

Q.1.

India is the second largest producer of dairy products and women constitute 90% of the industry according to World Bank.

Women's contribution to livestock rearing -

1. Women make up 90% of the workers and constitute the unorganised labour force for livestock rearing.
2. Agrarian crisis has led to mass migration of ~~women~~ to urban areas, leaving woman to manage agriculture and allied activities.
3. Women are responsible for 80% of the milk production in India through cooperatives like Amul.

Issues by women in livestock -

1. Lack of access to formal credit due to unorganised nature and lack of property ownership, women do not have access to loans from banks.
2. Lack of health and care facilities for livestock and incidence of diseases like Foot & Mouth disease
3. Fragmented and unorganised retail - 90% of livestock retail sector is unorganised leading to poor remuneration.
4. Regional imbalances in cooperative presence.

Women can be organised and their resources pooled in like done by Saguna Chicken & Poultry and aim to increase economies of scale and their bargaining power.

Q. 2.

One Nation One Ration Card scheme has been introduced to allow portability of ration cards and allow access to PDS facilities to migrant beneficiaries.

Potential benefits of migrants -

1. Migrant labourers were excluded from access to PDS facilities due to interoperability of ration cards.
2. Under ONORC, migrant labourers can claim their rights under [NFSA] in states they are working in.
3. Improve health and productivity
According to World Bank, India loses 3% of GDP due to poor nutritional status of workers.

→ Potential benefits for urban poor and daily wagers -

1. Unlike rural beneficiaries, who stay and work in fixed areas, urban poor & daily wagers move frequently due to their nature of work.
2. ONORC will allow urban poor and daily wagers to access PDS in any part of India regardless of their address.
3. Improve nutritional status, health outcomes and reduce incidence of high expenditure on healthcare.
4. Tackle urban inflation: prices in urban areas for food & fuel and living cost is much higher.

Therefore, ONORC will make rights-based approach under NFSA more effective.

Q. 3

According to IPCC 6th Report, India is amongst the most vulnerable nations to adverse effects of climate change.

Effect on agricultural production and productivity in India -

1. Degradation of land: productivity of land has reduced due to salination from frequent rainfalls caused by change in weather event.
2. Soil erosion and contamination caused by leaching of pollutants.
3. Scarcity of water: according to Composite Water Index by MITI Nagoya, 50% of water needs will be in met by 2030.

4. loss of biodiversity and organic matter - eg: worms and natural mulchers decreasing due to use of excessive chemicals.

Climate smart water saving agri-tech need:

1. Agriculture uses 80% of water in India and 60% of agriculture needs are met by groundwater.
2. Water saving agrotech like micro irrigation and drip irrigation will ensure increase in water use efficiency by 80% according to Sahwai Panel
3. Water saving agrotech like vertical farming will allow precision of delivery.
Therefore, more investment in capital assets is required.

Q. 4.

IFFCO has recently introduced nanofertilizers like Nano Urea and Nano DAP, making India the first country to do so.

Economic benefits -

1. Reduction in cost of warehousing by 80% as 5kg of nanofertilizer is equivalent to 50kgs of conventional fertilizers in efficiency.
2. Reduction in input cost for farmers leading to increase in agri income.
3. Reduction in fiscal burden of govt. for fertilizer subsidy.

Environmental benefits -

1. Protect soil degradation from excessive leaching of chemicals.
2. Prevent eutrophication of lakes from run off pollutants from farms.
3. Increase nutritional value of crops.

Concerns in adoption -

1. High initial cost of procurement for farmers.
2. Lack of infrastructure, like spraying equipment.
3. Lack of awareness about benefits and extension services.

Therefore, government will have to conduct pilot projects to ascertain success of narrow area and make it available & accessible to farmers.

Q. 5.

natural gas is used as less
polluting alternative to coal
and petroleum products for
energy generation and
transportation.

Availability and distribution
for economic and social progress -

1. Access to public mobility -
public transport on natural
gas like CNG buses are more
economical & less expensive.
2. Access to LPG pipelines under
PM Ujjwala will lead to
women empowerment and
health benefits.
3. Access to cheaper power
supply.

Challenges -

1. Lack of availability of natural gas resources -
natural gas is produced in some areas of Bombay High, Degbori Assam but 90% of needs are import dependent.
2. Increase in current account deficit due to high imports.
3. Environmental pollution caused by natural gas.
4. Lack of penetration of transport run on natural gas.
Eg: only some urban centres like Delhi have adopted mandatory guidelines.

Therefore, there is a need of dedicated national policy and also exploring other renewable alternatives.

Q. 6>

Human-wildlife conflict in India leads to several deaths of both humans & animals annually.

Reasons -

1. Poor demarcation of ~~wild~~ wildlife areas and lack of proper fencing and boundaries around wildlife sanctuaries & national reserves.
2. Cohabitation of animals and villages which fall within and around wildlife reserves.
3. Illegal poaching and hunting activities.

4. loss of habitat of animals causing them to venture close to human settlements
5. lack of water and natural prey causing animals to attack humans.

Measures taken -

1. Elephant corridors & human-elephant conflicts have led to increase in elephant deaths in southern states. Centre has demarcated elephant corridors and 11 ranges.
2. Stringent implementation of Wildlife Protection Act, 1976
3. More powers to Chief Wildlife Wardens.

Proactive role of states and centres is required.

Q. 7.

According to census projections, urban population is going to increase to 50% from current 30% by 2030. Rapid unplanned urbanisation has caused several issues.

Linkage b/w urbanisation & noise pollution:

1. Construction activities caused severe noise pollution due to use of heavy machinery.
2. Transportation and heavy density of traffic in urban centres lead to most noise pollution.
3. Industrial centres cause noise pollution.

as they are clustered
around urban markets.

Effects of noise pollution on
human health -

1. According to WHO,
prolonged exposure to
more than 65 decibels
causes hearing loss.
2. Noise pollution leads to
diseases like migraines
and frequent headaches.
3. Noise pollution can cause
permanent damage to
eardrums and reduce
cognition disabilities.

Therefore, stringent adherence
to Noise Pollution Rules
under Air Pollution Act is
required.

Q. 8.

Indian Space Policy, 2023 is set to usher a paradigm shift in space sector in India to encourage private sector participation. It is termed as the "1991 Economic Reforms" movement of space sector.

Catalyst for development

1. With new, autonomous bodies like InSpace and NSIL, Space Policy intends to liberalize space sector.
2. NSIL will function as commercial arm of ISRO - dealing with industrial links and handholding.

and tech-transfer to new startups.

3. Inspace will be responsible for making ISRO's assets like launchpads and rockets accessible to both Indian companies and international market.

4. Indian space sector has huge potential for growth leading to creation of jobs and economic growth.

5. ISRO's achievements can be shared with private sector to increase production and indigenous manufacturing.

Recently, Vikram Rocket, India's first privately manufactured by Spacroot, Hyderabad.

Q. 2

Special Frontier Force (SFF)
functions under Ministry of
Home Affairs, recruiting
Tibetan members to protect
Indian borders with China.

Mandate of SFF :

1. Posted along China (Tibetan)
border along states of
^{sikkim}
~~Uttarakhand~~, UP and Bihar.
2. Special Border Protection
force to ensure buffer
b/w China and India
and prevent illegal activities
like smuggling and
trafficking.

Achievements of SFF

1. Productive employment of channelizing of Tibetan youth against Chinese aggression.
2. Important intelligence and reconnaissance source for activities on ~~other~~ Chinese side.
3. Buffer force and complementary Indian defence personnel.

Therefore, SFF has played a crucial role in current standoffs Eg at Doklam to provide support and intelligence.

Q. 10.

Maritime security falls under the mandate of Navy and National Coast Guards under Ministry of Defence in India.

Significance of maritime security

1. Strategic well-being:

maritime security is crucial to fend off increasing Chinese aggression through String of Pearls strategy, with ports at Guadalor and Hambantotta.

2. Maritime security is crucial to prevent illegal smuggling and trafficking

3. Crucial for prevention of infiltration and terrorist activities eg: terrorist entered through sea route during 26/11 Mumbai Attacks.

4. Economic well-being : large scale counterfeit & pirated products enter India from Bangladesh & Myanmar through marshes of Sunderbans, Bay of Bengal

Maritime Anti-Piracy Act ; will ensure provisions for detection and prosecution of offenders. Prevent & tackle piracy in Indian Ocean Region.

India is also coordinating with Quad and ASEAN to tackle piracy in IOR.

Q. 11.

7 priority areas (Saptarishis) have been listed in Budget 2023-2024 to transform Economy, continue post covid recovery, and meet target of \$5 trillion Economy by 2030.

Saptarishis:

1. Infrastructure: through National Monetization Pipeline and National Superstructure Pipeline to raise finances and build capital assets.
2. Green growth to meet NDCs and Panchamrit targets of 50% energy demand met by

renewable energy by 2030 ;
changes made to Building
Codes for new commercial
buildings.

3. Financial sector: global
services provided through
GIFT City, Gujarat and
financial inclusion through
PM Jan Dhan etc.

4. Youth power: tapping into
60% of population in working
age by 2030 to reap
demographic dividend.

5. Inclusive development to
allow distribution of
wealth equitably.

6. Reaching last mile and
providing all basic facilities
like water through Jal

Tejvan mission and electricity
through ambagya scheme

7. Unleashing potential of
manufacturing and MSMEs

Promote inclusive development

1. creation of public goods & infrastructure to cause multiplier effect on economic growth.
 2. Job creation and employment opportunities for large population.
 3. Tap the potential of manufacturing sector & reduce import dependence.
 4. Distribution of wealth & access to basic minimum.
- therefore, 7 priority sectors can streamline development and outcomes.

Q. 12.

Blockchain technology utilizes decentralized ledgers and transparent and participatory storage of data to prevent frauds & threats to data security.

Pivotal role towards digitization of land records:

1. Storage of large amounts of data spread across various servers.
2. Data security as blockchain technology is tamper-proof and secure.

3. Decentralized access to all stakeholders like centre, state govt and citizens.
4. Privacy and protection of sensitive information as access available only through authorization.
5. Transparency and accountable storage of data as blockchain allows access to all and allows public scrutiny of data collected.
6. Reduction of fiscal burden to avail cloud services for storage of data which requires heavy expenditure.

7. Tackle issues of data localization. ↓

8. Govt is undertaking digitization through several schemes like National Land Records Digitization Mission and Suamitva Scheme for urban areas - blockchain will allow coordination and collection uniformly.

9. Allow inter-ministerial cooperation and prevent duplication of efforts.

10. create a single database of all land records in the country.

Therefore, steps are being taken through Open API resources to create indigenous blockchain.

Q. 12 >

PPP models allow pooling of financial burdens, risks and resources of both government and private sector to increase efficiency of service delivery.

PPP help in improving storage -

1. Currently India suffers from severe lack of infra for warehouses and storages - only 7000 cold storages exist according to Economic survey.
2. PPP model can ensure creation of assets in rural areas and provide access to crucial infra to

reduce post-harvest losses which are as high as 45-50% according to Dahsai Panel.

3. PPP projects can be used to create common warehouses and increase stockholding which suffers due to Essential Commodities Act, 1952 — which has prevented private participation.

PPP model for transportation -

1. Currently the number of refrigerated vans and transport facilities are highly inadequate and also fragmented and unorganised.
2. This leads to increase in number of middle men and

intermediaries which leads to poor prices for farmers and high prices for consumers.

3. PPP model for transportation will help organize the sector and streamline the value chain, thereby providing greater reach to farmers.

PPP for marketing:

1. PPP projects for training of farmers and FPOs to provide skills like private labelling, increased access to markets for better prices.
2. Extension services for awareness about market demands & improvement in quality to increase exports.

Therefore, PPP model can involve private sector leading to doubling of farmers' income.

Q. 14.

SMART - PDS has been conceptualized based on recommendations of Shanta Kumar Committee to provide structural transformation at each stage of procurement, storage, transportation and distribution by FCI and state governments.

Benefits for food security -

1. NFSA mandates rights-based approach to tackle hunger and provide subsidized foodgrains to beneficiaries.
2. SMART-PDS will prevent leakages which are as high as 45-60% according to Shanta Kumar Committee.

Transformative potential

1. SMART - PDS will allow adoption of technology at various stages allowing transparency, accountability and efficiency of service delivery.
2. Procurement through FCI and payment of MSP through DBT and biometric adhaar to prevent frauds & payments to ghost beneficiaries.
3. Storage: GIS tagging and mapping of facilities ;
- adoption of refrigerated vans & mechanized storage facilities to fight the current unsustainable plinth storage which leads to

spoiling of foodgrains due to humidity and rains.

4. computerization of data of beneficiaries : end-to-end computerization of all PDS shops.
5. PDS systems at PDS shops to ensure access to beneficiaries and prevent inclusionary errors.
6. Storage of data on blockchain to provide decentralized access to all stakeholders.

SMART-PDS will allow India to meet mandates under NFSA and improve position in Global Hunger Index which stands at 112 in 2022.

Q. 15.

Marine heatwaves are localized heating beyond average temperatures more than 4°C and cause severe risk to marine biodiversity.

causes behind occurrences -

1. Heating of global temperature and increase of 1.1°C above pre-industrial levels.
2. Change in climate and weather events due to global warming.
3. Increased heat trapped in oceans leading to indiscriminate heating of surface layer.

4. increased storage of CO_2 in oceans causing more heat to be trapped.
5. changes in ocean currents and increased radiation due to damage of ozone layer.

Effect on marine Ecosystem

1. marine heatwaves severely affect the entire ecosystem as they leads to depletion of plankton which serve as primary energy for the ecosystem.
2. large scale damage to corals which cannot survive beyond $27^{\circ}C$ leading to disruption of 60% life forms dependent on corals in marine ecosystems.

~~Economic loss~~ 3. Disruption
of global wind circulation
and primary winds which
depend on pressure zones
created over oceans.

4. Damage to global thermo-
haline circulations of
ocean currents.

→ Economic loss -

1. Damage to navigation
facilities due to disturbed
winds and ocean currents.
2. Depletion of marine resources
like seaweed and marine
food products.
3. Fisheries hampered immensely
due to depletion of fishes
due to loss of habitat.

Therefore, marine heatwaves
damage the entire ecosystem
and are increasing in frequency.

Q. 16.

Glacial Lake Outburst Floods (GLOFs) are caused due to glacial outflows and flow of freshwater from glaciers causing widespread damage to life and property.
GLOF was responsible for 2011 Kedarnath disaster.

causes of GLOFs -

1. Melting of glaciers due to global warming.
2. Depletion of ice sheets due to increase in average temperature and loss of albedo.
3. Erosion of glacial edges and flow of excessive

freshwater into rivers
leading to floods.

Impact of GLOFs —

1. Flooding in downstream areas and grave damage to life and property.
2. change in course of rivers
3. loss of freshwater stored in glaciers.
4. loss of biodiversity and freshwater fishes and aquatic ecosystem.
5. Fixal burden and loss of canal infrastructure like roads, railways.
6. Adverse impact on vulnerable communities leading to socio-economic disparities.

measures taken by Govt -

1. India Meteorological Dept is involved in aerial research and mapping of major glaciers.
2. Risk assessment conducted by MoES in coordination with IMD by mapping vulnerabilities.
3. Rehabilitation programmes for communities inhabiting disaster prone areas.
4. Controlling construction activities and climate sensitive planning at Gram Panchayat level.

Therefore, in addition to rehabilitative measure, preventive measures are required.

Q. 17.

Radiometric dating is used for various purposes like archaeological research, scientific dating of fossils & exploration of natural resources.

Working of radiometric dating - Carbon is present in all lifeforms and it has a fixed rate of decay. After the death of a lifeform, Carbon 14 (C^{14}) decays at a fixed rate which is measured to calculate age of any fossil or object.

Limitations -

1. Radiometric dating cannot be used for inanimate objects precisely.
2. High cost of technology
3. Lack of skilled personnel to carry out the procedure on large scale.
4. Budgetary constraints to employ radiometric dating due to requirement of many ancillary resources like digging equipment.

Potential advantages of
using calcium 41 radiometric
dating :

1. Covers a broad spectrum of objects that can be

dated including inanimate
structures.

2. more precision by calculating
exact age of fossils
directly.

3. lesser chance of interference
to decay rate compared
to C14 which is more
variable to anaerobic
conditions.

Therefore, adoption of calcium
14 can improve the scope
and results of radiometric
dating.

Q. 18.

ePharma entails providing digital services like online marketplace and retail for pharma products, tele-medicine and delivery of products.

Concerns over epharma -

1. Resistance from conventional pharma lobby which may suffer loss of revenue.
2. Lack of regulations & guidelines on ePharma and no regulatory framework.

3. Lack of mechanisms to check quality and authenticity of drugs available.
4. Scope of exploitation of consumer by hampering competition by predatory pricing.

Measures required

1. Enacting statute regulating epharma marketplaces and rules for FDI and advent of imported drugs.
2. Inclusion of epharma under National Pharma Pricing Authority and CDSO.

3. Establishing institutions to conduct quality checks and prevent exploitation of consumer.

Therefore, synergy between epharma and National Digital Health Mission can ensure creation of digital ecosystem to increase accessibility and availability.

Q. 19.

According to Report presented by Ministry of Home Affairs in Lok Sabha, incidence of Left wing Extremism has reduced by 92% from record high in 2019.

Factors for decline -

1. Stringent implementation of NAPA and increased deployment of security forces.

2. Developmental activities in affected regions.

Eg: "Education City Campaign" in Bastar by OP Chandhary.

3. Construction of infrastructure roads through convergence of MGNREGA and welfare schemes.
4. Rehabilitation schemes for extremists who surrender including skill development and vocational training with payment of stipend for 3 yrs.
5. Inclusion of LWE affected districts in mainstream economy leading to decline in no. of districts in all 10 states with most successful decline in Odisha.

likely end of LWE -

1. no. of districts effected in Jharkhand have increased, whereas chattisgarh remains constant.
2. Spread of LWE to newer areas of North-east.
3. Even though likely end of LWE has not been achieved, same is not far as various measures are being undertaken.

By tackling the cause of LWE which was lack of development, social and economic exclusion and radicalisation because of perceived neglect, MHA has been successful.

Q. 20.

Money laundering, tax evasion and terror financing thrive through a nexus and employ similar route for carrying out illegal activities.

Political challenges -

1. Implementation of PMLA, 2013 suffers from lack of political will & increased criminalisation of politics.
2. Nexus b/w money, capitalism, bureaucrats and politicians prevents

Efficient functioning of enforcement agencies.

Legal challenges:

1. Lack of coordination b/w enforcement agencies
2. Overlapping mandates of ED under PMCA, state police and Anti Corruption Bureaus and tax authorities
3. Lack of organised institutional framework to deal with money-laundering and tax-evasion collectively.
4. High pendency in judiciary and procedural delays.

Operational challenges

1. Existence of hawala routes, round-tripping & tax evaded money.
2. Lack of international coordination to tackle money-laundering.
3. Lack of effectiveness of FATF which does not focus on tax havens like Panama etc.
4. Tax havens allowing easy entry to laundered money & whitening of money through their banks & institutions.

Therefore anti-money laundering measures are in need of holistic implementation