the problem. The large pharmaceutical sector, for example, remains dominated by the fabrication of generic products rather than original formulations.
- Weak industry-academia linkage– Unlike western countries in India there is a disconnection between industry needs and academics creating a vacuum in research and innovation.
- Neglect at university level– A large section of the country’s public research is concentrated in national research centres such as the S. N. Bose Center, the Raman Research Institute and organizations such as the Indian Association for the Cultivation of Science. In comparison, research at universities has been neglected.
- Lack of infrastructure– Physical as well as other enabling infrastructure is missing to help in research capabilities.
- Insufficient FDI– FDI in India has focused on setting up back-end offices for R & D centers in developed countries.
- Issues regarding Intellectual Property rights (IPR)– Weak enforcement of IPR rules prevent the development of innovation ecosystem in the nation.
- Unethical practices– the urge to make illegal money, immense misuse of power, frivolous publications and patents, faulty promotion policies, victimization for speaking against wrong or corrupt practices in the management, sycophancy, and brain drain.

Measures taken by government:

- Various schemes have been introduced to improve the quality of research institutes, for the promotion of technology business incubators (Atal Incubation Centres) and research parks that promote innovative ideas until they become commercial ventures.
- Government procedures and approvals for scientists and researchers have been placed online and made transparent, thereby assuring “Ease of Doing Science”.

- PM fellowship scheme aimed at encouraging young, talented, enthusiastic and result-oriented scholars to take up industry-relevant research.
- Atal Tinkering Labs ensure that dedicated workspaces are created for students to innovate and develop ideas that will go on to transform India.
- Platforms like “Innovate India” promote and recognise innovations happening across the nation by enabling citizens to share their innovation.
- Unnat Bharat Abhiyan 2.0 to help bring transformational change in rural development processes by leveraging knowledge institutions to help build the architecture of an Inclusive India.
- IMPRINT India is aimed at adopting engineering and technology as the vehicle to addressing the societal needs and achieving national prosperity
- Forging technology and innovation partnerships with other nations like India-Israel Innovation Bridge will act as link between start-ups of India and Israel.
- Various enabling policies like Science, Technology & Innovation Policy 2013, National Intellectual Property Rights Policy, Technology Vision Document 2035 and Space Vision India 2025 have been framed.

Way forward:

- Increased R&D investment up to 2% of GDP
- Improve industry-academia linkages
- Favourable policies to boost innovation ecosystem
- Boost to private sector
- Attract foreign investment in research
- Encourage grass root level innovators
- Strengthen IPR policy regime
- Upgrade infrastructure

### **Conclusion:**

India has realized the importance of promoting research and innovation, which can be seen from the fact that it made a quantum leap of 21 places in the Global Innovation Index in two years and stands as the 57th most innovative nation in the world today.

**Best answer: Gargi Gupta**

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**Jean Grey**

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### **32. What are the current strategies to deal with the problem of naxalism? How effective have they been? Examine.**

#### **Introduction:**

Naxalism can be traced back to its origin in Naxalbari village of West Bengal state. It started as a movement to voice its concerns by landless labourers and tribal people and gradually has become an internal security threat to the country.

#### **Body:**

Strategies to deal with Naxalism:

- Left Wing Extremism (LWE) Division- It was created in the Home Ministry to effectively address the Left Wing Extremist insurgency in a holistic manner. It implements security related schemes aimed at capacity building in the LWE affected States.
- Security Related Expenditure (SRE) scheme- Formulated for the purpose of reimbursement of security-related expenditure like transportation, communication, the hiring of vehicles, stipend to surrendered Maoists, construction of infrastructure for forces etc.
- Media Plan- Maoists have been misguiding and luring the innocent tribal/ local population in LWE affected areas by their So-called poor-friendly revolution through petty incentives or by following their coercive strategy. To deal with their false propaganda, activities like Tribal Youth Exchange programmes organised by NYKS, radio jingles, documentaries, pamphlets etc. are being conducted
- Aspirational District- The Ministry of Home Affairs has been monitoring Aspirational districts programme in 35 LWE affected districts
- Modernisation and upgradation of the State Police and their Intelligence apparatus and fortification of Police stations
- Ensuring rights and entitlements of local communities
- Improvement in governance and public perception management
- Better equipment of CRPF
- Setting up of Counter Insurgency and Anti Terrorism (CIAT) schools

- Assistance in training of State Police through the Ministry of Defence, the Central Police Organisations and the Bureau of Police Research and Development
- Facilitating inter-State coordination
- Assistance in community policing and civic action programmes

Effectiveness of the above mentioned strategies:

- Reduced geographical extent- Most of the left-wing extremism has been restricted to just 30 worst-hit districts.
- Increased attacks- There has been an increase in attacks but decrease in area of influence.
- Militarization- There has been greater militarization of the banned Communist Party of India (Maoist) in areas within the Red Corridor.
- Lost leadership- Paramilitary and police actions have resulted in the death of senior leaders
- Tribal-Maoists disconnect- Welfare measures, even if they have been implemented haphazardly, have enabled outreach into tribal areas where the state was hitherto absent. These actions have forced the Maoists to retreat further into the forest areas of central and south-central India
- Changing characteristics of naxalism- Alignment with organized crime, international links, impoverished weapons, support from urban intelligentsia etc.

### **Conclusion:**

The government's strategy of using military force along with allocation of funds for infrastructure and welfare programmes is bearing fruits. Need is of further consolidation of actions and speedy implementation of welfare schemes.

### **Best answer: Shri**

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**33. Do you think development deficit is the root cause of left wing extremism? Critically comment.**

### **Introduction:**

The Left Wing Extremism (LWE) is the most serious internal threat the country is facing. Naxalism has been operating in several parts of the country. It has been there from the late 60s and 70s and different parts of the country have been affected with different levels of naxal violence. It has been tackled in different ways in all the seven affected states.

A significant change came about with the merger of the Peoples War Group and the MCC to form the CPI (Maoist) in 2004. Thus, there had been a fusion of the ideology with the armed groups, both coming together for the first time.

### **Body:**

Development deficit in left-wing affected areas:

- Land reforms: Beginning of LWE is often attributed to failure of land reforms in newly independent India. Most of the people living in Maoist affected areas are primarily agriculturists. For them land is the most important asset from which they are deprived of ownership.
- Resource Curse and Industrialisation: Almost complete north to south contiguous belt of LWE affected area is rich in resources. Minerals such as iron ore and coal attracted many heavy industries, affecting the agriculture of the local people and exploitation of labour.
- Administrative and political neglect: Apathetic behaviour of administrators and lack of political will and integration is another major developmental issue in LWE affected areas.
- Health, education and other public services: Lack of basic services such as quality healthcare, education, sanitation and other municipal services are leading to further deterioration of already poor communities.
- Infrastructure: LWE affected areas are mostly remote and interior forest areas which lack proper road, railways and other communication infrastructure. Electricity and other basic infrastructure is also in poor condition.

But, development is not the only cause of Left Wing Extremism:

- Maoists don't believe in parliamentary democracy. They want to establish communist ideology in governance of the country.
- The objective of the Maoist agenda is the armed overthrow of the Indian State.
- Socio-cultural isolation is also another cause of feeling of alienation among people of LWE areas. Many of them have their own local tribal culture and ethnic identities.
- Denial of forest rights remains one of the grievances of affected people.
- Foreign funding by hostile countries to destabilize country and propaganda of Maoism is also responsible of persistent and violent behaviour of Maoists in India.

### **Conclusion:**

From all the above observations and points it can be concluded that development is not the only reason behind violent Left Wing Extremism, but there are some other issues. The most basic is ideology itself is major bone of contention.

**Best answer: Krishnakant**

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**34. How do external state actors use terrorism as a tool to destabilise the internal security of a state? Analyse with reference to India.**

**Introduction:**

External state actors include the governments and their agencies such as military, intelligence apparatus, Government run industries etc. They have formal backing of a sovereign state for carrying out any intended action.

**Body:**

State actors may act against other states if there is clash of interests in terms of ideology, economic or strategic interests. Towards this end, terrorism is employed as a tool by external state actors.

Countries such as China, Pakistan through political backing, economic assistance, logistic support, military training or arms supplies have supported terror outfits and insurgent groups. Terrorist groups like Lashkar-e-Taiba (LeT) and Indian Mujahideen (IM), though non-state actors, have de facto support from Pakistan who are behind Mumbai attack and attack on Indian parliament. By supporting terror groups, these countries have used terrorism as a tool to disrupt peace and destabilize internal security of India.

How terrorism destabilizes internal security:

- Acts of terror like bomb blasts in major cities (Mumbai attack), attack on important places/institutions results into death of civilians. Violent acts instil fear in the minds of the people.
- Justifying their actions as retaliation against atrocities on minorities and targeting people of particular community/religion disrupts social harmony. Appeal to religious



sentiments is likely to increase religious hatred leading to communal conflicts and riots.

- Radicalisation of youth and possibility of lone-wolf attacks.
- By supporting insurgent groups promote regionalism/secessionist tendencies in the country. Example: insurgent groups in North-East, Kashmir separatism.
- Problem of drugs in Punjab and certain states of North-East like Manipur and there are enough evidence for link between drug trafficking and terrorism.

Thus in a nutshell pose country with internal security challenges like communalism, regionalism, extremism and organised crime.

### **Conclusion:**

India has been at the receiving end of terrorism over the years. Over the years Government of India has taken measures like setting up National Security Agency (NSA), NATGRID, strengthening army and coastal guards. However, new means of terror warrants sustained vigilance.

### **Best answer: Another Being**

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## **35. How does China-Pakistan axis pose a threat to India's security ecosystem? Analyse.**

### **Introduction:**

China and Pakistan describe each other as "all-weather friends". According to Pakistan, Pak – China friendship is sweeter than honey and higher than the mountains.

### **Body:**

As such, this China-Pakistan axis poses a threat to India's security ecosystem in the following ways:

- It opens a two-front war possibility for India, something which we might not be able to counter, given our weakness, especially vis-à-vis China.
- China is able to constrain India's economic growth and military might by forcing India into greater defence expenditure.
- China wants to interfere in Kashmir issue, while India wants bilateral solution.

- Pakistan is able to sustain cross-border terrorism despite a domestic Balance of Payments crisis, using Chinese funds and material (including Chinese-made grenades).
- They're able to combine their efforts in destabilizing Indian economy by exploiting open & porous borders with India, Myanmar and Bangladesh for Infiltration of terrorists disguised as legal migrants, Supply of fake currency and Trafficking of humans as well as goods.
- Money laundering, Supply of illegal arms and ammunitions
- Further, China is helping Pakistan gain military nuclear technology like Ghazini including strategic war heads, nuclear triad etc. which further destabilize Indian neighbourhood.
- The two countries are also collaborating in destabilizing other Indian neighbours including Bangladesh, Pakistan and Nepal thereby further creating threat to India's security ecosystem.
- Passing of CPEC through POK affects the sovereignty and territorial integrity of India.
- Impediment in India's bid to NSG, also China vetoes resolution against Pakistan in UNSC.

### **Conclusion:**

We need to strengthen our economic and security apparatus so as to able to strengthen both our domestic as well as foreign policy ventures to counter this threat.

### **Best answer: Ankur**

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### **36. What is the threat perception associated wit China's aggressive infrastructure expansion in the border areas? Discuss.**

#### **Introduction:**

China's "One Belt, One Road" (OBOR) policy is aimed at investing large sums of money in infrastructure development in the area between the two Silk Roads, in an effort to join them together and create one ordered area. This extends beyond mere economic activity, however, and includes establishing a whole host of rules, from cultural exchange to the movement of people.

## **Body:**

Threat perception with regard to Chinese excessive expansion in border areas:

- 1) Threat to India's Sovereignty: China-Pakistan Economic Corridor, or CPEC, which passes through Pakistan-occupied Kashmir. The corridor threatens territorial integrity of nation.
- 2) Expansion of Military: The infrastructure being built by China, including roads, railways and ports, will benefit China's military, enabling Beijing to secure an effective means for communication and the movement of troops in a contingency. This would enable rapid mobilisation of military at the times of conflict
- 3) Control of Maritime trade: CPEC gives China a foothold in the western Indian Ocean with the Gwadar port, located near the strategic Strait of Hormuz, where Chinese warships and a submarine have surfaced. Access here allows China greater potential to control maritime trade in that part of the world – a vulnerable point for India, which sources more than 60 percent of its oil supplies from the Middle East.
- 4) Curtail India's influence in neighbourhood: Nepal which was historically close to India is now seeking help from China to use its ports for transport of goods, proposed rail corridor between Kathmandu and Tibet is example of growing influence of China in Nepal.
- 5) Threats of insurgency in North East: The illegal use of money and providing external help in forms of arms can cause unrest in North East.

India realises the potential risks and hence has its own set of connectivity initiatives such as Myanmar's Kaladan project, the Chabahar port project with Iran, as well as the north-south corridor with Russia which could be potentially leveraged. The proposed 7200-kilometer International North South Transportation Corridor is a ship, rail and road transportation system connecting the Indian Ocean and Persian Gulf to the Caspian Sea via Iran to Russia and North Europe.

## **Conclusion:**

India need to be cautious with growing influence of China and at same time strive and improve its infrastructure in North East and its relations with neighbouring countries.

## **Best Answer: Lame Name**

China is pursuing aggressive infrastructure expansion of both human and physical infrastructure in border areas. This is evident from:

- Karakoram highway
- Resettlement of Chinese citizens in Tibet with the intention to change the regional ethnic mix.
- Surveillance of Uighurs in Xinjiang

- Industrial development with policy reform to promote industrialization in its interior areas.

This infrastructure expansion entails the following threat perception from India's standpoint:

- **Illegal migrants:** Social harmony will be disrupted as illegal migrants, disgruntled with Chinese surveillance and intrusive governance might flee to bordering Indian territory (e.g.: Tibetans, Uighurs etc.) These migrants might also upset the local resource balance, given that even Indian border areas are relatively underdeveloped.
- **Military threat:** In case of conflict, this infrastructure would facilitate rapid mobilization of arms and personnel against India. Given our topographic realities along Chinese border, we might lag behind.
- The frequency of border intrusions by Chinese military might increase further.
- It curtails India's sphere of influence in the Himalayan and South Asian region (Nepal, Bhutan, Myanmar, Bangladesh etc.) where China would be able to play a more proactive role, as is evident from its mobilization during Nepal earthquake (2015). Example: China now proposes a tunnel railway project between Tibet and Kathmandu. BCIM corridor is another step in this direction.
- It would further strengthen the anti-India sentiments in Indian neighbourhood by using is (money and military) hard power, thereby creating new security threats for India, such as by:
  - Supporting insurgency
  - Illegal arms, ammunitions,
  - Money laundering and FCNR etc.

India needs to shore up its military and security weakness vis-à-vis China to counter this threat perception.

### **37. What is parallel economy? What are its implications for the internal security scenario? Discuss.**

#### **Introduction:**

Left Wing extremism, North-east insurgencies and Jammu & Kashmir crisis are three of the most critical internal security issues India is currently facing. Parallel economy is one of the biggest reasons that even after seventy years of independence country still struggling to contain these issues.

#### **Body:**

What is parallel economy?

The black economy or parallel economy consists of all the activities in which black incomes are generated and black incomes are factor incomes, property incomes, not reported to direct tax authorities.

A parallel economy in its broadest sense may consist of –

- Illegal economy, such as money laundering, smuggling;
- Unreported economy including tax evasion;
- Unregulated economy i.e. economic activities outside law and regulations.
- India's parallel economy is estimated to be 62% of GDP, generating about Rs 93 lakh crore of revenue.

This economy is running with the help of various factors such as counterfeit currency infused through borders, tax heaven, organised crimes and unorganised market, and hostile behaviour of foreign factors. Hawala and Benami transactions, tax heavens etc are also significant facilitators of parallel economy.

Implications of the parallel economy on internal security of India:

Parallel economy is the main source of resources for all the major internal security issues of India.

- Economic terrorism: The country has to contend with Economic terrorism. Pakistan has been flooding the country with counterfeit currency with a view to subverting its economy and funding terrorist activities in different parts of the country. It is estimated that Pakistan pumped in 16 billion worth of FICN into India in 2010, a figure that rose to 20 billion in 2011 and 25 billion in 2012.
- Organised crime: Organised crimes in India especially in metro cities such as Mumbai and Delhi are rising due to flourishing parallel economy. Such organised criminals also fund for radicalisation of youth and terrorist attacks.
- Religious or ideological extremism: Parallel economy is greatest source of financial help to extremists. Financial incentives lure unemployed youth towards antinational activities in the name of particular religion or ideology.
- Cybercrime: Crypto-currency and unrecorded cash transaction in e-commerce are also emerging means to supply resources to hostile elements in the country.
- Armed violence: Armed violence which was hitherto legacy of Maoists or insurgencies is now taking a new form throughout India especially in the form of right wing extremism. Recently there has been report of seizure of illegal weapons and public firing by individuals. Black money is easy source of illegal arms trade in India.

Measures taken by Government to contain parallel economy

- Voluntary income declaration schemes, such as Gareeb Kalyan Yojana
- Demonetisation
- Tax reforms; GST
- The Benami Transactions (Prohibition) Act
- Prevention of Money Laundering Act
- Financial Action Task force; for international cooperation in case of terror funding
- Reviewing of Double Taxation Avoidance Agreements
- Formalisation of economy
- Banking reforms
- Promotion of cash less economy: Digitisation of economy

### **Conclusion:**

Though we have taken many measures to contain the parallel economy but success is far below the potential. Political will to curb corruption and organised crime, and poverty alleviation along with social will to remove the cancer of black economy from society can only lead to elimination of parallel economy and subsequently control over internal security of the country.

### **Best Answer: P29**

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### **38. How does social media lead to youth radicalisation? Examine the modus operandi?**

#### **Introduction:**

In today's digitized world, People are well connected than ever before thanks to Mobile phones and internet penetration. With usage of social media platforms like Facebook, Twitter world has turned from being 'connected' to 'hyper-connected'.

#### **Body:**

While social media platforms have brought people, their ideas and experiences together, they have also been misused by anti-social elements to disturb peace in the world. Among many, radicalisation of youth through social media is one such misuse.

Radicalization is a process by which individual or group comes to take up a violent form of action. It is directly linked to an extremist ideology that contests the established order at the political, social or cultural level. People are susceptible to political (Right wing & Left wing), Religious, Psychological and Socio-Economic radicalization.

Radicalism has been used interchangeably with notions such as fundamentalism-religious approach, indoctrination-mental control, Jihad, extremism and terrorism, among others.

How social media leads to radicalisation:

- Social media platforms have become an active vector for violent radicalization.
- Extremist groups take advantages that stem from the very nature of Internet and social media channels like communication channels that are not bound to national jurisdictions and that are informal, large group, cheap, decentralized and anonymous
- This allows terrorists to network across borders and to bypass time and space. Specifically these channels provide networks of recruiters, working horizontally, in all the countries they target due to the trans-border nature of the Internet.
- With such wider reach, radical groups target vulnerable individuals- taking advantage of psychological factors like isolated people and those looking for belongingness and self-identity; appealing to their social grievances like inequality, discrimination and social exclusion; exploiting emotional attachment of people towards their religion.
- This would be done in several ways: Create appealing, interactive user-friendly platforms to attract younger audiences; Offer spaces where groups can maintain secret but highly democratic communication modes on the assumption that everyone can participate; Disseminate extremist, violent and criminal content, which would not be well received offline; Identify potential participants and provide them with information about 'the cause' and the groups involved in defending it; Deliver massive publicity for acts of violence and enhancing a perception of strength.
- Thus through propaganda and indoctrination, individuals are radicalized and they resort to violence to this achieve their end.

NOTE: You need to substantiate points with example.

### **Conclusion:**

Going forward, efforts should be channelized to

- Make use of these new technologies-social media as a tool for preventing radicalization especially by making it possible to propose a counter-narrative on the Internet; to encourage citizen education and critical thinking; in support of human rights, dialogue, mutual understanding and tolerance;
- Follow multidimensional approach to analyse and prevent the root causes of radicalization.

**Best answer: SID**

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### **39. What do you understand by benami transactions? How does it operate?**

#### **Introduction:**

Benami Transaction, in common parlance, refers to a transaction in which a property is transferred in the name of a person, whereas the consideration for the same is paid by some other person.

#### **Body:**

Operation of benami transactions

Naamdhar – He/she is the person on whose name the property is purchased. He can be wife/husband, relatives, poor cultivators depending upon the moneylender, offshore fictitious person etc. -which even may not exist, is unaware or coerced.

Benaamdhar – He/she is the person who actually owns the property. This may be in Indian context anybody corporate, money lender, politician, businessperson. The main motive is to invest illegal and unaccounted money into economy and get returns off.

Finally by various methods of coercion, or shelling of companies, false records, bribe etc. The property is purchased but remains under control of benamdaar.

Consequences:

- Black money
- Sky rocketing prices of property
- The common man suffers to afford a House
- Loss of revenue to government
- Money can be later used to illegal activities

#### **Conclusion:**

Real Estates Regulation act, Benami transition (prohibition) Act and linking Aadhar with PAN has led to reduction in this illicit corrupt business as can be seen from slump in the market.



**Best answer: Suraj Sharma**

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#### **40. Enumerate the security threats imposed by misuse of communication networks and social media.**

##### **Introduction:**

Smartphone and internet usage in India is set to massively swell in the next four years.

By 2022, there will be 829 million smartphone users in India, accounting for 60% of the population, according to Cisco's 13th annual Visual Networking Index (VNI).

With the increase penetration of smartphones, the security threats related to cyber space are cause of concern

Security threats due to misuse:

- **Social engineering:** Today, 'social engineering' is one of the most prevalent social media threats and also the most popular tactic for cyber criminals. Social media platforms allow attackers to find personal information that can be used to target specific individuals. Using information from employee profiles, a plausible fake account can be created to establish trust over time. Once the trust is built, the attacker might start asking for specific information, like internal server names, project names, or even have the new friend open an infected document or visit a prepared website that will drop a backdoor onto their computer. Eg: The recent case of BrahMoS Engineer being lured by Pakistan's ISI.
- **Targeted phishing attacks:** Such attacks are carried out to steal money or confidential information, as was the case with the Hydraq attacks in early 2010 that compromised critical information of several multi-national companies. This social media threat is an example of social engineering tactics, whereby attackers exploit fear and anxiety, instead of system vulnerability to get users to part with their money. Since these attacks are so specific and targeted, the chances of success are higher. Rent Examples from India include July 2006 attack on Union bank of India swindling bank of \$171 million, a prompt action did help to recover the amount, data theft of millions of users of zomato.

- Steal of confidential information of official. National, defence and businesses through advanced persistent threats Eg: DeepPanda in 2015 – attack on US office of personal management by China, StuxWorm 2010-Attack on Iranian infrastructure .
- Fake news: The internet has enabled a whole new way to publish, share and consume information and news with very little regulation or editorial standards. This has in turn led to deliberate propaganda and clickbait articles causing disharmony in society Ex: Communalism of incidents related to death of person
- Radicalisation of youth: The modus operandi of ISIS was usage of social media to spread the message and target vulnerable youth who felt alienated leading to increase in crimes like lone wolf attack in West.
- Criminal Activity and Money laundering: Organised criminals are now using social media to recruit some public individuals to act as unsuspecting money launderers of their money they got from their dirty works like drug smuggling, people trafficking and fraud.

The various steps which can be taken to safeguard the threats include

#### 1) PPP Model for Cyber security:

State Cybersecurity Framework shall be envisaged in P-P-P Model

Government shall partner with the private sector and the academia to strength cybersecurity posture of the state.

#### 2) Information Security policy and practises:

IS Policies & practises shall be mandated at govt. functionaries & its service providers

Security Audit Adhering to international standards applicable for all govt. websites, applications before hosting and publishing

Govt. to ensure ISPs operating in the state shall deploy cybersecurity plans in line with State cybersecurity policy.

#### 3) State Computer Response teams:

Establishment of the State CERT to operate in conjunction ICERT and coordinate with NCIIPC

Cybersecurity drills shall be carried out under the supervision of I-CERT

#### 4) Security Budgets:

Govt. agencies implementing IT Projects shall allocate appropriate budget towards compliance with the security requirement of IT Act 2000 and State cybersecurity policy, ISMS, security solution procurement and trainings.

#### 5) Capacity Building and awareness:

Govt. shall take appropriate steps for enhancing awareness of citizens and small business for cybersecurity

Cybersecurity Capacity building and training for professional, extending ISEA program, introducing curricula academia and organizing conferences

Strengthen LEAs through training and establishment of forensics labs.

**Conclusion:**

With the increase in penetration of internet in India, need is to be aware of risks and handle those risks on war footing.

**Best Answer: Swapnil**

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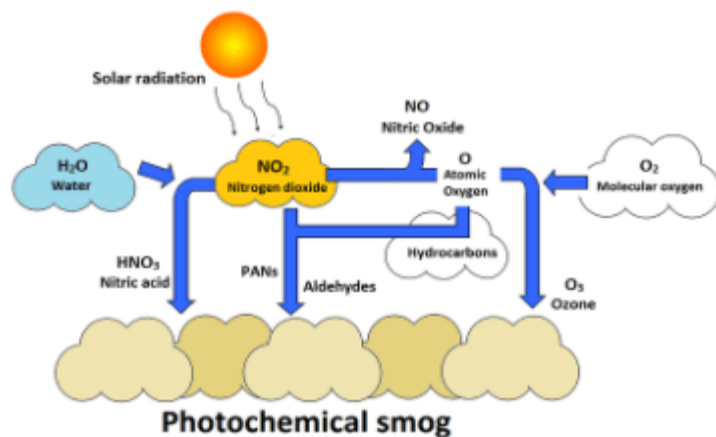
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**41. What is photochemical smog? How does it affect northern regions in the country? What measures have been taken to address this problem?**

**Introduction:**

Photochemical smog is a type of smog produced when ultraviolet light from the sun reacts with nitrogen oxides in the atmosphere. It is visible as a brown haze, and is most prominent during the morning and afternoon, especially in densely populated, warm cities.

**Body:**



### Causes of Photo Chemical Smog

- 1) Stubble burning in areas of Punjab and Haryana It is estimated that approximately 35 million tonnes of crop are set afire by these states. The wind carries all the pollutants and dust particles, which have got locked in the air.
- 2) Rise in vehicular population: The Central Pollution Control Board (CPCB) and the National Environmental Engineering Research Institute (NEERI) have declared vehicular emission as a major contributor to Delhi's increasing air pollution which in turn increases photochemical smog
- 3) As the winter season sets in, dust particles and pollutants in the air become unable to move. Due to stagnant winds, these pollutants get locked in the air and affect weather conditions, resulting in smog.
- 4) Industrial pollution and garbage dumps are also increasing air pollution and building-up smog in the air.
- 5) Large scale construction in Delhi-NCR is another culprit that is increasing dust and pollution in the air.

### Effects of Photo-Chemical Smog:

#### 1 Health Effects:

Photochemical smog is capable of inflicting irreversible damage on the lungs and heart. Even short-term exposure to photochemical smog tends to have ill effects on both the young and the elderly. It causes painful irritation of the respiratory system, reduced lung function and difficulty breathing. High levels of smog also trigger asthma attacks because the smog causes increased sensitivity to allergens, which are triggers for asthma.

#### 2 Environmental Effects:

The collection of chemicals found in photochemical smog causes problems for plants and animal life. Some plants such as tobacco, tomato and spinach are highly responsive to ozone, so photochemical smog can decimate these sensitive crops, trees and other vegetation. Ozone causes necrotic (dead) patterns on the upper surfaces of the leaves of trees. Ground-level ozone also can interfere with the growth and productivity of trees. The effects of smog on animals are also similar to its effect on humans; it decreases lung capacity and lung elasticity.

3 Transportation: reduced visibility lead to accidents in many northern cities during winter.

4 Acid rain: Corrode architectural monuments like Taj Mahal

Measures taken to solve the problem:

- National Clean Air Programme (NCAP) was launched by MoEFCC in April, 2018 and this was preceded by Clean Air Programme in Delhi in February 2018 to sensitise the public in general and implementing agencies in particular.
- Significant action has been taken in Delhi and NCR, including the formulation of Graded Response Action Plan (GRAP) by CPCB.
- Other Measures include ban on petcoke in Delhi and NCR; strict surveillance over coal-fired plants; strict action against construction activities; regular field surveillance by CPCB teams starting from September 2017; augmentation of air quality monitoring stations in Delhi and NCR; upgradation of Central Control Room in CPCB; integration of data on air quality from stations of Indian Meteorological Department (IMD); Delhi Pollution Control Committee (DPCC) and Central Pollution Control Board (CPCB); launching a Mobile App called SAMEER for grievance redressal;
- Leap-frogging from BS-IV to BS-VI.

The need of hour is to reduce effects of photochemical smog. Suggestion of NITI Aayog on initiative "Breathe Free India" needs implementation.

**Best Answer: Dazy Rani**

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## 42. How severe is the problem of groundwater contamination in India? What are its most causative factors?

### Introduction:

Ground water contamination is the presence of certain pollutants in ground water that are in excess of the limits prescribed for drinking water.

### Body:

Severity of groundwater contamination:

- According to the Composite Water Management Index developed by Niti Aayog, 70% of the water resources are identified as polluted.
- A study, published in Environmental Science and Technology Letters, has found over 30 micrograms per litre (mcg/l) of uranium in parts of north-western, southern and south-eastern India, which can damage one's kidneys.
- Arsenic contamination- West Bengal, Jharkhand, Bihar, Uttar Pradesh, Assam, Manipur and Chhattisgarh – have reported contamination level that is above the permissible limit of 10 micrograms per litre ( $\mu\text{g/L}$ .)
- Nitrate levels above 10 mg/L (10 ppm) in groundwater caused “blue baby syndrome” in several villages in Punjab.
- Many states have a high concentration of Fluoride, way above the permissible limit, in groundwater.
- Most of the Indian states report high salinity in groundwater.

Causes for groundwater contamination:

- Industries- Manufacturing and other chemical industries require water for processing and cleaning purposes. This used water is recycled back to water sources without proper treatment. Also industrial waste is dumped in certain areas, the seepage of which results in groundwater contamination.
- Agriculture- the fertilizers, pesticide and other chemicals also contaminate groundwater.
- Residential areas- These generate pollutants (microorganisms and organic compounds) for groundwater contamination
- Mining- Mine drain discharge, oilfield spillage, sludge and process water also contaminate groundwater.
- Coastal areas- Saltwater intrusion increases the salinity of groundwater in nearby areas.
- Excessive extraction- It increases the concentration of minerals in the extracted areas, thus making it contaminated.

### Conclusion:

Recent decision of Central Ground Water Authority (CGWA) for industries to pay a water conservation fee (WCF) is a welcome step. It is very difficult and costly to treat contaminated groundwater. Hence, it is better to minimize the risk of groundwater pollution. Public awareness programs about the importance of groundwater and ways to minimize its contamination should be implemented.

**Best answer: Dazy Rani**

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### **43. What is social impact assessment (SIA)? Why is it important? Discuss.**

#### **Introduction:**

Very frequently we find in newspaper headlines that somewhere people are protesting against any Industrial project or nuclear power plant or metro line construction, etc. They protest because they fear that this particular project will hamper their lives. To amicably solve such conflicts and for sustainable and inclusive development “Social Impact Assessment” is an effective tool.

#### **Body:**

What is social impact assessment (SIA)?

A Social Impact Assessment is a process of research, planning and the management of social change or consequences (positive and negative, intended and unintended) arising from policies, plans, developments and projects (UNEP, 2007).

The social impacts of a project are the direct and indirect impacts that affect people and their communities during all stages of the project lifecycle.

In preparing the SIA, the project owner is required to undertake community and stakeholder engagement to;

- Understand who is likely to be impacted and how
- Understand the affected communities
- Identify and assess potential social impacts
- Develop management measures to mitigate adverse impacts and enhance benefits
- Support monitoring and reporting

## Significance of SIA:

The core focus of an SIA is on the important impacts of projects and developments beyond the impacts on natural resources. Examples of social impacts include:

- People's ways of life – that is, how they live, work, play and interact with one another on day-to-day basis.
- Their cultures – that is their shared beliefs, customs, values and language or dialect.
- Their community – its cohesion, stability, character, services and facilities.
- Their political systems – the extent to which people are able to participate in decisions that affect their lives, the level of democratization that is taking place, and the resources provided for this purpose.
- Their health and well-being – health is a state of complete physical, mental, social and spiritual well-being and not merely the absence of disease or infirmity.

From the listed examples above, it is clear that the SIA must look not only at social issues but also at the environmental impacts and their interactions.

## Social Impact Assessments in India:

- In India, SIAs were mandated in 2013 by The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act.
- According to the 2013 land acquisition law, any major project is required to conduct an SIA within six months of the project's start date.
- By mandating SIA Government aims to decrease social unrest over uncompensated land acquisition and to speed up the execution of development projects, and to ensure that locals receive proper resettlement packages and those developers constructively engage with local communities.
- We have many examples of projects where government conducted SIA. One example is recent Social Impact Assessment Study for Nuclear Power Projects in Andhra Pradesh.

However, while SIAs may benefit some landowners affected by land acquisition, some have blamed SIAs for slowing down development projects by drawing out the land redistribution process.

Many development projects remain stalled, often due to bureaucracy and complications involving land acquisition.

## **Conclusion:**

SIAs can be resource and time-intensive, which leads some business owners to view them as bureaucratic red tape. However, considering the ethnic diversity and Agriculture as



dominant occupation, SIAs remain an important part of the investment process in India that cannot be overlooked.

**Best Answer: Dazy Rani**

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**Lucky Verma**

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**44. What measures both preventive and mitigative can be taken to address the ecological hazard of droughts? Suggest.**

**Introduction:**

Drought is a slow onset disaster, which gradually evolves over months and years due to complex interactions of environmental and anthropogenic factors.

Typically, the reason behind drought is considered to be prolonged period of abnormally low rainfall leading to shortage of water. But low rainfall is not the only contributing factor.

**Body:**

Drought impacts are often multifaceted social, economic and environmental.

Economic impacts:

- Reduced agricultural production leading to reduced harvest and thereby reduction in the earning.
- Increased cost of farm maintenance due to the additional costs of water provisions and other resources to the farm products (including the reduced usage of fertilizers/chemicals leading to lesser output).
- Loss of livelihood for marginal farm workers.

- Increasing cost of maintaining livestock due to shortage of fodder and drinking water.

#### Social Impacts:

- Drought has serious impacts on health and social safety.
- Nutritional concerns due to poor quality diet and allied health problems, loss of human lives in the extreme scenario.
- Increasing outmigration in search of alternate jobs to urban areas, which in turn increase the vulnerability of migrants as they settle/ squat in risky areas/ unhygienic conditions.
- Increasing child drop-out rates and child labour.
- Early marriage of daughters to reduce financial burden and the linking of non-marriage of daughters to the drought occurrence.
- Increased stress and anxiety resulting in increasing incidences of farmer suicide.
- Conflicts over water resources.

#### Environmental impacts:

The most severe impact of drought is upon the environmental resources. Often droughts result in extensive damage to flora and fauna of a region. The significant impacts include:

- Increased animal attacks in farm areas due to lack of food in their own habitats.
- Loss or destruction of fishes and aquatic organisms.
- Lack of adequate food and drinking water in forests and in extreme cases resulting in loss of wildlife.
- Migration of wild animals thereby increasing human-animal conflicts.
- Weak and diseased animals.
- Loss of wetlands and increasing incidences of wildfires.
- Degradation of soil quality and soil productivity.
- Increased erosion and desertification rates.
- Drought management guidelines as given by National Disaster Management Authority

Preventive measures: identify drought prone areas and channelize efforts to augment water supply and conservation in these regions through

- Judicious use of surface and groundwater.
- Cloud seeding in Drought Prone regions of India.
- Use of modern irrigation methods like drip and sprinkler irrigation.
- Water Conservation, Storage Structures and Management.
- Afforestation.

Mitigation measures:

- Contingency Crop Planning – It aims to provide other cropping options to farmers like drought resistant crops.
- Relief Employment – Due to drought induced employment loss, the arrangement can be made for relief employment programmes with cash and food grain assistance.
- Gratuitous assistance in the form of cash or food grains to people who might not be able to participate in the relief employment programmes or who are in the category of dependents.
- Relief through Tax Waivers and Concessions will help people to meet their basic entitlements.
- Cattle camps and Fodder supply helps farmer in protecting their cattle by providing necessary assistance for their fodder, feed and health. This is done to discourage distress selling of cattle which is an important asset to farmers.
- Crop Insurance schemes.

Note: Question demands only Preventive and Mitigation measures.

### **Conclusion:**

As per the rough estimates about 16 percent of the total geographical areas of India are drought prone and approximately 50 million people are annually affected by droughts. About 68 percent of the total sown area of the country is drought prone; which amounts to 329 million hectares. As erratic Indian monsoon gets further affected by climate change, water conservation through comprehensive strategy needs a focus to address recurring droughts in future.

**Best answer: Sreelakshmy Vijayan Uma**

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**45. What are the principles, objectives and strategies of environmental impact assessment (EIA)?**

**Introduction:**

Environmental assessment is the assessment of the environmental consequences of a plan, policy, program, or actual projects prior to the decision to move forward with the proposed action.

### **Body:**

There are eight guiding principles that govern the entire EIA process: The principles of EIA:

- Participation – appropriate/timely access for interested parties
- Transparency – open and accessible assessment decisions
- Certainty – process/timing agreed in advance
- Accountability – decision makers responsible for their actions and decisions
- Credibility – undertaken with professionalism/objectivity
- Cost effectiveness – environmental protection at the least cost to society
- Flexibility – adaptable to deal efficiently with any proposal and decision situation
- Practicality – information/outputs readily usable in decision making and planning

Objective of EIA:

The objective of EIA is

- to identify, predict and evaluate the economic, environmental and social impact of development activities
- to provide information on the environmental consequences for decision making and
- to promote environmentally sound and sustainable development through the identification of appropriate alternatives and mitigation measures.

Strategies:

- Screening – is an SIA is required (ex: legislation, policies, requirements), what type of SIA is needed, when is it required.
- Scoping – what is the aim of the PPP, are there any significant strategic issues, who are the stakeholders, what is the current state of the environment.
- Impact assessment – identify all inputs into the SIA, constraints, project impacts, opportunities and trends, develop objectives, criteria and indicators.
- Developing parameters, principles or guidelines – these are used to guide the SIA process and can include recommendations on addressing environmental or socio-economic impacts.
- Comparing and evaluating alternative PPPs – preferred alternative/s selected, trade-offs made, public participation sought.
- Decision-making – responsibilities and accountabilities assigned, SIA process is checked, final decision documented.
- Monitoring and review – develop an implementation plan, begin monitoring and review of the project.

- Implement the selected proposal.

### **Conclusion:**

Hence environment impact assessment is basically a feedback process to maintain social, economic and environmental sustainable development.

### **Best answer: Mudrarakshas**

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### **46. Analyse the issue of cross border terrorism in India? Why do certain external state and non-state actors adopt terrorism as a non-conventional tool of warfare? Discuss.**

#### **Introduction:**

Conventional wars are not the norms or strategic choice for state on state conflicts due to huge cost and collateral damages. As a result, grey zone conflicts, which fall in duality of neither war nor peace, are becoming new arena of strategic competition between states. Cross border terrorism is a conflict that falls in the category of grey zone conflict. It is an undeclared war and considered to be highest form of strategy to bleed a nation for prolonged period by small efforts. It is an asymmetric war strategy employed by an adversary at a point in time when it cannot compete on a traditional battlefield, and adversary looks to where you are vulnerable. In this war the principle followed by an adversary is to avoid going at the enemy blow by blow, strength against strength since it is considered un-strategic. India has unresolved borders with two of its nuclear neighbours and surrounded by politically, economically and militarily unstable nations. The state and non-state actors have taken advantage of such a scenario to cause military and economic friction to weaken India internally.

#### **Body:**

Factors giving impetus to cross border terrorism (Extra part –Not needed in this answer)

- Geography assists in border transgression and infiltration of terrorists. Proximity of vulnerable areas to a rogue nation ensures continuous flow of terrorists and war like support to sustain momentum of conflict.

- Identical ethnic demography gives support and sustenance to the terrorists during and post infiltration.
- Political patronage to terror movement is provided by network of unarmed terrorists, over ground workers and separatists so that they can establish linkages and identity with the larger population of a community.
- Poor and corrupt governance gives space for non-state actors to create a conducive environment on ground for making it a popular mass movement.
- Subverted government institutions give impetus by their inactions and inability to protect vital public space.
- Unsettled borders, competing strategic interests, unstable or ungoverned territories in the neighbouring countries and spill over effect of communal or religious conflict in these countries also adds to the vulnerability from cross border terrorism.
- Illegal and mass displacement of population due to communal and economic reasons also adds to the vulnerability.
- Children of war or conflict are easy cannon fodder and can be motivated to pursue the agenda of state and non-state actors.
- Lack of stability and contiguous land border with hostile nations is one of the major causes of cross border terrorism.
- Most important is the factor of availability of willing terror recruits. Ideal situation is when the terror recruits are available on both sides of the international borders. The case of J&K is an apt example where you have terror factories on both sides and they operate in tandem with each other.
- The motivation for terrorists on both sides is different, foreign terrorists join the conflict due to religion, economic reasons, and identical ethnic affiliation. The domestic terrorists in addition to the factors attracting foreign terrorists is also due to political alienation, personal failure and an escape route for redemption in society and to fight for self-determination/ homeland.
- Nexus between drug cartels, gun runners and terror organisations give a source of funding and sustenance.

The motivation for involvement of a foreign power to continue with the cross border terrorism or proxy war comes from the fact that fighting wars is uneconomical, but it is always a wise course of option to make the opponent waste as much of the resources as possible. Cross border terrorism does give adversary deniability and no collateral damage as a blow back impact. Thus, it is a cheap war to achieve high dividends at low risk. Cross border terrorism is considered to be part of grey zone conflict; with the passage of time these conflicts are becoming sophisticated and complex. There is a possibility that cross border terrorism if not handled with efficiency and precision could go on to become a hybrid war.

Reasons why State adopt these methods:

- The high cost of modern, conventional warfare make using non-state actors an attractive choice, financing terror groups is a small portion of states' much larger defence budget, making terror proxies a convenient and viable option.
- Use of terror organisations divorces the state from issues related to attribution, thereby ensuring that the state is not held politically or legally responsible.
- International pressure to negotiate and sanctions in case of refusal
- Internal pressure: The perception battle with its own citizen is lost if indulged in traditional warfare.

Non state actors adopting these methods:

- 1) Lack of manpower and money to engage in traditional warfare
- 2) Lack legitimacy and popular support
- 3) Source to weaken legitimately chosen government

### **Conclusion:**

The cross border terrorism is being handled by multiple agencies operating under different ministries, as a result the entire efforts of fighting cross border terrorism lacks synergy. Intelligence agencies and Central Armed Police Forces are operating under Ministry of Home Affairs, Army under Ministry of Defence and police under state government. All operations of critical nature must be handled under single operational command that has the resources and capability to influence the outcome of operations.

### **Best Answer: Another Being**

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### **47. The geography of the border areas makes border management a complex challenge in India. Comment.**

#### **Introduction:**

India shares approximately 15000 km long land border with its neighbours along with a 7500 km long coastline. The length of its border alone presents a huge task for border management, which is aggravated by the unique geographical challenges it has along every border area.

## Body:

How geography makes border management complex:

- Mountains- Along the North, mountains make the terrain difficult to reach and maintain borders. Also extreme temperatures like in case of Siachen glacier prevents serves as deterrence for effective management.
- Deserts- Thar Desert along the western border and the Cold Desert of Ladakh along northern border possess unique issues of accessibility.
- Marshlands- The marshlands of Rann of Kutch along Indo-Pak border and Sunderbans along India-Bangladesh border makes it difficult to fence and are among the hotspots for infiltration.
- Forests- The terai low land along India-Nepal border and dense forests along India-Myanmar border makes it difficult for the security forces to man the border efficiently and proves to be a hindrance in surveillance.
- Rivers- Fast flowing rivers along Pakistan and Bangladesh borders makes it difficult to fence and the changing river courses creates border disputes.
- Sea- The long coastline hinders the ability to have all around surveillance and can be easy to infiltrate as happened in the case of 26/11 Mumbai attacks.

Use of modern technology like Unmanned Aerial Vehicles, laser light, thermal vision can help aid surveillance in otherwise difficult to reach areas. Border road development can also aid Border management.

## Conclusion:

India sits with two hostile neighbours and a range of Border related issues with other neighbours like infiltration, insurgency, border disputes etc. A sound border management is required to efficiently deal with the range of issues without making geography a hindrance.

## Best answer: Indian

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## 48. Examine the linkages that have evolved recently between terrorism and organised crime.

### Introduction:

Organized crime is a category of transnational, national, or local groupings of highly centralized enterprises run by criminals who intend to engage in illegal activity, most commonly for money and profit.

Activities of organised criminals most commonly include trafficking in humans, illicit goods, weapons and drugs, armed robbery, counterfeiting and money laundering.

Transnational organised crime and international terrorism increasingly share both organisational and operational characteristics, and at times even partner with one another.

Often, the core interest of a criminal group is profitability. On the other hand, the primary interest of a terrorist organisation is driven by political or ideological motivations. However, the nexus between crime and terrorism finds active collaboration between the two.

Body:

A case study of global nexus: Drug Trafficking and Terrorism

- Afghanistan survey report of United Nations Office on Drugs and Crimes (UNODC) estimates indicate that in 2017, opium poppy cultivation increased sharply to an unprecedented record high of 3,28,000 hectares from an estimated 2,01,000 hectares in 2016.
- It is also evident from the report that the markets in Europe and the US, which are the most important consumption source for high quality drugs, have also become the indirect facilitators of terrorism.
- The profits that drug sales help generate for criminal and terrorist groups, allow organisations like the Taliban to emerge as amongst the best funded and richest terror groups in the world.
- UNODC report indicates that, “Drug trafficking groups in Europe are frequently also involved in the counterfeiting of goods, trafficking in human beings, smuggling of migrants and trafficking in weapons.
- This reinforces the trend of mutual benefit between criminal groups in Europe and the Taliban, even if there is no direct linkage between the two.
- India does not figure as a major drug producing country. Incidents of the same are restricted to some areas in the Naxal affected areas and Northeast India. Instead, India is referred to as one of the vital links between the Golden Crescent in the west and the Drug Triangle in the east.

- Border areas along Western India are also prone to smuggling of drugs, often in the form of composite loads. These take place in the form of packages that include not only drugs but also fake currency and weapons.
- The market for these criminal proceeds in India, not only supports the criminal network, but also allows terrorist groups to exploit the same.

Organised crime and terrorism in India:

In the Northeast, extortion is the fundamental basis for funding all forms of terrorism. In addition to this, kidnapping has been used extensively for spreading terror and raising funds. Human trafficking, drug trafficking and gun running are some of the other criminal activities that have been common in these areas.

- In J&K, counterfeit currency has been a major source of funding terrorism.
- In the Maoist terror movements, extortion is yet again a common phenomenon. They have also indulged in robberies of banks to fund their movement. There have also been reports of cuts being enforced on drug yielding crops in the region.
- There are also a number of insurgent groups which over a period of time have morphed into crime syndicates. What began as an ideological movement is now merely a means of generating profit. This is especially the case with insurgent groups in Northeast India.

### **Conclusion:**

Crime, money laundering and terrorism need an ideal breeding ground, which creates the requisite conditions that can facilitate exploitation of structures and systems in place. This is not peculiar for India or South Asia and is a universal condition.

The growing complexity and sophistication of the means, especially corruption and technology, adopted by adversaries, criminals and terrorists alike has changed the character of the threat.

There is need to adopt multipronged approach to break this nexus, by cooperation and coordination between local, national and international policy making.

### **Best answer: Mudrarakshas**

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## 49. How does terrorism affect the socio-economic ecosystem of a country? Discuss.

### Introduction:

Terrorism can be defined as the unlawful use of forces to people and damage of properties to coerce government and society as a whole for a vested social or political interest. Terrorism is a concern for the whole world including India. It affects every section of a Nation impacting its socio economic scenario.

### Body:

Socio- Economic impact of terrorism:

- > Terror led war cause huge loss of life and property (ex: in Syria civil war, Iraq war etc.)
- > Huge funding to prevent terror act reduces fund at disposal of the Government impacting social welfare schemes
- > Terror led unrest impacts basic services like health, education closure of shops etc.
- > Huge burden on economic health of a Nation.
- > Cross border terrorism impacts relation with other Nation impacting Trade, tourism, international prestige etc. (e.g. Pathankot attack, Uri attack in India increased tension between India and Pakistan)
- > Radicalisation of youth and creation of unrest among people (North- East insurgency, Kashmir issues etc.)
- > Spread of communal disharmony for e.g. Muslims & Jews in Palestine
- > Paralyse democratic processes in elections e.g. Afghanistan, Pakistan
- > Increasing unemployment among youth due to lack of investment and industrial activity
- > Increased tension in bilateral relations for ex: India- Pakistan.
- > Security issue of women and children for e.g. sex slaves of ISIS yajidi and Kurd woman
- >Huge refugees putting pressure on a Nation's resources (e.g. Rohingyas in Bangladesh)
- > Children's, women's and elderly people are worst effected leaving them with less opportunity. Ex: Rohingya refugees in Bangladesh, India and Myanmar etc.)

### Conclusion:

Terrorism is a common enemy to all and world leaders should come forward to come up with a concrete framework to deal with it. The CCIT (comprehensive convention on international terrorism) proposed by India in this regard is a step in right direction.

Further India should use leverage various platform like SCO, UN, BIMSTEC etc. to spread awareness of the terror threat and strengths it's preparedness to deal with domestic terror.

**Best answer: Swapnil**

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## **50. What is CERT-In? How does it function? Discuss.**

### **Introduction:**

CERT-In is an acronym for 'Indian Computer Emergency Response Team'. As per Information Technology Amendment Act 2008, CERT-In is the National Incident Response Centre for major computer security incidents in its constituency i.e. Indian cyber community. CERT-In's primary role is to raise security awareness among Indian cyber community and to provide technical assistance and advise them to help them recover from computer security incidents. It functions under the Ministry of Electronics and Information Technology.

### **Body:**

Objectives of CERT-In

- Preventing cyber-attacks against the country's cyber space.
- Responding to cyber-attacks and minimizing damage and recovery time.
- Reducing 'national vulnerability to cyber-attacks.
- Enhancing security awareness among common citizens.

Functioning:

The Information Technology (Amendment) Act 2008 designated CERT-In to serve as the national agency to perform the following functions in the area of cyber security

- Reports- It serves as a central point for reporting incidents
- Repository- It is the national repository for cyber intrusions, as it maintains a database of incidents'.
- Analyse- Analysis of trends and patterns of intruder activity, developing preventive strategies for the whole constituency and taking an in-depth look at an incident

report or an incident activity to determine the scope, priority and threat of the incident are few of the major functions of the body.

- Response- It sends out recommendations for recovery from, and containment of damage caused by the incidents and help the System Administrators take follow up action to prevent recurrence of similar incidents.
- Advise- Provides technical advice to System Administrators and users to respond to computer security incidents.
- Assist and co-ordinate- It works with other similar institutions & organisations to resolve major security issues, and disseminates information to the Indian cyber community.
- Awareness- It enlightens its constituents about the security awareness and best practices for various systems; networks by publishing advisories, guidelines and other technical documents.

### **Conclusion:**

CERT-In thus helps strengthen security related defence of Indian internet domain, while also responding to the cyber threats.

### **Best answer: Dazy Rani**

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### **51. What do you understand by paramilitary forces? What role do they play in India's internal security? Examine.**

#### **Introduction:**

Paramilitary forces are key players in internal security and integrity of a country. In India's seven paramilitary forces are collectively called as Central Armed Police Forces. These are:

- Assam Rifles (AR)
- Border Security Force (BSF)
- Central Industrial Security Force (CISF)
- Central Reserve Police Force (CRPF)
- Indo Tibetan Border Police (ITBP)
- National Security Guard (NSG)

- Sashastra Seema Bal (SSB)

## Body:

What is Paramilitary Force?

A paramilitary is a semi-militarized force whose organizational structure, tactics, training, subculture, and (often) function are similar to those of a professional military, but which is formally not part of a government's armed forces.

Role Played by Paramilitary Forces:

- Assam Rifles remains deployed in some of the most remote and under developed areas and provides security to locals. The humane, just and ever helpful approach of the men of Assam Rifles has truly managed to win hearts and minds earning the Assam Rifles the sobriquet of 'Friends of the North East'.
- The Border Security Force (BSF) is a Border Guarding Force of India. They are rightly declared as "First Wall of Defence" for India.
- Central Industrial Security Force (CISF) is mandated to provide security to major critical infrastructure installations of the country in diverse areas. CISF is currently providing security cover to nuclear installations, space establishments, airports, seaports, power plants, sensitive Government buildings and ever heritage monuments. Among the important responsibilities recently entrusted to the CISF are the Delhi Metro Rail Corporation, VIP Security, Disaster Management and establishment of a Formed Police Unit (FPU) of the UN at Haiti.
- To enable the government to maintain Rule of Law, Public Order and Internal Security effectively and efficiently, to Preserve National Integrity and Promote Social Harmony and Development by upholding supremacy of the Constitution, are part of the mission of Central Reserve Police Force (CRPF). They are deployed almost all over India with wide mandate of internal security. The CRPF had to be inducted in strength not only to maintain law and order but also to keep lines of communication free from disruption. The commitments of the Force continue to be very high in the North-East in dealing with the insurgency.
- Indo-Tibetan Border Police was raised for reorganizing the frontier intelligence and security set up along the Indo-Tibetan border. They are also entrusted with tasks of border guarding, counter insurgency and internal security roles.
- National Security Guard (NSG) is a Federal, Contingency, World Class, Zero Error Force to deal with anti-terrorist activities in all its manifestations. The NSG is a force specially equipped and trained to deal with specific situations and is therefore, to be used only in exceptional circumstances to thwart serious acts of terror.
- Sashastra Seema Bal (SSB) is mandated with significant role of guarding and intelligence across borders, especially India-Nepal and India-Bhutan. Their roles also include; Safeguard the security of assigned borders of India and promote sense of

security among the people living in border areas. Prevent trans-border crimes, smuggling and any other illegal activities; Prevent unauthorized entry into or exit from the territory of India; Carry out civic action programme in the area of responsibility; Perform any other duty assigned by the Central Government. (SSB is being deployed for Law & Order; Counter Insurgency Operations and Election duty)

- Disaster Management: Most of these (but not all) paramilitary forces also play their role in disaster management, not only inside the country but also along the borders during disasters in neighbouring countries such as Nepal earthquake of 2015.
- UN peace keeping force: CRPF, CISF, ITBP and such other forces are sent overseas as part of UN peace keeping missions across the globe.

### **Conclusion:**

After observing above specific and common functions of India's paramilitary forces, it can be said that, paramilitary forces play their role in almost all the critical matters of internal security, from riots and insurgency to terrorism and smuggling. They are also an important part of defence intelligence required for internal security and integrity of India.

### **Best Answer: Gurpreet Singh**

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### **Gargi Gupta**

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## **52. Discuss the institutional framework of disaster management in India.**

### **Introduction:**

India has been traditionally vulnerable to natural disasters on account of its unique Geo-Climatic conditions. Floods, Droughts, Cyclones are recurrent phenomenon. Development cannot be sustained unless disaster events are effectively managed.

### **Body:**

The Disaster Management Act, 2005 deals with the management of disasters. This act envisaged a three tier Disaster Management structure in India at National, States and District levels. Under the act, the NDMA, SDMA, NEC, NDRF, NIDM and disaster related funds were established.

Institutional structure for disaster management is hierarchical and functions at three levels – centre, state and district. It is a multi-stakeholder setup, i.e., the structure draws involvement of various relevant ministries, government departments and administrative bodies.

#### National Disaster Management Authority (NDMA)

- Is a National Authority responsible for laying down the policies, plans and guidelines for disaster management and for ensuring timely and effective response after disasters.
- It consists of nine members with prime minister as its ex-officio chairperson.

#### National Executive Committee (NEC)

- NEC is responsible for assisting NDMA in execution of various functions for disaster management like Implementing the plans and policies of NDMA; Ensuring compliance with the directives of Central Government; To act as a coordinating and monitoring body for disaster management; Prepare the National Plan to be approved by the NDMA; Prepare guidelines for different ministries with respect to disaster management.

#### State Disaster Management Authority (SDMA)

- A state Disaster Management Authority is established by every state government.
- The Chief Minister of the state is the chairperson of SDMA. There are maximum 9 members other than the chairperson.

#### State Executive Committee (SEC)

- The state government also creates a State Executive Committee to assist the State Authority in the performance of its functions and to coordinate action in accordance with the guidelines laid down by the State Authority and ensure the compliance of directions issued by the State Authority.
- Its powers and functions are almost a replica of the NEC at state level.



### District Disaster Management Authority (DDMA)

- The DDMA are set up by state government via a notification in the state budget. It consists of Chairperson and seven members. The collector or District Magistrate or Deputy Commissioner would be the chairman.
- The DDMA works as a district planning, coordinating and implementing body for disaster management.
- It will coordinate with the upper two tiers of the structure and will plan the implementation of the prevention, mitigation and preparedness at local level.

### National Disaster Response Force (NDRF)

- For the purpose of specialist response to a threatening disaster situation or disaster. The general superintendence, direction and control of the Force shall be vested and exercised by NDMA.

### National Disaster Response Fund

- For meeting any threatening disaster situation or disaster. The central government will be able to use the money from this fund to meet expenses for emergency response, relief and rehabilitation.

### National Institute of Disaster Management (NIDM)

- It is responsible for planning and promoting training and research in the area of disaster management.
- It is a premier national organization working for human resource development at national level in the area of disaster management.

### **Conclusion:**

Ineffectiveness in preparedness and coordination, lack of implementation capacity at state level, not constituting Disaster Mitigation Fund, inadequate technology and manpower remain as challenge in Disaster Management. Challenges needs to be addressed to reduce vulnerability and achieve disaster resilience.

### **Best answer: Krishnakant**

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### 53. How can NATGRID help in securing a peaceful territory? Comment.

#### Introduction:

NATGRID is a post Mumbai 26/11 attack measure. It aims to mitigate a vital deficiency — lack of real time information, which was considered to be one of the major hurdles in detecting US terror suspect David Headley's movement across the country during his multiple visits between 2006 and 2009.

#### Body:

Role of NATGRID in securing territory

- NATGRID is an ambitious counter terrorism programme, which will utilise technologies like Big Data and analytics to study and analyse the huge amounts of data from various intelligence and enforcement agencies to help track suspected terrorists and prevent terrorist attacks.
- It will connect, in different phases, data providing organisations and users besides developing a legal structure through which information can be accessed by the law enforcement agencies.
- NATGRID will become a secure centralised database to stream sensitive information from 21 sets of data sources such as banks, credit cards, visa, immigration and train and air travel details, as well as from various intelligence agencies.
- The database would be accessible to authorised persons from 11 agencies on a case-to-case basis, and only for professional investigations into suspected cases of terrorism.
- NATGRID is essentially a tool that enables security agencies to locate and obtain relevant information on terror suspects from pooled data of various organisations and services in the country. It will help identify, capture and prosecute terrorists and help pre-empt terrorist plots.
- NATGRID would also help the police and the Intelligence Bureau keep a tab on persons with suspicious backgrounds. The police would have access to all his data and any movement by this person would also be tracked with the help of this data base.
- The danger from not having a sophisticated tool like the NATGRID is that it forces the police to rely on harsh and coercive means to extract information in a crude and degrading fashion. After every terrorist incident, it goes about rounding up suspects—many of who are innocent. If, instead, a pattern search and recognition system were in place, these violations of human rights would be much fewer.

### Criticisms:

- NATGRID is facing opposition on charges of possible violations of privacy and leakage of confidential personal information.
- Its efficacy in preventing terror has also been questioned given that no state agency or police force has access to its database thus reducing chances of immediate, effective action.
- According to few experts, digital databases such as NATGRID can be misused. Over the last two decades, the very digital tools that terrorists use have also become great weapons to fight the ideologies of violence.
- The Snowden files have already revealed the widespread misuse in recent years of surveillance capabilities to compromise individual privacy and even violate national sovereignty.

### Conclusion:

In its present form, NATGRID suffers from few inadequacies, some due to bureaucratic red tape and others due to fundamental flaws in the system. If the government takes enough measures to ensure that information does not fall through the firewalls that guard it, NATGRID has the potential to become India's go-to grid for a 360-degree perspective to prevent and contain crises

### Best answer: Amit

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