

# State PCS Success Program (SPS)

UPPSC (Mains) - 2022

GS Paper #3 - Solution



### **Instruction to Students**

Answers provided in this booklet exceed the word limit so as to also act as source of good notes on the topic.

Candidates must focus on the keywords mentioned in the answers and build answers around them. Elaborate answers are given with the purpose that candidates understand the topic better.

We have also adopted a grey box approach to provide context wherever necessary, which is not to be considered a part of the answer.

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**Q.1) Climate change is a threat to food and nutrition security of the world. Examine the impact of climate change on agriculture. Suggest ways to make agriculture sustainable and climate resilient.**

**Model Answer:**

Climate change is any significant long-term change in the expected patterns of average weather of a region (or whole Earth) over a significant period. **Anthropogenic activities such as industrialization, urbanization, deforestation, etc.** have increased the rate of climate change and started to affect agricultural productivity and food and nutritional security.

**Impact of climate change** on agriculture:

1. **Low production:** Climate change will lead to low crop productivity. Increased temperature **leads to loss of moisture from the soil** affecting soil fertility and lowering yield. According to the **Turn Down Heat Report (World Bank)**, crop production in South Asia would reduce by at least 12% by 2040.
2. **Increased risk to crops:** There will be **increased risk of pests and disease** on crops due to change in the pattern of host and pathogen interaction as tropical climate extends poleward. There will also be **increased risk of floods, droughts and forest fires**, forcing many species to vanish and altering food cycle.
3. **Impact on water-availability:** Reduced water availability due to changes in precipitation levels and falling groundwater tables will aggravate water-stress.
4. **Negative impact on livestock:** Livestock of tropical regions would become more prone to **infectious and parasitic diseases** due to increased rate of reproduction, multiplication and mutation of **pathogens and tropical insects in colder latitudes**. Livestock's productivity would decline as a result.
5. **Food security and agricultural economy:** According to a **Lehman Brothers report**, for every two degrees rise in temperature, the agriculture **GDP of India will reduce by further 5%**. Poor agricultural performance will **lead to inflation and farmer distress, impacting food security and economy**. It could turn India into a major importer of oilseeds, pulses and even milk.

**Following measures** can help in making agriculture sustainable and climate resilient:

1. **Tolerant crops:** Crops with prolonged shelf-life **resistance to biotic and abiotic stresses, such as droughts, floods, disease, etc.** are needed. In **Aurangabad (Maharashtra)**, early maturing and drought-tolerant cultivars of **green gram, chickpea and pigeon pea** provided 20-25% higher yield than the indigenous cultivars.
2. **Tolerant livestock and poultry breed:** Use of indigenous breeds like **Rathi, Tharparkar, Red Sindhi, etc.** should be promoted. They are **adapted to specific Indian eco-system**, can walk long distances, are **resistant to droughts and diseases**.
3. **Water management:** Water-smart technologies like **micro-irrigation, rainwater harvesting, cover-crop method, laser land levelling, etc.** can support farmers to efficiently manage irrigation.
4. **Agro-technology:** Various technologies based on a **precision estimation of crop water needs, groundwater recharge techniques and adopting zero-tillage** can help farmers to reach satisfactory crop yields, even in deficit rainfall and warmer years.
5. **Response farming:** Response farming can be a viable choice for climate change adoption strategies. It is an integrative approach which involves farming with **advisories taken from the technocrats depending on local weather information**. The success of response farming, viz., **decreased danger and enhanced productivity** has already been seen in Tamil Nadu.

Climate change will impact agriculture significantly. **Reduction of greenhouse gas and emissions from all agriculture and non-agricultural sources** must be prioritized. **Implementing Climate Resistant Agriculture** across the country is the need of the hour. **Collaboration between farmers, research institutions, governments, NGOs and private sector** is needed.

**Q.2) What is e-RUPI? Compare e-Rupi with government backed cryptocurrency. How can e-RUPI improve governance and ensure better service delivery?**

**Model Answer:**

e-RUPI is a onetime **contactless, cashless voucher-based mode of payment**, redeemable at designated centers without the need for any credit/debit card, digital payments app, or internet banking access, thus **eliminating any physical interface**.

It was launched by government with aim to further **ease of living and allow payment for a wide range of government services**. e-RUPI is different from recently announced government backed cryptocurrency in following ways:

e-RUPI	Government backed cryptocurrency (GBC)
e-RUPI is a voucher formally <b>backed by the Indian currency</b> as an underlying asset.	GBC will be a <b>digital currency like bitcoin</b> , with no underlying currency as asset.
It is a <b>person and purpose specific pre-paid voucher</b> in the form of an SMS or QR code.	It is <b>not person and purpose specific</b> and will be in form of digital currency.
It is <b>not based on any specific technology</b> like blockchain.	It is <b>developed on and based on blockchain technology</b> .
Via e-RUPI, <b>no new money is being created</b> . Money is already available with the benefit provider which it wants to transfer to the platform for the beneficiary.	GBC will <b>lead to creation of new money</b> into circulation in form of digital asset, and thereby will increase inflation.

e-RUPI can improve governance and ensure better service delivery in following ways:

- Accessibility:** e-RUPI enable enhanced accessibility, as the beneficiaries **need not to have internet banking access, a smartphone, a card or even a bank account** to avail the services. **It will result in higher adoption rates in rural areas and among economically backward sections.**
- Timely payment:** Being pre-paid in nature, it will assure **timely payment to the service provider** without the involvement of any intermediary.
- Implementation of schemes:** Due to close involvement of various ministries in its development, the immediate use case of the new system could be well-placed in **delivering timely and leak-proof transfers under schemes that cover mother and child welfare, fertilizer subsidies, drugs and diagnostics under various schemes.**
- Ease of doing business:** The private sector can leverage this system for their **employee benefit and corporate-social welfare programs**, thereby benefiting both labor and business enterprises.
- Last-mile delivery:** e-RUPI will expedite the **targeted, transparent, and leakage-free delivery to the endpoint**. It will foster financial inclusion and will ensure that **government services reach the list mile beneficiaries without leakage of benefits/funds.**

e-RUPI is a next step towards digitalization of the country. It will help further in **plugging gaps in digital payment infrastructure** based on the e-RUPI experience, which will go a long way in helping it develop a **Central Bank Digital Currency** and ensuring its success. It has potential of **enhancing governance and improving delivery of various government services** in a transparent way.

### Q.3) Inclusive growth is both a process and an outcome. Discuss in Indian context.

#### Model Answer:

UNDP defines Inclusive growth as **the process and the outcome** wherein **all groups of people participate** in growth and **benefits of growth are shared equitably** among them.

**Growth produces inclusion as an outcome** in following ways:

1. **Employment generation:** Economic growth produces jobs and provides livelihood opportunities. India **lifted 271 million people out of poverty in the high growth phase** between 2005-06 and 2015-16.
2. **Redistribution:** Economic growth creates resources for the government through taxation which are deployed for **welfare schemes** targeted at vulnerable sections such as in public education, health & sanitation, skill development programmes etc.
3. **Intergenerational development:** Livelihood generation provides **financial capacity and awareness about availing education** opportunities, improving **health and nutrition** which have inter-generational effect on ending poverty.

However, challenges like **unemployment reaching an all-time high (Periodic labor force survey)**, low **female labor force participation** rate, **disguised employment** in agriculture sector and **lack of opportunities** in manufacturing sector have laid bare the promise of inclusion.

It is estimated that after the **economic reforms of 1991, economic inequality has increased** in India. As per Oxfam, 10% Indian hold 77% of the total national wealth. Thus, it has been argued that **inclusion needs to be made a part of the growth process** itself, such as:

1. **Giving proper political representation:** In India, **constitutional provisions and political developments** have helped in increasing the representation of backward sections of the society. The government **schemes are designed to provide inclusive development** as otherwise people can vote out the government.
2. **Satisfaction of food, health and nutritional needs:** Expanded coverage of public distribution system **under National Food Security Act 2013, universal immunization** programme, and similar other initiatives in social sector are example of inclusive growth as these measures have helped the country **move towards zero hunger**, and in developing better **human capital**.
3. **Educational equality and skill development:** Programmes such as **Sarva Siksha Abhiyan** have helped achieve almost 100% Gross Enrolment Ratio (GER) and gender parity in primary education. **Samagra Siksha Abhiyan** has been launched to address gaps in achieving universal education.
4. **Good Governance:** Corruption **affects growth of businesses**, and undermines **equitable redistribution of growth's** benefits. Good governance helps provide **level-playing field in economy**, prevents the **misuse of public funds** and authority by ensuring transparency and accountability.
5. **Financial Inclusion:** Access to financial services to vulnerable groups at affordable cost through **the Pradhan Mantri Jan Dhan Yojana** has helped in **promoting the culture of savings**, which initiates a virtuous cycle of economic development.

But despite the inclusive outcome as well as inclusive process of growth, issues such as prevalence of **malnutrition**, high out-of-pocket **expenditure on health**, dropout rate in **school education, poor learning** outcomes remain. Recent pandemic has seen large number of **people falling back in poverty**. India has come a long way in its development journey, the challenges of inclusive growth still remain. Improvement in public health and education facilities, providing industry-oriented skill development, development of backward area (with schemes like **Aspirational District Programme** etc.), giving **due importance to environment** etc. will help in making the growth process more inclusive.



**Q.4) Explain the cooperatives of Uttar Pradesh and discuss their role in the economy of the province.**

**Model Answer:**

UP has **2nd largest number of cooperative societies** in India. Cooperatives in UP are **governed under the UP-Co-operative societies act**. Due to their democratic organization and economic orientation, they play **crucial role in economy of province**. For example- "**Sahakari Samitis**" are formed by local people organized under organization for **sharing of benefit and cooperation**. Head of samiti is elected from amongst members of samiti. **Role of cooperatives in economic growth of Uttar Pradesh:**

1. Cooperatives contribute significantly to **social integration, job creation** and the reduction of poverty. Cooperatives are thus **stabilizing regional economic cycles** and can generate regional employment.
2. It provides **agricultural credits and funds** where state and **private sectors have not been able to do very much**. For Eg- **UP Kisan Development Cooperative Society** has played crucial role in protecting farmer's interest.
3. It provides **strategic inputs for the agricultural-sector; consumer societies** meet their **consumption requirements** at concessional rates.
4. It softens the **class conflicts** and reduces the **social cleavages**, thus enabling **collective and amicable resolution** of disputes.
5. It helps in **overcoming the constraints of development for small businesses**. It creates a **conducive environment for small and cottage industries**, by deepening **forward/backward linkages**.

**Challenges** faced by Cooperative's sector:

1. **Poor implementation of Cooperative Legislations:** Cooperatives is a State subject under the Constitution of India and **State cooperative laws and their implementation** vastly remains inadequate.
2. **Irresponsibility and Unaccountability:** Serious **inadequacies in governance** including that related to **Boards' roles and responsibilities**. **Lack of Recognition:** A general **lack of recognition of cooperatives** as economic institutions both amongst the policy makers and public at large.
3. **Lack of Awareness:** People are **not well informed** about the **objectives of the Movement, rules and regulations** of co-operative institutions.
4. **Mismanagement and Manipulation:** A hugely **large membership** turns out to be **mismanaged due to political influence**, in the cooperatives.

To strengthen the cooperatives there should be market linkages for agricultural farmers as well as cooperative societies. Cooperatives have a futuristic role of **fostering collectivism and preserving the social capital base** of the country.

**Q.5) The Horticulture sector, though has potential to transform agriculture landscape of country, is beset with several challenges. Examine.**

**Model Answer:**

Horticulture is a **branch of agriculture** that deals with the cultivation, production, and marketing of vegetables, fruits, flowers, herbs, or exotic plants, etc. Horticulture comprises **17% of the 140 million hectares of agricultural land** in India. Horticulture crops also contribute to **30% of the Agriculture GDP** in India.

### Role of Horticulture in transforming the Agricultural landscape:

1. **Remunerative and income accelerator:** As per **Ashok Dalwai Committee**, horticulture can play vital role in **doubling the farmer income**. Horticulture crops have **low input costs**, high productivity and fetch **high market value**.
2. **Boost to food processing industry:** India ranks first in the world in the production of **ginger, bananas, mangoes**, and other several fruits and vegetables. Linking Horticulture with the food processing industry can, thus, create **employment opportunities** in both farm and nonfarm sectors.
3. **Easy for unskilled farmers:** Horticulture is relatively easy for unskilled people. It can **tap into the demographic needs** of the country with large number of unskilled and semiskilled people, looking to move out of agriculture. Thus, it can play important role in **poverty alleviation**.
4. **High production:** The production of fruit and vegetable (306.8 million tons) has overtaken the production of food grains (279.5 million tons) in the country since 2012-13. This indicates at the **increasing economic importance** of the horticulture in **contributing to the growth of the agriculture** sector in India.
5. **High-value exports:** The share of the exports earning from Horticulture crops is higher than the earnings from exports of food grain.

However, horticulture sector faces **several challenges** such as:

1. **Agricultural Policy:** Due to continued **bias in agriculture policy towards grain** production such as through **minimum support price**, free electricity etc., horticulture has remained less attractive for farmers.
2. **Inadequate infrastructure:** Lack of good **cold chain storage**, electricity, and transport increases the **wastage** of fruits and vegetables.
3. **Obsolete technology:** The Horticulture sector needs various technologies like **irradiation machines** to boost the shelf life of products. This is missing in the Indian scenario.
4. **High price fluctuations:** Horticulture faces twin challenges of fluctuations in the price of crops and high initial input cost as a comparison to the **food grains**.
5. **Poor market intelligence:** Absence of proper price discovery mechanisms **limits economic gains** for the farmers.
6. **Phytosanitary conditions:** Poor phytosanitary measures in fruits production reduces the **export potential of Horticulture**.

Schemes like the **horticulture cluster development program**, and **Mission for integrated development of horticulture** (MIDH) try to address some of the aforementioned challenges. But, to realize the potential of horticulture sector in transforming Indian agriculture, a wider approach covering **infrastructure development, technological advancement, and integrated agricultural policy** is needed.

### Q.6) Bring out the environmental consequences of poor e-waste management.

#### Model Answer:

e-waste refers to **discarded electronic and electrical devices**/components. According to **CPCB**, India produced over 10 lakh tones of e-waste in 2019-20, an increase from 7 lakh tones in 2017-18. This has resulted in **numerous environmental consequences like:**

1. **Health risks:** E-waste when dismantled releases dust and toxic elements into the immediate environment and **affects the health of workers of recycling industries** for example. As per the WHO's report "**Children and Digital Dumpsites**", as many as 18 million children are prone to **improper lung function** and increased **risks of cancer due to E-waste**.

2. **Water pollution:** Water contamination by **heavy metals** due to improper recycling and subsequent disposal of e-waste.
3. **Soil pollution:** Soil is contaminated through direct contact with **contaminants** from e-waste or the **by-products of e-waste recycling**. Contaminated soils **harm microbes and plants** while the pollutants pass on **to humans along the food chain**.
4. **Air pollution:** Discarding electronic products into an open fire releases harmful elements like **carcinogens and neurotoxins** into the air.
5. **Ozone depletion:** Unscientific management of e-waste also results in depletion of ozone layer as gases like HCFC are released from discarded fridge and air conditioners.

To curb these harmful effects of e-waste, the government has taken initiatives like **E-Waste Rules 2011, E-waste (Management) Rules 2016, Swachh Digital Bharat**. Some **states** such as Madhya Pradesh have launched an **e-waste clinic** in Bhopal for effective management of e-waste.

However, India continues to have **poor recycling capacity of e-waste because:**

1. **Dumping of waste:** India has become a **destination of the hazardous and industrial wastes** like mercury, electronic and plastic wastes from US and EU. **Capacity creation has not been able to keep up** with the enormous demand for waste-handling.
2. **Legal loopholes:** E-waste rules are violated regularly, for instance, there is **no mechanism to verify** whether all companies have achieved their **EPR targets**, verification is only done through **random checks by CPCB**.
3. **High disposable income** of people coupled with falling prices of electronic devices and **shorter replacement cycle** of electronic gadgets is increasing the volume of e-waste.
4. **Informal sector:** Over **95% of e-waste** produced is managed by the unorganized sector who prefer to **dismantle** the waste rather than recycling it.
5. **Lack of incentive for consumers** to dispose of e-waste in an environmentally friendly manner, for example: **very few buy back options** for older electronic devices.

Government must take steps towards the **formalization of the e-waste sector** by providing **green skills** under the green skill development programs. Also, steps like more **research and development**, robust **infrastructure**, awareness programs to **encourage reuse/recycle** among consumers could help in reducing the e-waste.

**Q.7) Examine the advantages of the cultivation of millets because of which the year 2023 has been declared as the International Year of Millets (IYOM) by the UN.**

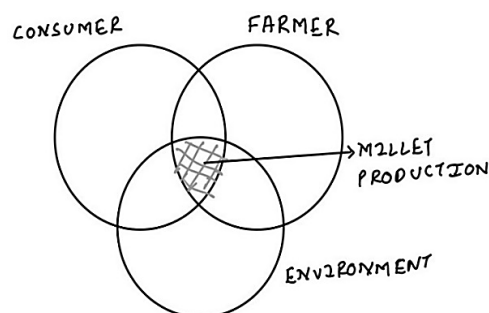
**Model Answer:**

Millet is a group of **coarse grain cereal crops** grown in **arid and semi-arid regions** for human consumption and animal fodder. Examples of **prominent millets** include bajra (pearl millet), ragi (finger millet), jowar (sorghum), buckwheat, foxtail millet etc. Millets hold a significant position in agriculture due to which 2023 is declared as the International Year of millets by the UN.

Cultivation of millets has a **trinity of advantages**, for **farmers, consumers and environment**.

Millet cultivation is **advantageous for farmers** because:

1. Millet cultivation can help to **curtail farmer indebtedness** as it is a **low investment crop**. It can be grown on poor soils with little external inputs like fertilisers or irrigation. E.g., **dryland farming** of millets in the dry interiors of Deccan plateau.



**Fig: Harmonious synergy of millet production**



2. **Sustainable farm income:**
  - a) Millets are **drought-resistant, hardier** crop (resistant to pests and disease). There is lesser possibility of crop failures even during droughts.
  - b) Millets are **short duration crops** (60-90 days). **Crop rotation** is possible leading to **regular farmer income**.
  - c) Millets support **animal husbandry** as they are used as **fodder** for livestock.
3. **Value addition** through **processing** of millets to millet cookies, ragi chips, multi-grain breads ensure **economic gains for farmers of drier regions**.
4. They improve **nutrition security** for farm households.

Millet cultivation is **advantageous for environment** because:

1. Millets have **low carbon-footprint** and **water footprint**. They require 3.5 times less water than paddy.
2. As **climate-resilient crop**, they are part of **adaptation solution** to climate change.
3. Millets help in **restoring soil fertility** by fixing atmospheric nitrogen and promoting the growth of healthy soil microbes.

Millet cultivation is **advantageous for consumers** because:

1. Millets help in **combating lifestyle diseases** like diabetes, cardiovascular problems as millets are gluten free and have a **low glycemic index (GI)**
2. Millets ensure **nutritional security** by addressing **micronutrient deficiency** also known as **hidden hunger**. This is because millets are rich in micronutrients like calcium, iron, zinc, iodine etc as well as amino acids and food bioactive compounds, making them '**super-cereals**'.
3. Millets are **less expensive** compared to wheat and rice, providing **equitable access** to nutrition.

Despite the multi-pronged advantages of millet production, millets are called as "**orphan crops**" due to lack of attention and neglect. Declaration of **2023 as International Year of Millets by UN**, follows similar declaration by India in past, marking **2018 as the National Year of Millets**. These measures at national and international level need to be backed by ground-level action to provide the much-needed thrust for **Millet Revolution**.

**Q.8) What is inflation? Explain various reasons for high inflation and measures to control it.**

**Model Answer:**

Inflation refers to a **sustained or continuous rise in the general price level** of goods and services (taken as a **collective a basket**, and not individually) in an economy **over a period of time**. Inflation in an economy could be **because of one of the following reasons**:

1. **Cost pull inflation:** When price rise because **aggregate supply in the economy declines** or is lower than the aggregate demand of goods and services due to factors such as **increase in the production cost**.
2. **Demand pull inflation:** This type of inflation occurs when the **aggregate demand in the economy is greater than the aggregate supply** of goods and services in the economy.
3. **Structural inflation:** Structural inflation occurs due to various **structural weaknesses** such as **poor logistics, infrastructural bottlenecks, and resource constraints** etc., in the economy.

Various reasons for high inflation in the economy are as following:

1. **Increasing domestic demand:** Economic activities returning to normal, after the pandemic shock, has led to demand-pull inflation.

2. **Food Inflation:** Due to **rising input costs**, such as **increase in diesel and electricity prices**, is a factor behind **high inflation in the country**.
3. **Rising import costs:** India's high inflation is due **increase in import costs** such as:
  - a. **Rise in global crude oil prices**, of which India is a major importer, is a major factor in causing high inflation.
  - b. **Rise in price of vegetable oil**, major import item, reached a decadal high in April 2021, shooting up by almost 57%.
4. **Supply chain disruptions:** There is a rise in commodity prices due to **increasing production cost**. For example, **shortage in semiconductors** globally, have caused a rise in price of electronic goods.
5. **Structural factors:** Structural weaknesses in an economy, such as **poor logistics**, may **increase input cost** causing an increase in the **price of the commodity**.

Steps to check high inflation are:

1. **Monetary policy measures:** Monetary policy is **governed by the RBI**, through following measures:
  - a. **Rise in bank rate:** It results in **reduction of total spending by the individuals**, bringing down inflation.
  - b. **Open Market Operations (OMOs):** The central bank performs **selling and purchasing of government securities** to regulate the credit flow in the economy.
  - c. **Reserve ratios:** It involves **increasing/decreasing the reserve ratios** in order to alter the **credit creating capacity** of the commercial banks.
2. **Fiscal policy measures:** Government employs various fiscal policy measures to control inflation, such as:
  - a. **Slashing wasteful expenditure:** Curbing **unnecessary expenditure** through measures like **subsidy rationalisation, better targeting** etc.
  - b. **Increase in taxes:** Higher taxes **decreases the purchasing capacity of individuals**, by reducing disposable income.
  - c. **Prudent budgeting:** Rationalising the **practice of deficit financing** checks high inflation.
3. **Increase in domestic production:** It is important to reduce the **rising cost of import bills**. For example, atmanirbhar abhiyan.
4. **Price control/rationing:** Government strives to check **unregulated high prices**, and also rations the products through **various import/export regulations**.

Though, inflation is considered as a **necessary evil by many experts**, it is an imperative of the government to **take adequate measures** to check **inflation, inflation targeting framework** through MPC is a step in the right direction.

**Q.9) How have indigenous developments in science and technology impacted the lives of common people in India?**

**Model Answer:**

Right after independence, Pt. J.L. Nehru recognized that **future belongs to those who embrace science and technology**. Development of **indigenous S&T has been a focus** area which resulted in capacities most remarkably in the field of nuclear science and space technologies. Various indigenous developments in S&T have impacted the lives of common people in India in following ways:

1. **Agriculture and allied sector:**
  - a) **Green revolution:** Use of **HYV seeds technology, use of fertilizers and pesticides, better irrigation practices and farm mechanization technologies** brought about a

revolution in agriculture, thus, enhancing the **overall agricultural production** and increasing **per capita food availability**.

- b) **White Revolution: Operation Flood** employed the usage of **enhanced milk production** technology, **vaccinations for better animal health** and **greater productivity** among others to make India the **largest milk producer of the world**, thereby, generating rural employment and fulfilling domestic dairy requirements.
  - c) **Blue revolution:** The **Fifth Five Year Plan (FYP)** introduced reforms in **the fishing sector** through introduction of technologies in **fish breeding, rearing and marketing**, thus, giving a push to the fisheries sector in the country which not only provided livelihood but also food security to people, especially, in the coastal regions.
2. **Computers, digitization and ICT:**
    - a) **Rise of Information Technology:** The rise of Information Technology led to the growth of **Business Process Outsourcing (BPOs)**, **Knowledge Process Outsourcing (KPOs)** and the **software industry** thereby giving a boom to **job creation** in the country.
    - b) **Telecommunication's progress:** The creation of **Centre for Development of Telematics (C-DOT)** for high-level technology development and its access to **private sector** enhanced the **connectivity in rural areas** and brought about a **telecom revolution**.
    - c) **Digital India:** The push for digitalization through access to mobile and internet in recent times has led to positive changes like **e-learning** that helped in continuity during the COVID crisis, **cashless transactions** which led to greater transparency, ease of regulatory processes among others.
  3. **Space technology:**
    - a) **Space technology advancement:** Advancement of space technology has had helped ease the lives of people across various dimensions of life. Development of **VSAT, INSAT, IRNSS, METEOSAT** created scope for applications in areas like **communication, meteorology, navigation**, thus, helping in day-to-day activities.
    - b) **ISRO** has built launching vehicle, satellites for societal needs. It has enhanced assistance in **governance, agriculture, communication, transportation, disaster management, navigation** and so on.
  4. **Nuclear science:** nuclear science has not only assisted in **clean energy generation** but also in development of **nuclear medicine and waste management (NISARGRUNA)**.
  5. **Transportation:** The emergence and technological evolution of various means of **air (affordable flights), land (buses, cabs) and rail transport (metros, locals, high speed trains)** has helped save time and money of the people by ensuring ease of movement.
  6. **Medical science and Emergence of Pharma technology:**
    - a) Advancement in medical technologies and vaccines has resulted in **improved quality of life**, reduced disability adjusted life years (DALY), reduced IMR and MMR, **reduced morbidity** etc.
    - b) India, known as the "**pharmacy of the world**" became so with the technological innovations of government undertakings like **IDPL, CDRI, National Chemical Laboratories (NCL)** and later private sector to provide **affordable medicines** to all.

While technological development has brought about a **revolution across various aspects** of people's lives, there are **negative side effects** of the same in the form of **stressed lives, environmental degradation, rising inequality, negative health impacts** among others.

Thus, the **need is to balance the technological developments** with human development in order to ensure an overall regime of sustainable development in India.

**Q.10) Discuss the salient features of Agnipath scheme. Underlining the benefits of the scheme, mention ways to overcome associated challenges.**

**Model Answer:**

The government recently **unveiled the Agnipath Scheme** for recruiting soldiers in the age group of **17½-21** across the three services. The salient features of the agnipath scheme can be seen as following:

1. Agnipath scheme aims to **enlist youths (17½ -21 years of age) into the armed forces**, for a **service duration of four years**.
2. After the completion of 4 years tenure, **25% agniveers will be retained** and the remaining **75% will be discharged**.
3. The Navy and Airforce will **enlist women** too as agniveers.
4. Agniveers will be insured with an **insurance cover of 48 lakhs during the term of service**. However, in case of death on duty a cumulative amount of approximately **1 crore will be paid to the next of kin** of the agniveers.
5. Though agniveers are not **eligible for pension**, the discharged cadre will receive an exit package of 11.71 lakh rupees. **Equal contribution** will be made by the agniveers (seva-nidhi) and the government towards this corpus.

The agniveer scheme is an aim towards **building a lean and battle-ready armed force**. Its benefits can be seen as:

1. The deployment of the **younger troops (17½-21/23 age)** would add value in terms of swift responses and agility.
2. Agniveer scheme is expected to **increase the fiscal space of the government for large capital investments**.
3. Agniveer scheme will ensure **constructive/profitable employment** for a large number of youth.
4. The agniveer scheme will provide **pre-trained candidates** to the Indian armed for commissioning them as officers.
5. It can **make the forces more tech-savvy** through reduced manpower-footprint.

However, the associated challenges with the agniveer scheme can be tide over through:

Challenges	Measures to overcome challenges
<ol style="list-style-type: none"> <li>1. The <b>reabsorption of exiting agniveers</b> into the workforce.</li> <li>2. The possibility of <b>lack of educational qualifications</b> in the agniveers may <b>rob the country</b> of its <b>demographic advantage</b>.</li> <li>3. The <b>exiting agniveers</b> if left unemployed/underemployed may become a <b>security challenge</b>.</li> <li>4. The <b>high exit ratio</b> may <b>dissuade the youth</b> from joining the armed forces.</li> </ol>	<ol style="list-style-type: none"> <li>1. The <b>exit ratio may be reconsidered</b>. The scheme can be made <b>more palatable</b> by retaining a higher number of agniveers.</li> <li>2. The <b>criteria for retention and for discharging</b> the agniveers should be underlined.</li> <li>3. Besides reservation, the <b>possibility of seniority for agniveers</b> in the CAPFs, police forces etc.</li> <li>4. There is need to <b>skill and re-skill</b> the agniveers. E.g., language course, computer training etc.</li> <li>5. The possibility of <b>extending certain privileges</b> in parity with the armed forces may be explored. E.g., <b>access to medical facilities</b>, canteen facilities etc.</li> </ol>

The agniveer scheme promises to turn the armed forces into a **younger, leaner and more modern fighting force**. However, for its **smooth roll out** there is a need to **allay associated apprehensions**.



**Q.11) The Fiscal Responsibility and Budget Management (FRBM) Act has become outdated; the economic dynamism of the day requires new approaches. Discuss.**

**Model Answer:**

The Fiscal Responsibility and Budget Management (FRBM) Act 2003 envisions provisions for fiscal discipline on government spending. It aims to bring **inter-generational equity in fiscal management and long-term macro-economic stability**. It prescribes limit on fiscal deficit of **3% of GDP** for centre and state governments.

The stringent provisions of FRBMA have become **outdated in face of economic dynamism** as:

1. **Borrowing and spending ability:** Stringent **caps on borrowing** limits the abilities of the governments to spend on **public welfare** as well as to invest in the economy for a **faster post pandemic recovery**.
2. **Fiscal space for structural reforms:** Stringent FRBMA targets, need be bended to bring in **structural reforms**, with **financial implications**. E.g., reductions in corporate tax.
3. **Interconnected economy:** Global shocks, like 2008 slowdown etc., have protracted effects on our development goals. This calls for a **flexibility in fiscal targets**.
4. **Frequently missed Targets:** Economic uncertainties results in missing of FRBMA targets. **Escape clause** can be activated in situations like calamity, war, national security etc.
5. **Random deficit targets:** Setting of a random, fixed, target for fiscal deficit is **unscientific** and fails to take into account dynamism of the **economic situations**.
6. **Extensions:** Act has been **revised multiple times** to adjust according to the situation. E.g., recently, targets have been revised to achieve fiscal deficit of **3.1% by 2023**.
7. **Off budget borrowings:** Since these are not accounted within the FD, it disrupts the entire purpose of the Act.

Although FRBMA has become outdated, it is an imperative for the government to **rethink the approach to fiscal discipline**. In this light besides finetuning the FRBMA, **following steps could be taken:**

1. Provide **Autonomy** to the state governments, with a proven record of fiscal prudence.
2. Establishment of a **fiscal council**, as per the recommendations of **N K Singh committee** and various **finance commissions**.
3. **Optimize off-budget borrowings** to a minimum, as these routes of funds are outside the control of parliament.
4. **Prudent government spendings**, targeting **productive capital investments** and rationalizing wasteful subsidies is an ideal way forward.
5. Give **impetus to the stalled projects** to boost up **employment, revenues** as well as **consumption demand**.
6. **Devise innovative ways** for raising capital at the level of states, municipalities and panchayats. E.g., **Municipal bonds** etc.
7. **Better coordination** between agencies with financial implications like **finance commission and GST council**.

Rather than getting an entirely new system, the FRBM Act itself needs to be modified to make it dynamic. For this reason, the **N.K. Singh committee's recommendations** have to be incorporated alongside measures to improve fiscal prudence.



**Q.12) Explain various schemes of Uttar Pradesh Government for the development of agriculture and rural areas.**

**Model Answer:**

Uttar Pradesh is the most populous state in the country and **47% of the population is directly dependent** on agriculture for their livelihood. Most of the population of UP lives in the rural area. Thus, the **growth of the rural economy and agricultural sector** is an imperative for inclusive development in the state.

**Uttar Pradesh government schemes for agriculture development**

1. **Khet Talab Yojana:** This scheme aims to **conserve rainwater** by reducing its wastage and by **increasing water table of ground water** through **water conservation**.
2. **M-Kisan:** It is SMS portal for farmers enables **all Central and State government organizations** in agriculture and allied sectors to give information/services/advisories to farmers by SMS in their language, preference of agricultural practices and location.
3. **Atma Nirbhar Krishak Samanvit Vikas Yojna:** Subsidized interest rates on **farm loans, promotion of farm-based industries** as well as **development of farm infrastructure**.
4. **Budelkhand Package Yojana:** To provide **water harvesting facilities in Bundelkhand region** for greater farm productivity and irrigation. It has facilitated **irrigation and drought mitigation works in 4 districts such as- Zhansi, Mahoba, Lalitpur, Chitrakut**.
5. **The Mandi shulk (tax)** has been **reduced by one percent**, **220 new mandis** have been created and **27 have been modernized**.
6. **Irrigation:** Major irrigation and multi-purpose projects constructed in UP such as **Sarda Sahayak, Rmaganag, Gandak Project (U.P. & Bihar)**.

**Uttar Pradesh government schemes for rural development:**

1. **Bhulekh Portal:** Provides **transparency and reliability in managing land spaces** of state I.e. **Digital Land Management System** deployed using technology.
2. **Rural soft:** A **digital database** of all the government **schemes for rural sector**, at one place, **maintained by the rural department of UP**, in order to conduct effective review/appraisal of the schemes.
3. **UP Lohia Grameen Awas Yojna:** to provide **adequate housing facilities** to the rural poor in all categories, viz, **SC/ST, OBC, non-reserved**.
4. **Jal Jeevan Mission:** to ensure **availability of drinking water** in every **rural household through household tap connections** by 2024.
5. **MGNREGA:** At present, the scheme provides **employment to around 20 lakh rural poor per day in the state**. The gram rozgaar sevaks are involved in the **distribution of job cards, allotment of work and taking attendance of laborers**.

**Challenges related to development of agriculture and rural areas:**

1. **Falling Agriculture investment:** The **investment in agriculture is decreasing** due to rise in nonfarm income avenues.
2. **Lack of infrastructural development** related to **roads, power, irrigation** is also major concern for rural development.
3. **Fragmentation of land:** The average size of **operational land holding is decreasing** due to family disputes and increasing population.
4. **Poor implementation of the schemes** due to **lack of awareness, and various inclusion and exclusion errors** is a common problem.

**Reducing farmers suicides** in light of increasing farmer suicide rate needs to be addressed by doubling farmers income. **Ashok Dalwai Committee** recommended increasing **Export Competitiveness of agricultural products** for raising GSDP of Agriculture sector. Schemes such as "One state, one product", GI tags to local products will promote economic growth in Uttar Pradesh.

**Q.13) 'Financial inclusion is a key tool for economic development and poverty alleviation'. What are the causes of 'Financial exclusion' in India? Elaborate on the steps taken by the government to deepen financial inclusion in India.**

**Model Answer:**

Financial inclusion **refers to universal access to a wide range of financial products and services at a reasonable cost.** It is a major prerequisite for the inclusive development of the nation.

**It is a key tool for economic development because:**

- **It increases the financial savings of the people**, which is a catalyzer for credit growth and money multiplier effect in the economy.
- **Credit and microcredit can be availed by small businesses and start-ups** for decentralized industrial development in the country.
- It helps in **formalization of the economy** by associating people with formal banking structure
- It helps in **regional balanced development** by providing services to all area such as in **North east states.**
- Increase in financial education **reduces the chances of fraud and helps in channelizing the money in the best possible way like investment in mutual funds.**
- **It is a key tool for poverty alleviation because:**
- It focuses on **providing financial solutions to the economically underprivileged.**
- It provides **savings and loan services to the poor in an inexpensive and easy-to-use form.**
- Services such as **micro-insurance, pension**, etc. provide financial and social security to the people. For example – PM Shram Yogi Maan dhan Yojana.
- **Welfare schemes are better targeted** like DBT scheme has helped in directly depositing Rs, 6000 in farmer's accounts under PM KISAN yojana.
- It helps people to alleviate sufferings during any emergency like during COVID-19 crisis governments have helped people directly through their bank accounts.

**Causes of financial exclusion in India are:**

1. **Poor last mile connectivity** and lack of penetration of banks in remote and rural areas.
2. **Lack of awareness** about the financial products and services, as well as financial illiteracy among the lower income group.
3. **Reluctance** of financial institutions to serve small value and/or unprofitable customers.
4. Unsuitable products, complicated processes and documentation make banking inaccessible.
5. Ease of availability of informal sources of credit makes them popular despite being costlier.
6. **Self-exclusion** is also a cause as there are people with basic bank accounts but they have poor financial habits and are unwilling to use such accounts.

**Steps taken by government to deepen financial inclusion:**

1. **National Mission for Financial Inclusion (NRFI), namely, Pradhan Mantri Jan Dhan Yojana (PMJDY)** was started to provide universal banking services for every unbanked household.
2. **PMJDY is implemented through linking of Jan-Dhan account with mobile and Aadhaar** for errorless and easy to operate services [Jan Dhan-Aadhaar-Mobile (JAM trinity)].
3. Social Security Schemes pertaining to Insurance and Pension Sector were announced-
  - a) **Pradhan Mantri Suraksha Bima Yojana** to provide accidental death and disability insurance cover.
  - b) **Pradhan Mantri Jeevan Jyoti Yojana** to provide life insurance cover.
  - c) **Atal Pension Yojana** to provide minimum guaranteed pension to the workers of the unorganized sector.
4. **Pradhan Mantri Vaya Vandana Yojana** is a pension scheme to protect elderly aged 60 years and above

5. **Pradhan Mantri MUDRA Yojana** enables small borrowers to borrow loans up to Rs 10 lakhs for non-farm income generating activities without any collateral.
6. **Stand-up India scheme to promote entrepreneurship among the people belonging to SC, ST and women category.** A loan of Rs 10 lakh to 1 crore is to be given by all the bank branches to one woman and one person belonging to SC/ST category.
7. Other schemes for financial inclusion-
  - **Jeevan Suraksha Bandhan Yojana**
  - **Credit Enhancement Guarantee Scheme (CEGS) for Scheduled Castes (SCs)**
  - **Venture Capital Fund for Scheduled Castes**
  - **Varishtha Pension Bima Yojana (VPBY) etc.**

Financial inclusion has been identified as an enabler for 7 of the 17 **Sustainable Development Goals**. Inclusion of all sections of society, especially the disadvantaged and underprivileged, into the financial system is necessary for poverty alleviation, good governance and sustainable development.

**Q.14) The 'One Nation, One Ration Card' (ONORC) scheme is a huge step forward in empowering the poor and disadvantaged, yet it faces obstacles in terms of design and implementation. Discuss.**

**Model Answer:**

**One Nation One Ration card (ONORC)** is a central scheme that **allows nation-wide portability of ration cards** under National Food Security Act (NFSA) with biometric authentication.

Scheme **empowers poor and disadvantaged** in following ways:

1. **Removing inter-state barriers:** It removes inter-state barriers by **allowing all NFSA beneficiaries to claim their ration** at place wherever they are.
2. **Flexibility:** It allows individuals to **choose their FPS** according to their convenience. For migrant labourers, it allows individual's **family members back home to claim the balance food grains** on same ration card, thereby ensuring food security of the entire family.
3. It will **curtail corruption and increases** PDS system **efficiency** by reducing dependence on a single FPS. Beneficiaries can avail services from the dealer of their choice.

Though ONORC is a visionary scheme, it has following obstacles in terms of **design and implementation:**

1. State-specific issues:
  - a) Low Aadhar seeding in Assam (only 36-38% against all India average of 92%) due to concern related to National Citizens register.
  - b) The centre-state tussle has been delaying the scheme in states such as Bengal. Delhi wants to implement its own door-to-door ration delivery system.
  - c) Chhattisgarh has its own digitized system of PDS which creates issue of compatibility with ONORC system
2. **Logistical bottleneck & demand supply mismatch:** An FPS receives the **monthly quota** in accordance with the number of people assigned to it. ONORC can cause disruption by **creating shortage in some FPS and wastage** in others.
3. **Exclusion:** The scheme seeks to provide subsidized food grains, to **Aadhar linked, digitalized ration cards**. 100% of ration cards are yet to be linked to Aadhaar with many sections still lacking Aadhar cards. This would lead to **exclusion of many beneficiaries**.
4. **Reconciling migrant data:** A big challenge is **studying, recording and regularly updating** labor migration patterns, especially, when members of a **family migrate for few months**.
5. **Lack of clarity:** Clarity on **operating procedures and beneficiary entitlements** regarding prices and food habits in different states is lacking.

6. **Preparedness of states:** Many states are **in installation of electronic Point of Sale (ePoS) machines**. Only 77% of FPSs have installed ePoS. According to Food Ministry data, two key states **Bihar (ePoS installed at only 62 FPSs) and West Bengal (ePOS installed at only 366 FPSs)** that witness huge labor emigration are laggards in this regard.
7. It will be **difficult to migrate other domicile-based social sector schemes** like anti-poverty schemes, rural employment, mid-day meals, etc. which are provided along with PDS.

Following are **suggestions** to ensure effectiveness of ONORC:

1. The **Rastriya Swasthya Bima Yojna (RSBY)** had component of splitting the unique insurance card to help both migrants and their family members. Similar can be adopted for ONORC.
2. **National database for unorganized workers** announced in 2020 must be implemented as early as possible.
3. A dedicated **e-commerce platform for ONORC** can be established to resolve logistics challenges.

ONORC is a step towards achieving **SDG 2 i.e., zero hunger**. As observed by **Supreme Court**, all states must implement ONORC scheme. States must be pushed for **technological readiness for ePOS at FPS**. In longer run, PDS system can be replaced by **food coupons or DBT for poor**, so that they can buy food grain from any store.

**Q.15) Analyze the various problems in agricultural marketing system in the country. How far do you think that the reforms brought by new farm laws in agricultural marketing will solve these issues?**

**Model Answer:**

India has transformed itself from an import-dependent to self-sufficient agricultural nation since the green revolution. Though **production has increased** considerably **but farmers' incomes have not increased**. Various bottlenecks in agriculture especially in marketing system have prevented realization of good remunerative prices by the farmers. Following **problems in agricultural marketing system** led prevalence of poor conditions of the farmers:

1. **APMC restrictions: Barriers exist in free flow of agriculture produce** between various States due to various state APMC legislations and farmers are **not allowed to sell farm-produce outside the notified APMC markets**. APMCs with limited number of traders has led to **cartelization among traders and intermediaries** preventing farmers to realize good price.
2. **Lack of sufficient storage:** Indian farmers lack proper storage or warehousing facilities. Lack of investment in necessary infrastructure such as warehouse, cold storage etc. exists due to **stock limit imposition**. Absence of storage **forces the farmers to sell their produce at the earliest at low prices**.
3. **Lack of Transport Facilities:** Due to absence of road transportation facilities in the rural areas, Indian farmers are **unable to reach nearby mandis to sell their produce at a fair price**. As a result, they **sell their produce at low prices in the village markets itself**.
4. **Intermediaries:** There is chain of intermediaries that exist between the cultivator and the consumer such as **wholesalers, brokers, commission agents, etc.** All these middlemen claim a good amount of margin and **reduce the returns of the cultivators**.
5. **Corrupt mandis:** There are various corrupt practices ongoing in mandis such as use of defective weights and scales. **Lack of knowledge of market prices, government policies etc.,** among farmers lead to their exploitation.



Government has enacted **new farm laws which will resolve various issues** in following ways:

1. **The Farmers Produce Trade and Commerce (Promotion and Facilitation) Act, 2020 (FPTC):** FPTC will result in compressing the value chains and eliminating excessive intermediation as it promotes **competitive alternative trading channels**. It promotes barrier-free **inter-State and intra-State trade, and commerce of farmers' produce** by allowing trade outside deemed APMC markets. It also **promotes e-commerce in agriculture** and allows the setting up of an electronic platform for the sale and/or purchase of farm produce.
2. **The Farmers (Empowerment and Protection) Agreement of Price Assurance and Farm Services Act, 2020 (FAPAFS):** FAPAFS removes **complicated system of registration/license, deposits, and various other compliances** in contract farming provisions in various states. It promotes **engagement of farmers in direct marketing**, thereby eliminating intermediaries, reducing marketing costs and better price realization. It allows farmers to **engage with processors, wholesalers, aggregators, exporters, etc.**, on a level playing field.
3. **Essential Commodities (Amendment) Act, 2020 (ECA):** ECA **removes stocking limits** on traders for many commodities such as cereals, pulses, onions, potatoes, edible oil, and oilseeds. It will **allay the fears** of private investors over **excessive regulatory interferences**.

Though there are multiple benefits of these reforms, there are potential concerns such as farmers being at **mercy of larger private players once these APMCs are liberalized (post Bihar APMC repeal), end of MSP-based procurement system, etc.** Addressing various concerns related to these acts is crucial for all the stakeholders. Not only easing the laws, but **other agricultural reforms are also needed** to empower farmers and double their income.

**Q.16) How is 5G different from previous generations of tele-communication technology? Underlining the transformative application of 5G technology, discuss various challenges in its roll-out.**

**Model Answer:**

5G is referred to the **next generation wireless cellular technology** that is envisaged to provide faster communication with ultra-low latency. 5G is **different from the previous generations** of tele-communication technology as:

1. In contrast to the 1G (**analog technology**), which faced the issues **like call drops, poor voice quality** etc., 5G cellular technology provides **reliable communication network**.
2. In comparison to 2G technology, which provides longer range, 5G technology enables **higher data transmission speed** albeit with **less coverage/tower(range)**.
3. In comparison to the 4G technology, 5G has **higher speed** (up to 20 Gbps), **frequency** (26 GHz) **and low latency** (less than 5 milliseconds).
4. 5G technology has relatively **greater number of non-overlapping channels**, which will **prevent distortion in radio signals**.

5G technology is expected to have **transformational applications** across various sectors, such as:

1. **Infrastructure:**
  - a) 5G technology will enable the **actualization of smart grids**. E.g., integration of solar power, wind power with central grids.
  - b) 5G networks can aid in **creation of intelligent transportation system**. E.g., use of 5G enabled AI in traffic management.
  - c) 5G can lead to **building of information highways**. E.g., connecting villages with **faster internet facilities**.
2. **Emerging technologies:** 5G technology is expected to form the backbone for emerging technologies like AI, Drones, Machine to Machine communication, Metaverse, blockchain etc.



3. **Industrial application:**
  - a) 5G will **facilitate automation in the industrial manufacturing**, conserving time, money and energy. E.g., **use of robots in production lines**.
  - b) 5G can enhance the use of **augmented reality platforms** for **simulation, human resource management, troubleshooting** etc., in industries.
  - c) 5G can enable **real-time flow of big data** leading to **efficient supply chain management**.
4. **Efficient governance:**
  - a) 5G technology can enable **better delivery/access of welfare measures** of the government. E.g., effective roll out of NDHM; extension of **tele-education** to the last mile etc.
  - b) 5G technology can bolster the initiative for **connectivity** and **participative governance**. E.g., **5T initiative of the Odisha government**.
  - c) E-governance can weed out the elements of **corruption, exclusions, discretion** etc., from governance. E.g., real time monitoring of schemes; better grievance redressal etc.
5. **Agriculture:** 5G aided technologies can **bolster resource efficiency in agriculture**. E.g., gauging nutritional requirements for soil, availability of water etc.
6. **Ease of living:** High speed of 5G will **augment the technologies** that can **enhance the ease of living** for the people. E.g., **virtual assistants**, possibility of **autonomous vehicles** etc.

However, the effective roll-out of the 5G technology **may face challenges like:**

1. Lack of adequate infrastructure. E.g., **low fiberization** (approximately 30% of India's telecom towers are connected with fibers).
2. Fears of **spectrum interface with the crucial aircraft navigation** led to **cancellation of several flights in the USA**, post the roll-out of 5G. Similar glitches may dampen the roll-out of 5G technology in India.
3. **Legacy issues** with the payment of dues (AGR) has created a credit crunch for the telecom sector.
4. The absence of adequate **technological know-how** may lead to **dependency on foreign players**,

**Smooth roll-out of 5G** can be ensured by:

1. **Conducive, predictable policy environment** for seamless auction of 5G spectrum.
2. Facilitating a **robust credit-supply** for the tele-communication sector.
3. Encouraging **healthy competition** in the 5G sector, preventing monopoly.
4. Developing **indigenous technology**, to **ward-off security risks**.

In order to **leverage transformative applications** of 5G technology, it is an imperative to resolve the associated challenges. **National Digital Communication Technology, 2018** is a prudent step in this direction.

**Q.17) "Security forces can't solve the Naxal problem alone, impact comes when all the dimensions are incorporated". Elaborate. Also, suggest measures to stop the youth from joining the Naxal forces.**

**Model Answer:**

Former prime minister Manmohan Singh called Naxalism the biggest threat to internal security. The two-pronged approach to dealing with Naxalism –development and security –has, over the years, become a kind of chicken and egg situation.

The impact comes when security, development, governance, all are incorporated. There is a need for an ability to

- linguistically connect with Naxalites and the vulnerable population,
- culturally respect them,
- and make them part of developmental process

Counter-insurgency is a very complex affair. Security is just one dimension. The job of security forces is to keep the area safe from physical violence. Their job is to clean up the armed Naxalites. The other dimensions need to be addressed simultaneously as counter insurgency is a sure shot failure without a multi-pronged strategy.

Development itself has many dimensions. By focussing only on infrastructural dimension of development the situation is unlikely to get better soon.

Infact infrastructure is the easiest and the most target of the armed Naxalites. Focus should also be on cultural development, educational development, employment opportunities, technological development, agricultural development, sports development etc.

### **Suggested measure to stop youth from joining Naxalism:**

The phase of life in which the youth gets influenced by the Naxalites and joins them is marked with vulnerability, insecurity and social exclusion. Therefore, the need of the hour is to provide the children and youth of the naxal affected areas with alternatives which engage their attention and induce curiosity and learning and help them develop into confident adults capable of making informed decisions.

### **For this, suggested measures are:**

**Sports:** engaging youth in sports helps them to intermingle with others affected by the same insecurities. It diverts their energies and enthuses them with a positive team and sportsman spirit. This strategy was deployed in Sierra Leone by the UN and was successful.

**Technological exposure and access:** the youth should be exposed to technology of day to day use and be taught to use them constructively. The use of Bluetooth technology to transfer data has seen good results in the villages of Madhya Pradesh. These technologies can be used to engage the youth in learning academics and finding solutions to local problems. The day to day problems of the naxal affected regions should be solved to technology and this technology must be promoted amongst the youth.

**Cultural development and exposure:** the local culture-music, dance, songs, food, festivals should be developed and given a national platform. Their cultural should not only be respected but celebrated. Simultaneously they should be exposed to the culture of rest of the country to incite curiosity. This will help them in integrate with the larger society and become a part of national development as well as make them realise that national development has no meaning without their own access to development.

As mentioned earlier focus should also be on agricultural development, educational development and development of appropriate educational avenues.

The government unveiled the National Youth Policy in 2014. This is a step in right direction. Stress should lay on its proper implementation.

### **Q.18) How has India's Nuclear Programme contributed to the economic and defence requirements of the country?**

#### **Model Answer:**

**India's three-stage nuclear power programme** was formulated by **Homi Bhabha** in the 1950s to secure the country's long-term energy independence, through the **use of uranium and thorium reserves** found in the **monazite sands of coastal regions of South India.**

## Contribution to economic sector:

### 1. Energy security:

- a) **Nuclear power is the fifth-largest source of electricity** in India after coal, gas, hydroelectricity and wind power - total of 35 TWh and **supplied 3.22% of Indian electricity in 2017.**
- b) **The third stage of the program can help in achieving energy security, given our dependence on oil and coal imports**

### 2. Food and agriculture:

- a) **Radioisotopes and radiation technologies** prove as useful tools in biological research for **improving crop productivity** and to **reduce post-harvest losses**
- b) **New crop varieties in oil seeds and pulses.** Using **radiation-induced mutagenesis and hybridization**, 39 crop varieties have been developed
- c) **Climate resilient and adaptive agriculture:**
  - i. **Transgenic plants for improving biotic resistance and enhanced remediation of heavy metals**
  - ii. **Biological systems for remediation of organic and inorganic pollutants and development of biosensors**
- d) **Food processing:**
  - i. **Radiation processing of agricultural commodities** and application for **extension of shelf life**
  - ii. **Preservation, disinfestation or hygienization** and also for **quarantine treatment of exportable agricultural commodities**

### 3. Healthcare:

- a) **PET and Nuclear Medicine**
- b) Diagnostic investigations related to cancers of various organs
- c) A PCR-based diagnostic kit has been developed for tuberculosis.

### 4. Indigenous electronics and engineering systems:

- a) **The core competencies cover a wide spectrum** and include process sensors, radiation detectors, nuclear instruments, microelectronics, etc
- b) Leadership in **high-performance computing and cyber security solutions**
- c) **The technology spin-offs** include products for **industrial, medical, transportation, security, aero-space and military** applications

### 5. Water resource development and management:

- a) **Uranium pollution:** BARC developed **UF-RO technology** giving clean water
- b) Several types of **thermal and membrane-based desalination and water purification technologies**
- c) **Assessment of groundwater recharge and aquifer mapping** using isotope hydrology techniques
- d) **Rejuvenation of drying springs and identification of groundwater sanctuaries** using isotope hydrological investigation

### 6. Rural development:

- a) **Spin off technologies, NISARGRUNA and AKRUTI** programs initiated for rural development

## Contribution to defence sector:

### 1. Smiling Buddha, 1974:

- a) India's **first successful nuclear bomb test** - also the first confirmed nuclear weapons test by a nation **outside the P5**
- b) **BARC was authorized to manufacture a nuclear device** and prepare it for a test.
- c) The test used **plutonium produced in the Canadian-supplied CIRUS reactor**

## 2. Pokhran II:

- India performed further nuclear tests in 1998 (code-named "**Operation Shakti**") and declared that India is capable of **producing a neutron bomb**.
- Series of five nuclear bomb test explosions - achieved the main objective of giving India the **capability to build fission and thermonuclear weapons** with yields up to 200 Kilotons.
- The **scientists and engineers of BARC, AMDER and DRDO** were involved in the nuclear weapon assembly, layout, detonation and data collection.

## 3. Nuclear triad:

- It is a **three-pronged military force structure** that consists of land-launched nuclear missiles, nuclear-missile-armed submarines, and strategic aircraft with nuclear bombs and missiles
- India has developed a **nuclear triad capability** as a part of its "**Minimum Credible Deterrence**" doctrine
- India's land-based arsenal includes the Prithvi and Agni missiles, four types of bombers that are capable of carrying nuclear bombs and completed its nuclear triad with the commissioning of INS Arihant in August 2016.

However, in India, nuclear capacity addition is found to be surprisingly slow owing to safety and capital concerns. The spinoff nuclear technologies hold immense promise for socio-economic development of the nation and private investment must be promoted to commercialise these technologies.

**Q.19) Cyberthreats can wage a dual war on the state and citizens, disrupting the national security as well as social stability. Explain.**

### Model Answer:

**Cyberthreat** is the possibility of a malicious attempt to damage or disrupt computer systems, network and associated applications. Some of the prominent **types of cyberthreats** are **Phishing, Denial-of-Service Attack, Malware etc.** India suffers an average of nearly **2,00,000 threats every day** as per US-based cyber security firm, Norton. With increasing push for digitization across government and society, cyberthreats **endanger security of state as well as citizens.**

Cyberthreats can have **disruptive impact on national security** in following ways:

- Supply lines of defence** can be disrupted such as through hacking of railways' network.
- Espionage:** Military advantage can be gained through information on **military tactics**, plans, secret communication, etc. via **compromised communication devices.**
- Financial Security:** Cyber-attacks to disrupt energy supplies, such as **ransomware attack on Oil India Limited** in April 2022, can have economy-wide impact. Attacks on financial systems like **stock exchange or banks** can bring the national economy to a halt.
- Strategic Assets:** Hacking of nuclear facilities, missile systems and space assets like satellites are grave threats. E.g., USA's use of **Stuxnet malware** to disrupt the **nuclear programme of Iran.**
- Cyberthreats pose **challenge to sovereignty.** E.g., non-state actors can use it to coerce government into releasing terrorists or giving in on contentious issues.

Cyberthreats **disrupt social stability** in following ways:

- Disinformation** is used to spread **radicalisation.** It can be a vehicle to orchestrate protests or to cause tensions in society, including through **calls for violence**, fake news etc. E.g., **the toolkit controversy** on farmers' protests in Delhi or the **Udaipur killing for blasphemy.**



2. Threats to power systems and fuel shortages can **disrupt life and livelihood**. It can give push to inflation and cause **social and political unrest**, similar to the **oil crisis of the 1970s**.
3. **Criminalisation of society**: Cyberspace is becoming the domain of small-town fraudsters. E.g., places like **Jamtara** have become notorious for **vishing**.
4. Vulnerable sections like women and children become victims of **human trafficking, drug smuggling, child pornography** etc. which are operated on **the dark web**.
5. State itself can become an **authoritarian threat for citizens** through total control on cyberspace in form of a '**big brother state**'. E.g., in China.

**Following steps** can be taken to address the cyberthreats' challenge to national security and social stability:

1. **National Cyber Security Strategy** should be formulated to strengthen cyber security architecture as well as response. There is need for capacity building towards **offensive capabilities** in cyber warfare.
2. **Cyber literacy** should be promoted including **digital etiquettes** and **awareness** about financial frauds.
3. Effective communication from **government sources** combined with **media plurality** can help check the effect of propaganda, deception, disinformation, and adversarial narratives on social media
4. Technological solution such as **blockchain** can help build more robust architecture for financial systems that would be **tamper-proof from cyber-threats**.
5. **Social media** platforms should be proactive in countering disinformation by sufficiently cautioning people about **controversial information** and banishing **fake news**.

Cyberthreats is a serious emerging challenge to nation across domains of defence, economy, law & order and social wellbeing. The digitization of our world needs to be coupled with **measures for personal and national security**.

**Q.20) Internal security in India is vulnerable to threats, tensions and conflicts originating both from indigenous and exogenous sources. Discuss.**

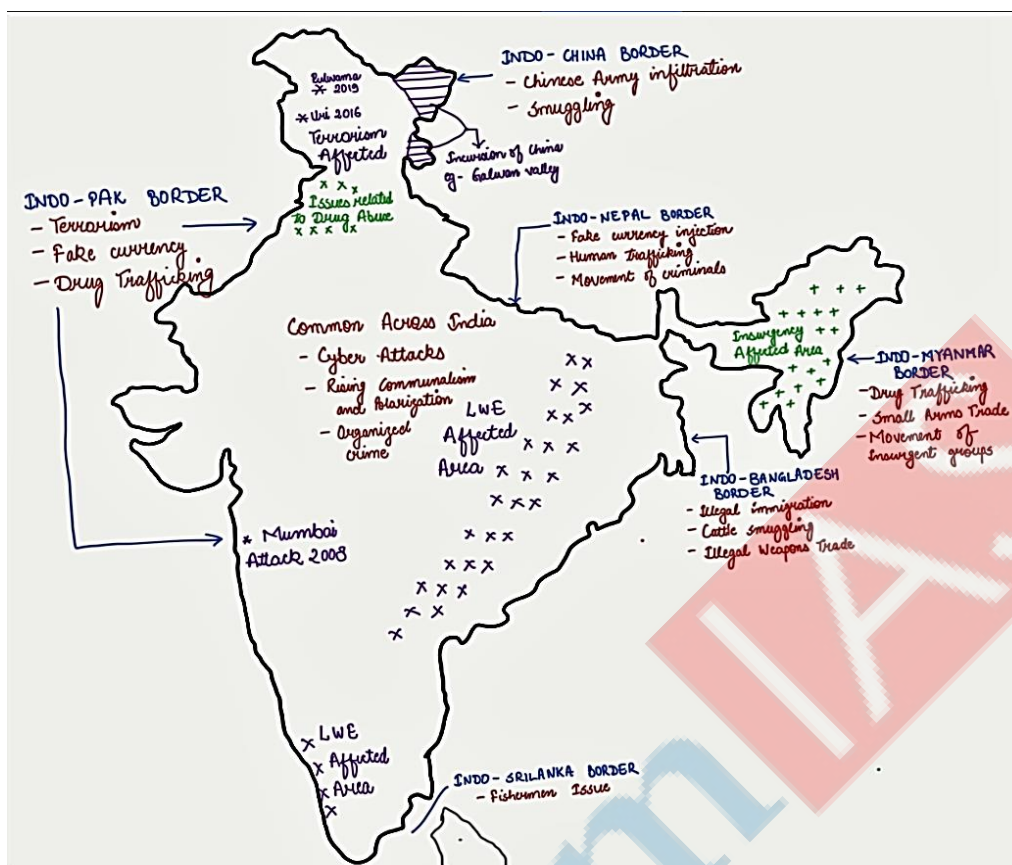
**Model Answer:**

Internal security is **an act of keeping peace within the borders** of a sovereign state by defending against internal and external security threats. In India, it is the **responsibility of the Home Ministry** to ensure internal security.

**Internal sources** (indigenous) include organized crimes groups, left-wing extremists, secessionist groups, and conflict between different communities. Whereas, **external sources (exogeneous)** include **non-state actors** outside the country like terrorist groups and **state actors** like state sponsored entities especially in the case of China and Pakistan.

The **different regions of India face different types of internal security challenges** due to exogeneous and indigenous reasons as discussed below:





1. **Northern regions** including Jammu and Kashmir and Punjab region:
  - a) **Secessionist movement**, for instance, the erstwhile Khalistan movement in Punjab.
  - b) **Pakistan sponsored terrorism/ militancy** poses challenge in Jammu and Kashmir. **For instance, recently a drone led terrorist attack** was attempted in the Jammu region. Militancy especially in Kashmir region.
  - c) **Border conflict with China and Pakistan** affects peace and security in the region.
2. **North eastern region:**
  - a) **Insurgency** in north eastern states like in Nagaland violent activities of the factions of NSCN (K, I-M) are a constant threat.
  - b) **Conflict among various tribal communities** in North Eastern states. **Border conflict between Assam and Mizoram** in July 2020 is an example of the threat.
  - c) **Illegal migration from Bangladesh and Myanmar (Rohingyas)** creates conflict between indigenous and illegal migrants. It also may lead to infiltration of **radicalized** individuals.
3. **Eastern region**
  - a) **Left wing extremism (LWE)** in states like Jharkhand, Chhattisgarh, Odisha and West Bengal is one of the biggest threats to India's internal security.
  - b) **Organized crimes such as human trafficking**, drug trafficking from Golden Corridor in the border areas also creates security challenges.
4. **Coastal region**
  - a) Threat from **organized crime occurring through sea** such as piracy, drug trafficking and arms smuggling.
  - b) **Coastal Border security** challenges due to a wide coastal line.

India is also facing some **common and emerging internal security threats** such as **cyber-attacks and cyber espionage** by state and nonstate actors; **communal tension and caste conflict**; **extreme case of regionalism** as witnessed in **son of the soil movement** etc.

The following are the **various negative implications** of internal security challenges on the country:

1. Create **law and order problems** and therefore threats to life and national property.
2. **Disturbs the conducive environment** required for foreign investment and investment led development.
3. **Disturbs communal harmony** and therefore negatively impacts **unity and brotherhood** in the country.
4. Internal security threats like secessionist movement and insurgency challenges **sovereignty and territorial integrity** of India.

However, the government has taken **developmental and security related steps** to manage internal security challenges such as **Comprehensive Border Management, three layers of coastal border security** with help of the marine police, the Coast Guard and the Navy, **Ceasefire agreement** with various north eastern insurgent groups like **NSCN(IM), NSCN(KK), SAMADHAN initiative** to holistically deal with the threat of Left-wing extremism. Further, **IT act 2000, NATGRID and CERT-IN** etc. to deal with cyber security threats. Measures like **Ek Bharat Shresht Bharat**, regular meetings through **zonal Council**, and **developmental schemes like Nai Disha and Nai Manzil** to build social capital and social harmony.

Internal security threats negatively affect **economic, social and political pillars** of a country. Therefore, there is an urgent requirement to act on priority basis to ensure **security, peace and social cohesion**.