

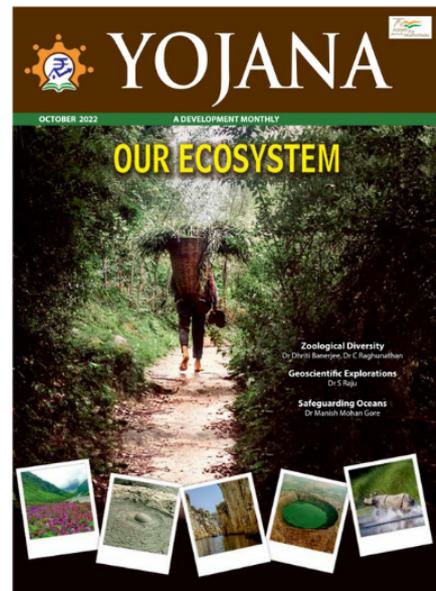
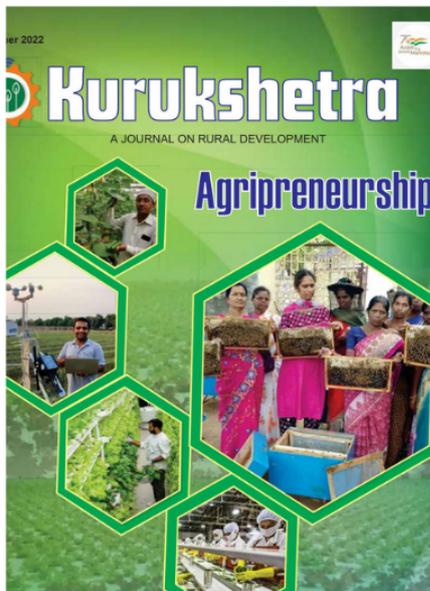
OFFICERS' Pulse

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1) Do not ignore the role of the woman livestock farmer

(GS1: Role of Women and Women's Organization, Population and Associated Issues, Poverty and Developmental issues, Urbanization, their problems and their remedies)

Context

- The livestock sector is one of the most **rapidly growing components** of the rural economy of India, accounting for **5% of national income** and **28% of agricultural GDP in 2018-19**.
- In the last six years, the **livestock sector** grew at **7.9%** (at constant prices) while **crop farming** grew by **2%**.
- There is a need to recognise the role of women in livestock rearing, and to include women in all facets of livestock development, be it **breeding, veterinary care, extension services, training or access to credit and markets**.

Women in Agri & Allied Sector

- It is widely recognised that the majority of women workers in rural areas (**72%**) are engaged in agricultural activities.
- There were **five million women members** in **dairy co-operatives in 2015-16**, and this increased further to **5.4 million** in **2020-21**.
- Women accounted for **31%** of all members of **dairy producer cooperatives** in 2020-21. In India, the number of women's dairy cooperative societies rose from 18,954 in 2012 to 32,092 in 2015-16.

Issues with Data Collection

- Conventional labour force surveys fail to accurately record women's work in livestock-raising for many reasons.
- Among the many problems in data collection, two significant ones are the **sporadic nature of work**

undertaken for short spells throughout the day and often carried out within the homestead, and **women's own responses**. Given the pattern of work, the woman herself **may not report "livestock raising"** as an **economic activity**.

- One way to adjust official statistics for this error is by calculating an **augmented work participation rate**.
- In other words, in addition to women reporting themselves as engaged in economic activity, this estimate includes women who reported themselves as "engaged in domestic duty" or care work for the major part of the year but spent time on specific activities such as kitchen gardening, household dairy/poultry, paddy husking, etc.

An Underestimation

- To illustrate, 12 million rural women were workers in livestock-raising, an estimate based on the Employment and Unemployment Survey of 2011-12. However, with the **augmented definition**, it is estimated that around **49 million rural women** were engaged in livestock raising.
- In short, women actually engaged in the livestock economy were **four times the official estimate** and a sizeable section of the rural population.

Core Problems

- First, recent employment surveys such as the **Periodic Labour Force Survey** fail to collect data on **specific activities** of persons engaged primarily in domestic duties. So, the **undercounting of women** in the livestock economy continues.
- Second, the **reach of extension services** to women livestock farmers **remains scarce**. According

to official reports, **80,000 livestock farmers were trained** across the country in 2021, but we have **no idea** how many were **women farmers**. In the village surveys, only a few women in each village reported receiving any information from extension workers. Women wanted information but wanted it nearer home and at times when they were free.

- Third, in village surveys, women in poor households, **without collateral** to offer to banks, found it **difficult to avail loans to purchase livestock**.
- Fourth, women livestock farmers **lack technical knowledge** on choice of animals (breeding) and veterinary care. According to the village surveys, **men invariably performed** these specific tasks and **took animals for artificial insemination**.
- Fifth, recent studies show that women were **not aware of the composition and functions of dairy boards** and that **men exercised decisions** even in women-only dairy cooperatives. Further, the **voice of women** from landless or poor peasant Scheduled Caste households was **rarely heard**.

Way Forward

- Women's labour is critical to the livestock economy. It follows then that women should be included in every stage of decision-making and development of the livestock sector.
- Today, women livestock workers remain invisible on account of their absence in official statistics. This must be corrected.

2) A new lease of LiFE for climate action

(GS3: Conservation, Environmental Pollution and Degradation, Environmental Impact Assessment)

Context

- The **United Nations Development Programme's "Human Development Report"** has warned that global **human development measures have declined** across most countries in the past two years. This comes against the backdrop of the greatest existential threat of all — the **triple planetary crisis of climate change, pollution and biodiversity loss**.
- **Nine** of the **warmest years** on record have come in the **past decade** alone. This year's record-breaking heat waves, floods, droughts, and other extreme forms of weather have forced us to face these increasingly devastating impacts.

LiFE, a fresh perspective

- **LiFE, or Lifestyle for Environment**, recently launched by India, brings a fresh and much-needed perspective. Rather than framing climate change as a 'larger than life' challenge, **LiFE recognises that small individual actions can tip the balance in the planet's favour**.
- But we need guiding frameworks, information sharing and the scale of a global movement. Mindful choices cultivated by LiFE animate this spirit — actions such as **saving energy at home; cycling and using public transport** instead of driving; **eating more plant-based foods** and **wasting less**; and leveraging our position as customers and employees to **demand climate-friendly choices**.
- Many of the goals of LiFE can be achieved by deploying '**nudges**', gentle persuasion techniques to **encourage positive behaviour**.

- The **UN Environment Programme (UNEP)** employs proven nudging techniques such as **discouraging food waste** by offering smaller plates in cafeterias; **encouraging recycling** by making bin lids eye-catching; and **encouraging cycling** by creating cycle paths.
- According to the UNEP, **more than two-thirds of greenhouse gas emissions** can be attributed to **household consumption and lifestyles** — the urgent cuts to global emissions we need can only be achieved through widespread adoption of greener consumption habits.
- And while LiFE is a global vision, India is an excellent place to start. With over 1.3 billion people, if we achieve a **true jan andolan** (people's movement) here, the momentum generated will be enormous.

India's track record

- With the launch of LiFE, India is calling on all consumers across the world to become **"Pro Planet People"** by **2027, adopting simple lifestyle changes** that can collectively lead to transformational change.
- India has a proven track record translating the aspirations of national missions into whole-of-society efforts.
- The success of the **Swachh Bharat Mission**, which mobilised individuals and communities across socio-economic strata to become drivers of collective good health and sanitation, is an example.
- The LiFE mission also recognises that **accountability is relative to contribution. Emissions** across the **poorest half** of the world's population combined still **fall short** of even **1% of the wealthiest**.

- Those who consume the least, often the most vulnerable and marginalised members of society, will not be asked to consume less, but rather supported to participate in the green economy. Each 'Pro Planet' stakeholder is nudged according to **differentiated approaches**.

Onus on the developed world

- The same applies across countries. LiFE resonates with the **global climate justice** India has rightfully called for — highlighting **enhanced obligations those in developed countries** bear, to support climate adaptation and mitigation for those most affected, yet least responsible.
- The **average carbon footprint** of a person in a **high income country** is **more than 80 times** higher than that of a person in a **least developed country**.
- And there has never been a better time for India's leadership on climate action, at home and on the international stage.
- From the **Panchamrit targets** announced by India at COP26, to support for the **International Solar Alliance**, the **Coalition for Disaster Resilient Infrastructure** and **South-South cooperation platforms**, from the world's fifth largest economy with vibrant businesses making enormous investments in renewables and electric mobility, to a world class public digital tech stack, India brings scale, expertise and legitimacy; a well-positioned founding UN Member State bridging the G20 and G77.

Way Forward

- With COP27 in November, and India set to assume the G20 Presidency weeks after, followed by the halfway mark to Agenda 2030 next year, the committed partners

in this mission will help to give a new lease of LiFE to climate action.

3) Food day as a reminder to 'leave no one behind'

(GS2: Issues relating to Poverty and Hunger)

Context

- Globally, food and nutrition security continue to be undermined by the impacts of the COVID-19 pandemic, climate change, spiralling food inflation, conflict, and inequality.
- Today, around **828 million people worldwide do not have enough to eat** and over **50 million** people are facing **severe hunger**.
- **The Hunger Hotspots Outlook (2022-23)** — a report by the **Food and Agriculture Organization** of the United Nations (FAO) and **World Food Programme (WFP)** — forebodes escalating hunger, as over 205 million people across 45 countries will need emergency food assistance to survive.

Better Production

- **India** is now **one of the largest agricultural product exporters** in the world. During **2021-22**, the country recorded **\$49.6 billion** in total agriculture exports — a **20% increase** from 2020-21.
- However, recent **climate shocks** have raised **concerns about India's wheat and rice production** over the next year. Given climate shocks and extreme weather phenomena, it is important to place a **greater focus on climate adaptation and resilience building**.
- By 2030, India's population is expected to rise to 1.5 billion. Agri-food systems will need to provide for and sustainably support an increasing population.
- There is an increased recognition to move away from conventional

input-intensive agriculture towards more **inclusive, effective, and sustainable agri-food systems** that would facilitate better production.

- Some initiatives by the Government of India on better production include **Paramparagat Krishi Vikas Yojana**, which promotes organic farming; **Pradhan Mantri Krishi Sinchayee Yojana**, which focuses on more crops per drop for improved water use, and **Soil Health Management** which fosters Integrated Nutrient Management under the National Mission for Sustainable Agriculture.

Better Nutrition

- One of India's greatest contributions to equity in food is its **National Food Security Act (NFSA) 2013** which anchors the Targeted Public Distribution System (TPDS), the **PM POSHAN scheme** (earlier known as the Mid-Day Meals scheme), and the **Integrated Child Development Services (ICDS)**. Today, India's food safety nets collectively reach over a billion people.
- The Government continues to take various measures to improve these programmes with digitisation and measures such as **rice fortification, better health, and sanitation**.
- India must continue to lead by example on the **principle of leaving no one behind**.

Better Environment

- Nutrition and agricultural production are not only impacted by climate change but also linked to environmental sustainability.
- The **degradation of soil** by the excessive use of chemicals, non-judicious water use, and declining nutritional value of food products need urgent attention.

- **Millets**, which fell out of fashion a few decades ago, have **received renewed attention** as crops that are **good for nutrition, health, and the planet**. Millets are **climate-smart crops** that are **drought-resistant**, growing in areas with **low rain and infertile soil**.
- They are **hardier than other cereals, more resilient to changes in climate**, and **require less water** to cultivate (as much as 70% less than rice), and **less energy to process** (around 40% less than wheat).
- Since they **need fewer inputs**, they are **less extractive for the soil** and can **revive soil health**. Additionally, their **genetic diversity ensures that agrobiodiversity is preserved**.
- India has led the global conversation on reviving millet production for better lives, nutrition, and the environment, including at the United Nations General Assembly, where it appealed to declare **2023 as the International Year of Millets**.
- India is also the **world's leading producer of millets**, producing around **41% of total production** in 2020.
- To enhance the area, production, and productivity of millets the national government is implementing a **Sub-Mission on Nutri-Cereals (Millets)** as part of the **National Food Security Mission**.
- Millet conservation and promotion contribute to **addressing food security, improved nutrition, and sustainable agriculture**, which aligns with the **Sustainable Development Goals** agenda.
- Millet production has been proven to **enhance biodiversity and**

increase yields for smallholder farmers, including rural women.

Way Forward

- It is clear that the path to a better life resides in **transforming food systems**, making them more resilient and sustainable with a focus on equity, including by incentivising the protection of the common people.
- India can lead the global discourse on **food and nutrition security** by showcasing home-grown solutions and best practices, and championing the principle of leaving no one behind — working continuously to make its food system more equitable, empowering, and inclusive.

4) Strengthening the CSR framework is a profitable idea

(GS3: Effects of Liberalization on the Economy, Changes in Industrial Policy and their Effects on Industrial Growth)

Context

- Ever since the establishment of the Corporate Social Responsibility (CSR) regime in India under the Companies Act 2013, CSR spending in India has risen from ₹10,065 crore in 2014-15 to ₹24,865 crore in 2020-21.
- Any company that has a **net worth of at least Rs 500 crore, a turnover of Rs 1,000 crore or a net profit of Rs 5 crore** is obliged to spend **2% of its average profits** over the last three years on CSR.
- Businesses can invest their profits in areas such as education, poverty, gender equality, and hunger as part of their CSR compliance, as regulated by the law.

Geographical Bias

- The CSR rules state that companies should **give preference to local areas/areas around it** where it operates.

- However, a report by Ashoka University's Centre for Social Impact and Philanthropy says that **54% of CSR companies** are concentrated in **Maharashtra, Tamil Nadu, Karnataka, and Gujarat** while populous **Uttar Pradesh and Madhya Pradesh** receive little.

Little Focus on Environment

- The rules also deal with **broader environmental issues** to create a countervailing effect.
- However, an analysis of CSR spending reveals that while most CSR spending is in **education (37%) and health and sanitation (29%)**, only **9%** was spent on the **environment** even as extractive industries such as mining function in an environmentally detrimental manner in several States.

Overview of Spending

- Under the existing regulation, CSR is a **board-driven process**, and the Board of the company is empowered to **plan, approve, execute, and monitor** the CSR activities of the company.
- A major issue with this design is that it **focuses on output rather than quality of the expenditure and its impact**.
- The **Standing Committee on Finance** had also observed that the information regarding **CSR spending by companies is insufficient and difficult to access**.

A pathway to follow

- There is a need to curate a **national-level platform centralised by the Corporate Affairs Ministry (MCA)** where all States could list their potential CSR-admissible projects so that companies can assess where their CSR funds would be most impactful across India with, of course,

preferential treatment to areas where they operate.

- Companies need to **prioritise environmental restoration** in the area where they operate, earmarking at least 25% for environment regeneration.
- All CSR projects should be selected and implemented with the **active involvement of communities, district administration and public representatives**.
- Other recommendations include **strengthening the reporting mechanisms with enhanced disclosures** concerning selection of projects, locations, implementing agencies, etc. and **mandatory independent third-party impact assessment audits**.

5) Gubernatorial procrastination is unreasonable

(GS2: Functions and Responsibilities of the Union and the States, Issues and Challenges Pertaining to the Federal Structure, Devolution of Powers and Finances up to Local Levels and Challenges Therein)

Context

- A bill passed by the State Assembly becomes law only after it is **assented to by the Governor**. The Governor being a part of the State legislature, the process of law making is complete only when he signs it, signifying his assent. Thus, the Governor's assent becomes the most crucial act in the whole law-making process.

Examples of Kerala and Tamil Nadu

- But the Governor's assent has, of late, become a controversial issue in at least two States — Kerala and Tamil Nadu.
- In Tamil Nadu, the Governor forwarded the Bill for exemption from the National Eligibility cum Entrance Test (NEET) to the

President after considerable delay. In Kerala, the Governor publicly announced that he would not give assent to the Lokayukta Amendment Bill and the Kerala University Amendment Bill.

- Such actions by Governors throw the legislative programmes of governments out of gear because of the uncertainty surrounding the assent.
- Therefore, the question of whether a Governor is permitted by the Constitution to cause uncertainty in the matter of giving assent to the Bills passed by State legislatures assumes great importance.

Constitutional Powers

- **Article 200** of the Constitution provides certain options for the Governor to exercise when a Bill reaches him from the Assembly.
- He may **give assent or he can send it back to the Assembly requesting it to reconsider** some provisions of the Bill, or the Bill itself. In this case, if the **Assembly passes the Bill** without making any change and sends it back to the Governor, he will have to **give assent** to it.
- This provision contained in Article 200 **unambiguously affirms the primacy of the legislature** in the legislative exercise.
- The third option is to **reserve the Bill for the consideration of the President**. The provision concerned makes it clear that a Bill can be reserved for the consideration of the President **only if the Governor forms an opinion that the Bill would endanger the position of the High Court by whittling away its powers**.
- The **Constitution does not mention any other type of Bill** which is required to be reserved for the consideration of the President.

Nevertheless, the courts have conceded a **certain discretion to the Governors** in the matter of sending Bills to the President.

- The fourth option is to **withhold the assent**. But it is **not normally done** by any Governor because it would be an **extremely unpopular action**. The legislature reflects the will of the people and is the constitutionally designated body to make laws.
- If the Governor who does not reflect in any way the aspirations of the people of the State refuses assent, and thereby **defeats the legislative programme of the elected government**, it would be **against the spirit of the Constitution**.
- The fact that the Constitution **does not mention the grounds** on which a Governor may **withhold assent to a Bill** shows that this power should be **exercised by the Governor extremely sparingly and after very careful consideration** of the consequences of such action.

Practices Overseas

- In this context it would be useful to examine the practice in the **United Kingdom**. There too **royal assent** is necessary for a Bill to be passed by Parliament to become law and the crown has the power to withhold assent. But it is a **dead letter**. By practice and usage there is **no power of veto exercised by the crown** in England now.
- Moreover, **refusal of royal assent** on the ground that the monarchy strongly disapproves of the Bill or that the Bill is very controversial is **treated as unconstitutional**.
- In the **United States**, the **President is empowered** by the Constitution **to refuse assent and return a Bill to the House but if the Houses**

again pass it with **two thirds of each House** the **Bill becomes law**.

- The lesson to be drawn from these practices is that **refusal of assent is a practice which is not followed in other democratic countries**. And in some contexts, it is **unconstitutional or the Constitution itself provides a remedy** so that the Bill passed by the legislature could become law even after the refusal of assent.
- The **Indian Constitution**, however, **does not provide any such remedy**. When the Governor withholds assent, the whole legislative exercise will become fruitless. It does not square with the best practices in old and mature democracies.

Issue of Challenge

- In this context, a legitimate question that arises is whether the **government of a State can challenge the refusal of assent by the Governor in a court of law**.
- **Article 361** of the Constitution **prohibits the court** from initiating proceedings against a Governor or the President for any act done in exercise of their powers.
- They enjoy **complete immunity** from court proceedings. It is a unique situation where a government is placed in a situation of having to challenge a Governor's action of withholding assent to a Bill.
- It may be noted that the Governor while declaring that he withholds assent will have to **disclose the reason for such refusal**. Being a high constitutional authority, the Governor **cannot act in an arbitrary manner** and, therefore, will have to give reasons for refusing to give assent.
- If the **grounds for refusal disclose mala fide or extraneous**

considerations or ultra vires, the Governor's action of refusal could be **struck down as unconstitutional**.

- This point has been settled by a Constitution bench of the Supreme Court in **Rameshwar Prasad and Ors. vs Union Of India and Anr.** The Court held: "the immunity granted by Article 361(1) does not, however, take away the power of the Court to examine the validity of the action including on the ground of mala fides".
- However, the court will **not be able to direct the Governor to act in a particular way**. Invalidation of the refusal to give assent to a Bill on the ground of mala fide, etc. leaves such other options to him to exercise — as mentioned in Article 200.

Conclusion

- It is claimed that since the Constitution **does not fix any timeline** for the Governor to decide the question of assent, he can wait for any length of time without doing anything. This is **illogical** and militates **against the constitutional scheme** in respect of law making by the legislatures.
- Not fixing any time line does not and cannot mean that the Governor can indefinitely sit on the Bill that has been passed by an Assembly. Article 200 does not contain such an option. The Governor is required to **exercise one of the options** mentioned in that Article.
- All constitutional authorities are required to act in a reasonable manner. Unreasonable acts are unsustainable in law.

6) Building resilient mineral supply chains

(GS3: Infrastructure: Energy, Ports, Roads, Airports, Railways etc)

Context

- Prime Minister Narendra Modi recently exhorted the country to pursue **aatmanirbharta in energy** by focusing on clean energy technologies.
- Concerns over the pricing and availability of oil and gas in the wake of the Ukraine crisis continue to fuel global policy debates on energy security.
- However, the **fragility of clean energy supply chains** obscures pathways for countries to reduce dependence on fossil fuels.
- Imported inflationary pressures through exposure to volatile oil and gas markets also pose **risks to macroeconomic growth and stability**, particularly for **India, import-dependent for around 85% of its oil and half of its gas needs**.
- Therefore, **securing access to key minerals** such as lithium, cobalt, nickel and rare earth metals is critical for building resilient and indigenous supply chains for clean energy technologies.

A Challenging Task

- However, this is challenging on several counts.
- First, **reserves are often concentrated** in regions that are **geopolitically sensitive or fare poorly from an ease of doing business perspective**.
- Second, a portion of **existing production** is controlled by **geostrategic competitors**. For example, **China** wields considerable influence in cobalt mining in the Democratic Republic of Congo through direct equity investments and its Belt and Road Initiative.
- Third, **future mine production** is often tied up in **offtake agreements**, in advance, by buyers from other countries to cater to upcoming demand.

Recommendations

- As a first step towards the sourcing of strategic minerals, the Indian government established **Khanij Bidesh India Limited (KABIL)** in **2019** with the mandate to **secure mineral supply for the domestic market**. KABIL is a joint venture company of three Central Public Sector Enterprises under the Ministry of Mines.
- Based on a Council on Energy, Environment and Water (CEEW) study, there are suggestions that policymakers could consider to further this objective.
- First, **figure out the mineral requirements of the domestic industry**. This could best be accomplished by a **task force** which includes the ministries of power, new and renewable energy, heavy industry, and science and technology.
- Creating **five-year road maps with clear targets** for deployment and indigenous manufacturing across clean energy applications would provide visibility to domestic investors. Further, **assess the technology mix** that would support this deployment. On this basis, determine the quantities of minerals necessary to support indigenous manufacturing.
- Second, **coordinate with the domestic industry to determine where strategic interventions by the government would be necessary** for the purpose. KABIL could **collaborate with industry** to bolster its market intelligence capabilities for tracking global supply-side developments.
- Developing a granular picture of available and committed production capacities and economy-wide and sector-specific policy developments is the first step

to develop an informed perspective on mineral supply.

- If there is adequate visibility on sourcing opportunities in conducive geographies, the **private sector should be encouraged** to secure minerals for its own requirements.
- Third, if **conducive investments opportunities** don't exist, **KABIL should pre-emptively sign offtake agreements** with global mineral suppliers to secure future production.
 - *An offtake agreement is an arrangement between a producer and a buyer to purchase or sell portions of the producer's upcoming goods.*
- Fourth, the government should **jointly invest in mining assets** with **geostrategic partners**. The External Affairs Ministry could initiate conversations with partner countries. Establishing **resilient clean energy supply chains** is a priority for the **Quad**, for instance.
- Fifth, **support technologies that utilise domestically available materials**. The deployment of technologies such as **sodium-ion batteries** could reduce requirements for sourcing minerals from beyond India's borders.
- Lastly, develop policies on **urban mining** aimed at **recycling mineral inputs** from deployments that have completed their useful life. These could help further **reduce dependence on international sourcing**.

Conclusion

- Besides Ukraine, other potential geopolitical flashpoints also exist against a backdrop of dwindling multilateral cooperation. India must act immediately and decisively to mitigate these risks to its energy security.

7) AatmaNirbharta through Agripreneurship

(GS3: Food Processing and Related Industries in India- Scope' and Significance, Location, Upstream and Downstream Requirements, Supply Chain Management)

Context

- **Agriculture** remains one of the key sectors of the Indian economy, accounting for around **18-20 percent share in the gross domestic product**. Approximately, **70 percent of the rural population** depends on agriculture and allied sectors for their livelihood.
- Relatively poorer infrastructural facilities are one of the key push factors, while better job opportunities in urban areas is one of the important pull factors contributing to the growing **rural-urban migration**.
- In this backdrop, one of the options which mitigates the burden on agriculture, while at the same time arrests rural-urban migration, is **agripreneurship** i.e. entrepreneurship in agriculture and its allied sectors.

Significance of Agripreneurship

- Agripreneurship is the **profitable confluence of agriculture and entrepreneurship** brought in by the people with innovative ideas to develop the existing practices for better productivity as well as establishment of new ventures in agriculture and allied sectors.
- Developing entrepreneurs in agriculture can solve problems by
 - reducing the burden of agriculture;
 - generating employment opportunities for rural youth;
 - controlling migration from rural to urban areas;

- increasing national income;
- supporting industrial development in rural areas;
- reducing the pressure on urban cities.
- Agripreneurship spans across various sub sectors, viz. **food processing, fisheries, tissue culture, apiary, seed processing, smart agri-tech provisioning, soil testing, vermi-compost, etc.**

Women in Agripreneurship

- In recent years, the growth of start-ups and new-generation enterprises in India has been manifold. However, the **number of women participating in the entrepreneurship activities has been relatively less**, when compared to the number of their men counterparts.
- Similarly, **World Bank's India Development Report 2018** has revealed that **India has one of the lowest female participation in the workforce** with a **rank of 120** out of 131 countries.
- There is an urgent need to design the institutional strategies to promote the ecosystem for promoting women entrepreneurship in general and women agripreneurship in particular, which is essential for the integrated development of India.

Challenges

- One of the major challenges in promoting entrepreneurship is the **low literacy level of rural folks**.
- The poor and small/marginal farmers are **unable to access the modern infrastructure and technology** for better productivity and ease of work.
- Rural marketers have much **less threat bearing capability** because of loss of economic sources and outside support. Even though various developmental activities

are going on, the **development of technologies is very slow** as compared to developed nations like USA and European countries.

- **Management troubles** like i) lack of technological dissemination, ii) legal formalities, iii) lack of technical understanding, iv) poor quality control are the other bottlenecks in the growth of agripreneurship.

Policies and Programmes for Promoting Agripreneurship

1. RKVY-RAFTAAR:

- The **Ministry of Agriculture & Farmers Welfare** revised the Rashtriya Krishi Vikas Yojana in 2017 as **Rashtriya Krishi Vikas Yojana Remunerative Approaches for Agriculture and Allied sector Rejuvenation (RKVY-RAFTAAR)**.
- The scheme aims at **making farming a remunerative economic activity**. For this purpose, the scheme provides for **financial support and nurtures the incubation ecosystem** by strengthening farmers' efforts, risk mitigation, focus on development and creation of pre and post harvest infrastructure, promoting agripreneurship and innovations.
- RKVY-RAFTAAR includes agripreneurship orientation, with a stipend for the entrepreneur; seed stage funding and funding for incubatees.

2. PM Formalisation of Micro Food Processing Enterprises Scheme:

- The **Ministry of Food Processing Industries** is implementing the **PM Formalisation of Micro Food Processing Enterprises Scheme** to provide financial, technical and business support for upgradation of existing micro food processing enterprises.

- The scheme aims to enhance the competitiveness of existing individual microenterprises in the unorganised segment of the food processing industry and promote formalisation of the sector.

3. Agriculture Infrastructure Fund:

- As a part of the AatmaNirbhar Bharat Package, an Agriculture Infrastructure Fund was launched in 2020 as a dedicated Central Government scheme for **providing medium to long term credit facility for investment in creation of post-harvest management infrastructure and community farming assets.**
- The sanctioned infrastructure projects include warehouses, assaying units, primary processing units, custom hiring centres, sorting and grading units, cold store and cold chain projects, bio-stimulant manufacturing facilities, seed processing units, etc.

4. Udyam Portal:

- Enterprises with an **investment on plant and machinery or equipment of up to Rs. 50 crore** and a **turnover of Rs. 250 crore** can register on the **Udyam registration portal** of the **Ministry of Micro, Small and Medium Enterprises (MSME)**, and avail benefits of Priority Sector Lending of banks and also those of programmes and schemes of the Ministry of MSME.

5. Gramodyog Vikas Yojana:

- Gramodyog Vikas Yojana of the **Ministry of MSME** is an **artisan centric programme** implemented with the aim of revival of traditional and inherent skills of rural artisans in village industries.
- The scheme has a **special focus on the Agro Based and Food Processing Industry.**

- There is an urgent need for promoting entrepreneurial culture among people in the country. Providing **area-specific technical training programmes** may help to develop the technical competence of potential entrepreneurs. Such initiatives will certainly need to be supplemented by **adequate infrastructural facilities.**
- The financial institutions and banks which assure prompt financial security to entrepreneurs must create **unique cells for providing easy finance to rural entrepreneurs.**
- The rural entrepreneurs need to be provided **finance at concessional interest and easy repayment terms.** The **burdensome sanctioning procedures should be minimised.**
- **Proper supply of scarce raw materials** should be made on a priority basis. A **subsidy** could also be offered to make the products manufactured by rural entrepreneurs cost competitive and remunerative.
- **Voluntary organisations** can arrange training programmes to provide them stimulation, counselling and assistance.
- Proper encouragement and assistance should be provided to rural entrepreneurs for setting up **marketing co-operatives.**
- An important ingredient for the success of any development strategy is the **awareness it generates amongst all stakeholders.** For this purpose, a **converging approach** is required amongst the initiatives being taken by the various Ministries/Departments of the Central Government, along with those of the state governments.

Way Ahead

- A convergence of their approach would go a long way in making the agripreneurs self-reliant and through them make the country AatmaNirbhar.

8) Artificial Intelligence in Agripreneurship

(GS3: Awareness in the fields of IT, Space, Computers, Robotics, Nano-technology, Bio-technology and issues relating to Intellectual Property Rights)

Context

- Agriculture remains one of the world's most pressing problems today. The increase in population has led to an increased demand for food. It is believed that **70 percent more food would need to be produced to meet the demands.**
- Therefore, a pressing need to find new ways to sustainably raise agricultural output, strengthen the international food supply system, cut down on food waste, and feed everyone hungry or malnourished has to be on the top of the priority list.
- Therefore, the advancement of technology and particularly the use of this technology in countries across the globe to sustain and provide food security are imperative.

Scope of AI

- Agriculture is a high-priority sector of the Indian economy, as **58 percent of the country's families are dependent** on it in some way, either directly or indirectly, for their means of subsistence.
- Agriculture is one of the most fertile industries there are for artificial intelligence (AI) and machine learning (ML).
- AI, machine learning and the Internet of Things (IoT) sensors that provide real-time data for algorithms **increase agricultural**

efficiencies, improve crop yields and reduce food production costs.

Areas with Maximum Potential

- **Cognitive computing** has become the most disruptive technology in agricultural services as it can **learn, understand, and interact with different environments to maximize productivity.**
- **Microsoft** is currently working with 175 farmers in Andhra Pradesh to provide agricultural, land and fertilizer advisory services. This initiative has already resulted in **30 per cent higher average yield** per hectare.
- **Proximity sensing, remote sensing, IoT and image-based Precision Farming** are being used for **intelligent data integration** related to historical meteorology, soil reports, etc.
- **Image recognition using artificial intelligence approaches** for plant identification, pest infestation and disease diagnosis is also becoming prevalent.
- Using **AI and machine learning-based surveillance systems** to monitor every crop field's real-time video feed identifies animal or human breaches, sending an alert immediately can become very useful to prevent crop damages.
- **Yield mapping** to find patterns in large-scale data sets and **optimizing irrigation systems** to measure effectiveness of frequent crop irrigation is invaluable for crop planning.
- Today, there is a shortage of agricultural workers, making **AI and machine learning-based smart tractors, agribots and robotics** a viable option for many remote agricultural operations that struggle to find workers. These robots can harvest faster, locate

and remove weeds more accurately, and thus reduce operating costs and dependence on labour.

- In the meantime, farmers are already turning towards **chatbots** for help. Chatbots help farmers by answering their questions and provide advice and guidance on specific agriculture and yield related queries.
- The use of technology has also spread its wings to allied activities such as **dairy farming**. Artificial intelligence (AI) has emerged as one of the most important strategies ever developed for **enhancing the genetics of farm animals**. Its most prevalent use is in **dairy cow breeding**. The use of artificial insemination protects sires from contracting contagious illnesses, which in turn lowers the likelihood that a disease would spread.

Challenges

- Artificial Intelligence systems **require a lot of data** to train machines and make accurate predictions. It is **difficult to find temporal data** for large agricultural areas, although spatial data are easy to collect.
- Since data infrastructure requires maturity, it **takes time to develop** a powerful machine learning model.
- Another important disadvantage is the **inflated cost of the many different solutions** available in the agricultural market. Solutions need to be **more affordable and open-source** so that technology can be accessed even at the farm level.

Way Forward

- With consistent efforts and scalable innovations by both the public and private sector, these technological interventions can completely

overhaul agriculture and change the lives of farmers, for better.

9) Organic Farming

(GS3: Conservation, Environmental Pollution and Degradation, Environmental Impact Assessment)

Context

- Organic farming is a system which **avoids or largely excludes the use of synthetic inputs** (such as fertilizers, pesticides, hormones, feed additives etc) and to the maximum extent feasible rely upon **crop rotations, crop residues, animal manures, off-farm organic waste, mineral grade rock additives and biological system of nutrient mobilization and plant protection**.
- Organic agriculture promotes and enhances agro-ecosystem health, including biodiversity, biological cycles and soil biological activity.

Need of Organic Farming

- Scientists have realized that the 'Green Revolution' with high input use has reached a plateau and is now sustained with diminishing returns of falling dividends. Thus, a natural balance needs to be maintained for the existence of life and property.
- Organic farming not only adequately addresses issues of soil, ecology and human health but also gives impetus to sustainable agriculture.

Key Characteristics of Organic Farming

- **Protecting the long term fertility of soils** by maintaining organic matter levels, encouraging soil biological activity, and careful mechanical intervention;
- **Providing crop nutrients indirectly** using relatively insoluble nutrient sources which are made available to the plant by the action of soil micro-organisms;

- **Nitrogen self-sufficiency** through the use of legumes and biological nitrogen fixation, as well as effective recycling of organic materials including crop residues and livestock manures;
- Weed, disease and pest control relying primarily on **crop rotations, natural predators, diversity, organic manuring, resistant varieties and limited thermal, biological and chemical intervention**;
- **Extensive management of livestock**, paying full regard to their evolutionary adaptations, behavioural needs and animal welfare issues with respect to nutrition, housing, health, breeding and rearing;
- **Careful attention to the impact of the farming system on the wider environment** and the conservation of wildlife and natural habitats.

Benefits of Organic Farming Practices

- Organic farming **minimizes the use of pesticides and chemicals**, thereby reducing major environmental issues.
- **Crop rotation increases soil fertility**, and growing animals naturally helps **advance biodiversity**, with greater health benefits across all living species.
- Organic farming does not rely on synthetic fertilizers that contribute to a greater cause of **energy conservation**. Energy usage is lowered by at least 30–50% in organic farming systems.
- Organic farming **improves soil and reduces soil erosion**. In addition, soils with improved structure and higher content of organic matter promote **better water management** in agriculture.
- Organic farming is a sustainable and long-term method for food

production as it takes a **proactive and preventative approach**.

Major Challenges in Promoting Organic Farming in India

- **Lack of awareness** among farmers about organic farming and its benefits.
- **Marketability of organic produce** over conventional produce must be assured. Inability to obtain a premium price for the produce during the initial stage leads to losses.
- **Shortage of essential nutrients** in the soil leads to low productivity. Biomass rich soil is essential to improve nutrition for plant uptake.
- The **cost of organic inputs** is more than that of industrially produced agrochemicals used in the conventional farming system.
- Organic farming requires **more time for observation, timely control, and intervention**. It is naturally more **labor-intensive**.

Programmes and Policies for Organic Farming

1. Paramparagat Krishi Vikas Yojana (PKVY):

- The Government of India has been implementing the Paramparagat Krishi Vikas Yojana since 2015-16 to **promote chemical free organic farming in the country in cluster mode**.
- Under the programme, **financial assistance of Rs 50000/ha for 3 years** is provided for cluster formation, capacity building, incentive for inputs, value addition and marketing.
- The broad components of the scheme are
 - (i) implementation, handholding, capacity building and certification
 - (ii) Participatory Guarantee System Certification
 - (iii) Incentive to farmers

(iv) Value addition, marketing and publicity.

2. Bhartiya Prakritik Krishi Paddhati Programme (BPKP):

- BPKP is a **sub-mission under the PKVY** which aims at **promoting traditional indigenous practices**, which give freedom to farmers from externally purchased inputs.
- It focuses on **on-farm biomass recycling** with major stress on biomass mulching; use of cow dung-urine formulation and exclusion of all synthetic chemical inputs either directly or indirectly.

3. Mission Organic Value Chain Development for North Eastern Region (MOVCDNER):

- The Ministry of Agriculture and Farmers Welfare has launched the “Mission Organic Value Chain Development for North Eastern Region” for implementation in the **states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura.**
- The scheme aims at **development of certified organic production in a value chain mode** to link growers with consumers and to **support the development of entire value chain** starting from inputs, seeds, certification, to the creation of facilities for collection, aggregation, processing marketing and brand building initiative.

Conclusion

- Organic farming is a solution to nurture the land and regenerate the soil by going back to our traditional farming method, i.e., free from chemicals, pesticides, synthetic materials, growth hormones, and fertilizers, which is a great step towards sustainable development.

10) We need a forest-led COP27

(GS3: Conservation, Environmental Pollution and Degradation, Environmental Impact Assessment)

Context

- In September, a study published in the journal Science said **earth may have already passed through five dangerous tipping points due to the 1.1°C of global heating** caused by humanity to date.
- Calls for developing and transferring technologies to support action on climate change have become louder worldwide.
- Technology has become a survival strategy for our species. However, technology alone is unprepared to deal with the challenge, which requires a **societal overhaul and a zero emission strategy.**

Technological Optimism

- The 26th session of the Conference of the Parties (COP 26) to the UNFCCC held at Glasgow also fuelled technological optimism. There was an observation that every technological solution discussed at COP26 depends on just three resources: **nelectricity** (non-emitting electricity generated by hydropower, renewables or nuclear fission), **carbon capture and storage (CCS)** or **biomass.**
- The **total demand for those resources** required by the plans discussed at COP26 **cannot be met by 2050.**
- Tech-centric mitigation conversations **leave forest economies and subjects such as conservation and forests**, which are the best carbon removal instruments, **to the ideological fringes of climate conversation.**
- Climate action requires the **same amount of investment in conservation** as we see in new technology transfers.

Multi-Pronged, Interconnected Climate Solutions

- While there was the **deforestation-ending climate commitment** at COP26, the nature of the pledge was vague. Countries may easily attempt to achieve their 'net zero deforestation goals' through **monoculture farming**.
- But this **won't be of much help**: scientists have stated that **naturally preserved forests are 40% more effective than planted ones**.
- Our **climate crisis is intertwined with other complex issues**. This means that we must insist on **multi-pronged, interconnected climate solutions**.
- **Forests, which are home to 80% of terrestrial wildlife, are at this intersection**. Forests absorb a net **7.6 billion metric tonnes of CO2 a year**. A new study has found that their biophysical aspects have a tendency to **cool the earth by an additional 0.5%**.
- The conservation of forests, along with other nature-based solutions, can provide up to **37% of the emissions reductions** needed to tackle climate change.
- **Green infrastructure** (salt marshes and mangroves) are **2-5 times cheaper than grey infrastructure** (breakwaters).

Conserving Natural Sinks

- The Intergovernmental Panel on Climate Change (IPCC) estimates that **land serves as a large CO2 sink**.
- There is a growing body of evidence that a large proportion of the required CO2 removals could be achieved by **conserving natural sinks, improving biodiversity protection, and restoring ecosystems**.

- Preserving earth's cyclical processes by protecting terrestrial ecosystems and natural sinks and transformative agricultural practices under the leadership of indigenous people and local communities is a **far more equitable and cost-effective way of tackling the climate crisis** than it is being done now.

Way Forward

- We need to realise that the climate crisis is just a symptom; our real problem is that human consumption and activity have exceeded the regenerative capacity of our planet.
- Technology, at best, can assist us, not lead us, on the pathway to a sustainable, regenerative and equitable world.

11) Cultivated Idea

(GS3: Conservation, Environmental Pollution and Degradation, Environmental Impact Assessment)

Context

- The potential of **Urban farming** in alleviating food insecurity from cities requires holistic policy support from governments.

Urban Farming

- Urban farming or urban agriculture refers to the **practice of growing plants and raising animals for human consumption within cities and suburbs**.
- According to the **UN Food and Agriculture Organization**, Urban farming contributes to **food security, livelihood generation, poverty alleviation and increased resilience of cities to climate change**.

Methods of Urban Farming

- **Vertical farming** refers to growing crops in vertically stacked layers to save space. They are in controlled, indoor environments where

horticulturalists can maintain the ideal temperature, light, water, and nutrients.

- **Hydroponics** is a method of growing plants without soil, in a water based nutrient solution. It allows for faster growth and higher yields than traditional soil-based growing systems.
- **Aquaponics** is a combination of both Aquaculture and Hydroponics. Here, fish waste provides organic food for plants and plants naturally filter the water, which is used to replenish the fish tank.
- **Aeroponics** is a method of growing plants without soil, where roots are suspended in air and irrigated with a nutrient-dense mist.
- **Container farming** is the process of growing plants in shipping containers instead of planting them in the ground. This type of gardening allows for easier monitoring of moisture, temperature, and sunlight.
- **Rooftop Gardening** is essentially cultivating food on the rooftop of a building, residential complex, commercial spaces, etc.

Advantages of Urban Farming

- **Nutritional and Quality Food:** Fruits and vegetables are a rich source of Vitamins and minerals. The time lapse in their transport, storage, packing and processing is almost nil in urban farming, thus providing fresh and quality produce at door steps. As the produce is **less processed** (cleaning, blanching, freezing and cold storage) the **chance of loss of vitamins and minerals is least and the produce is rich in its nutritional values.**
- **Environmental Justice:** Practicing urban farming has several environmental benefits like, **reduction in plastic pollution** due

to recycling and reuse of waste plastic containers, **reduction in air pollution and reduction in water pollution** etc.

- **Economic Benefits:** Urban agriculture provides employment and incomes for poor women and other disadvantaged groups. The poor and disadvantaged can be allotted waste government lands to practice farming and earn their daily wages.

State Models

- In 2012, **Kerala** launched a '**Vegetable Development Program**' (VDP) to encourage gardening in houses, schools, government and private institutions. It also offered subsidies and support for eco-friendly inputs, irrigation, compost and biogas plants. According to Kerala State Planning Board, vegetable production in the state rose from 825,000 tons in 2011-12 to 1.3 million tons in 2014-15.
- In 2014, **Tamil Nadu** government introduced a "**Do-it-yourself**" kit for city dwellers to grow vegetables on rooftops, houses and apartment buildings under its Urban Horticulture Development Scheme.

Challenges to Urban Farming

- The main challenges faced by urban farms are **higher production costs, difficulty in managing pests and weeds and changing climatic scenario.**
- Studies show that **excessive use of chemical fertilizers and pesticides** in urban farms can **lower produce and affect soil quality.**
- There are also **food safety concerns** regarding the **use of wastewater and organic material** in urban agriculture.

- There also exists the **threat of spread of diseases and lowered yields.**

Way Forward

- Public institutions and workspaces could be encouraged to create green corners in their premises by growing their own food.
- There is a need to **incorporate urban agriculture into urban land use planning** for achieving food security.

12) Zoonoses Crucibles

(GS3: Science and Technology- Developments and their Applications and Effects in Everyday Life)

Context

- Livestock diseases have an enormous impact not only on animal health and economy, but also on human health. Further, Livestock house pathogens that can become zoonoses and hence timely detection is necessary to curb outbreaks.

Zoonoses

- According to **WHO**, zoonoses are **diseases and infections which are naturally transmitted between vertebrate animals and man.**
- They may be **bacterial, viral, or parasitic, or may involve unconventional agents** for the transmission of diseases.

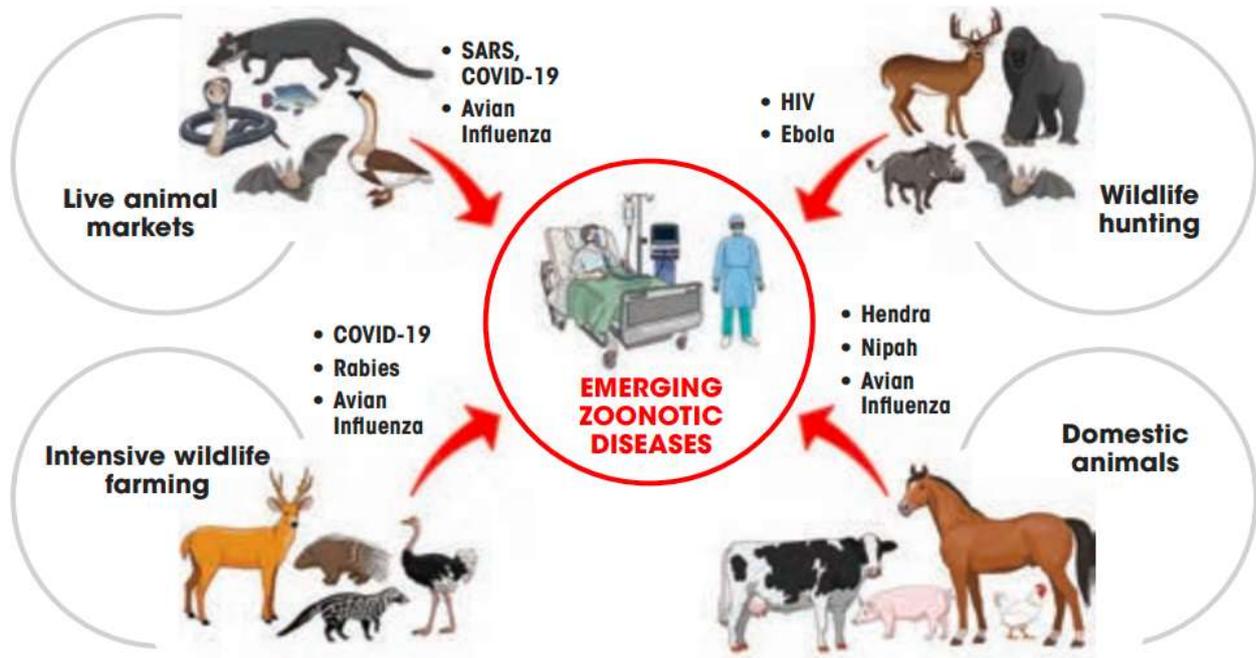
Causes of Zoonotic Diseases

- **Deforestation, Habitat loss and Fragmentation** has increased the contact between humans and wild animals.
- Zoonoses can occur due to **direct contact with body fluids such as blood, saliva of an infected animal.**
- It can also spread due to **consumption of contaminated food.**
- **Overuse of anti-microbials and climate change** are other causative factors.

Recent Findings

- A recent UN report has revealed that in the last 170 years, **nine epidemics among livestock have spilled over to people.**
- Frequent outbreaks in recent decades are due to **intensification of agriculture.**
- **Nearly 77 per cent of livestock pathogens are capable of infecting multiple host species, including wildlife and humans.**
- Most of the increase in human and livestock densities are expected to occur in developing countries where disease surveillance, pest control, sanitation, and medical and veterinary care are limited.

Emergence of various Zoonotic diseases at Animal Human Interface



Indian Scenario

- **India suffers from the highest zoonotic disease burden** along with Ethiopia, Nigeria and Tanzania.
- In India, **out of the 13 livestock diseases** monitored by the National Institute of Veterinary Epidemiology and Disease Informatics (NIVEDI), **four are zoonotic**, namely, **anthrax, babesiosis, fasciolosis and trypanosomiasis**.
- To prevent potential disease outbreaks, NIVEDI issues forewarning every month to help stakeholders take preventive measures in time.
 - *NIVEDI has been set up under the regulations of the Indian Council of Agricultural Research (ICAR) to fulfill the needs of surveillance and monitoring of livestock diseases and thereby caring for the country's animal health.*

National Digital Livestock Mission

- It is an initiative of the **Ministry of Agriculture and Farmers' Welfare**, with the objective of

ensuring sustainable development of the livestock sector.

- It aims to **tag all major livestock in the country with a unique 12-digit identification (ID) number**.
- Details like age, breed, milk yield, vaccinations and dates of artificial insemination and delivery of calves are recorded in a central database.
- **Disease modelling and surveillance** for prevention and control of livestock diseases are done through mobile veterinary units, connected with **toll free helpline number, 1962**.

Other Initiatives

- **Rashtriya Gokul Mission** was launched for the **development and conservation of indigenous breeds** through selective breeding in the bovine population.
- The **National Animal Disease Control Programme** has been launched to **control Foot & Mouth Disease and Brucellosis**.
- **Livestock Health & Disease Control (LH&DC) Scheme** aims to reduce risk to animal health by vaccination against diseases of animals, capacity building of

Veterinary services, disease surveillance and strengthening veterinary infrastructure.

Way Forward

- An effective response to emerging zoonotic diseases relies heavily on **efficient surveillance and reporting systems**.
- **Cross-sectoral collaboration** is key to understanding and managing public health risks at the human-animal-environment interface and to improve national health security.
- The **establishment of effective laboratory systems** is critical for surveillance of zoonotic diseases.

13) Strides in Sanitation

(GS2: Issues Relating to Development and Management of Social Sector/Services relating to Health, Education, Human Resources)

Context

- As we celebrate the 75th anniversary of India's independence, much can be said about the progress the country has made in achieving the Sustainable Development Goals (SDG) concerning sanitation.

Sanitation status before 2014 and its Impact

- Till 2014, sanitation coverage in India was as low as 39 per cent.
- Around 55 crore people in rural areas were without a toilet facility before 2014.

Impact on Health

- Exposure to contaminated drinking water and food with pathogen-laden human waste is a major cause of **diarrhoea** and can cause **cholera, trachoma, intestinal worms**, etc, leading to the **"stunting" of children**.

Impact on Environment

- Poor hygiene and waste management practices also impact

the environment with **untreated sewage flowing directly into water bodies** and **affecting coastal and marine ecosystems, contaminating soil and air, and exposing millions to disease**.

Impact on Economy

- A study by the World Bank states that the absence of toilets and conventional sanitation **costs India 6.4 per cent of its GDP in 2006**.
- The economic impact of poor sanitation for India is at least **\$38.5 billion every year**.

Sanitation status post 2014

- From 2014 to 2020, more than 10 crore toilets were constructed. **The country declared itself "open-defecation free" (ODF) on October 2, 2019.**

How does that happen?

Launch of Swachh Bharat Mission

- The launch of the Swachh Bharat Mission (SBM) by Government of India on October 2, 2014, had a unique goal to **achieve universal sanitation coverage** and to make the country **Open Defecation Free (ODF)**.
- It offered **financial incentives** for building household toilets, as well as community toilets for slums and migrant populations.
- It ensured **participation of the private sector and NGOs to educate** the population on the benefits of ODF to bring about a **behavioural change** among them.

SBM 2.0

- The second phase of the project, which commenced in 2020 and is expected to run till 2025 has the following targets
 - **sustaining the achievements** of phase 1 and
 - ensuring that **treatment of both liquid and solid waste** is achieved through

the help of **technology and private sector engagement.**

Lighthouse Initiative

- The Lighthouse Initiative (LHI) was started by the **Ministry of Drinking Water and Sanitation** to effectively **implement solid and liquid waste management structures.**
- It aims at employing a **participatory and consultative approach** through mobilisation of the village communities, corporates, district and block administration and gram panchayat officers.
- It is to be implemented through Public Private Partnership (PPP) Model across villages in 75 gram panchayats in 15 states in Phase 1.
- LHI is based on the principle of **inclusive sanitation and leaving no one behind.**

Benefits of LHI

- **Creates hygienic surroundings** for the communities;
- Helps the communities to become **economically self-sufficient** in the medium to long term;
- Recovery of precious grey water through minimal treatment and treatment of sewage helps tackle scarce water resources, encouraging reuse and conserving water bodies;
- Help **build the capacity of the gram panchayats** in understanding how to manage the various programmes where PPPs can excel.

Indian Sanitation Coalition

- In addition to the above mentioned initiatives, the India Sanitation Coalition played a major role in bringing together all actors in the sanitation space to drive sustainable sanitation through a partnership mode.

- It is a **multi-stakeholder platform** that creates meaningful collaborations among private sector, government, financial institutions, civil society groups, media, donors, etc.
- ISC is recognised as the **official intersection between the government and the private sector** for engagement in helping build solid and liquid waste management infrastructure sustainably.

Conclusion

- These successful initiatives hold the promise of taking forward the remarkable success of the first phase of SBM.

14) Untapped Potential of Food Processing Industry

(GS3: Food Processing and Related Industries in India- Scope' and Significance, Location, Upstream and Downstream Requirements, Supply Chain Management)

Context

- India being among the world's top producers of many key farm commodities, the scope for the value-addition of surplus agricultural output is immense.
 - The country ranks first in the production of **milk**; second in that of **fruit, vegetables and fisheries**; and third in **eggs**.
 - It also produces a **variety of health foods and therapeutically important herbs** which can be processed into nutritious snacks and other kinds of high-value products for domestic and export markets.
- A higher level of processing would also generate **additional income**

for farmers and off-farm employment and entrepreneurship opportunities for rural people.

Status of Food Processing Industry

- The **gross value added (GVA)** of the food-processing sector has surged from Rs 1.34 trillion in 2014-15 to **Rs 2.37 trillion in 2020-21**.
- A recent study report released by the Federation of Indian Chambers of Commerce and Industry indicates that the food processing sector may grow at an even faster pace of around 15 per cent a year from now on.

Reasons for the success of Food Processing Sector

- A **favourable policy environment** has played a major role in the rapid expansion of this sector.
- The government has allowed **100 per cent foreign direct investment under the automatic route** for manufacturing and retail trading, including e-commerce, of food products made in India.
- The government has extended the **Production-Linked Incentive Scheme** to the food processing industry to impart further impetus to its growth.
- Notable government initiatives targeted specifically at promoting small-scale or cottage-level food processing for the benefit of producers.
- For instance: **Pradhan Mantri Kisan SAMPADA Yojana** aims primarily at creating modern post-harvest infrastructure for value-addition in farm products and their down-the-line value-chain.
- **PM-Formalisation of Micro Food Processing Enterprises Scheme** provides financial, technical, and business support for setting up small-scale ventures and the

upgrade of the existing micro food-processing units on the basis of the one-district-one-product approach.

Issues surrounding Food Processing Industry

- Despite impressive growth over the past few years, the food processing industry has failed to effectively serve its prime objectives of:
 - **Bolstering farmers' incomes**
 - Gains from the value-addition of agricultural products are accruing largely to the industry rather than the farmers;
 - **Curtailing wastage of farm produce.**
 - Post-harvest losses of farm output continue to be rather **high up to 40 per cent** in some perishable items which is equivalent to Rs 60,000-80,000 crore annually in monetary terms.

Reasons for not serving the sector's prime objectives

- **Incompetent post-harvest handling, transportation, storage, and marketing** of the produce;
- A **low level of on-farm processing** to enhance the value and extend the shelf-life of the harvested stuff;
- **Lack of direct linkage** between growers and processors.

Way Forward

- **Promote small-scale and village-level agro-processing units** even while continuing to support the organised sector food-processing industry.
- **Preferential treatment** should be given to the small- and medium-

scale sectors as they directly impact farm incomes.

- **Encourage farmers to set up mini or micro agro-processing centres**, individually or collectively, through cooperatives or farmers' producer organisations.
- At least **25 percent of the farm harvest** should be subjected to some kind of **value-enhancing treatment or processing** to reduce spoilage, facilitate the year-round availability of seasonal agricultural products, and soften volatility in their prices.

15) A leg-up for logistics

(GS3: Infrastructure: Energy, Ports, Roads, Airports, Railways etc)

Context

- India's logistics costs add up to around 13 per cent of gross domestic product which is significantly higher than developed countries like China, US and Europe, where the global average is somewhere around 8 percent. It shows that there's lots of room for improvement.

Challenges and Opportunities

- Logistics in India is **highly fragmented. Organised players account for only 3.5 percent** of the logistics market. However, they are expected to grow much faster at a compounded rate of more than 35 percent over the next few years.
- The high cost of logistics in India can lead to **inflationary pressures for consumers**.
- It can also **make exports uncompetitive and dampen investor confidence** in the economy, reducing domestic and foreign investment.

Government Initiatives to Improve Logistics Sector

- **Greenfield Expressways** - Greenfield Expressways are designed to avoid inhabited areas and go through new alignments to bring development to new areas and to reduce land acquisition costs and construction timelines. Eg: Delhi-Mumbai Expressway.
- **Dedicated Freight Corridors** - It is a high speed and high capacity railway corridor that is exclusively meant for the transportation of goods and commodities.
- The **Goods & Services Tax** harmonised and unified tax rates across the country and removed ambiguous state levies.
- The Government has also launched the "**PM GatiShakti — National Master Plan**" for infrastructure development aimed at boosting multimodal connectivity and driving down logistics costs. It is a digital platform that connects 16 ministries — including Roads and Highways, Railways, Shipping, Petroleum and Gas, Power, Telecom, Shipping, and Aviation—with a view to ensuring holistic planning and execution of infrastructure projects.

National Logistics Policy 2022

- The government has recently released the National Logistics Policy 2022 as a comprehensive effort to **address issues of high cost and inefficiency** by laying down an overarching interdisciplinary, cross-sectoral and multi-jurisdictional framework for the development of the entire logistics ecosystem.
- NLP targets to **bring the logistics cost down to 8 per cent by 2030**.
- The NLP expects this reduction through the implementation of a **five-pronged strategy**.

- **Pushing up the share of railways** from the current 28 per cent to **40 per cent**.
- Setting up **multi-modal logistics parks** by encouraging private investment in hotspots identified on the GatiShakti platform.
- Giving **special emphasis to inland water transportation, coastal shipping**, and moving liquid bulk cargo via **pipelines**.
- **Specific plans** are to be drawn up for 15 industries that constitute the majority of bulk cargo movement.
- **Digital integration** is to be achieved for tracking and monitoring.

Conclusion

- All this is expected to put India amongst the top 25 nations in terms of logistics efficiency by 2030, which can then surely lead to the aspiration of being amongst the top 10 by 2047, when India turns 100.

16) The criterion for SC status

(GS1: Social Empowerment, Communalism, Regionalism & Secularism)

Context

- The Supreme Court of India has sought the position of the Union government on a batch of petitions challenging the **Constitution (Scheduled Castes) Order of 1950**, which allows **only members of Hindu, Sikh and Buddhist religions to be recognised as SCs**.

Who all are included in the Constitution Order of 1950?

- When enacted, the Constitution (Scheduled Castes) Order of 1950, initially provided for **recognising**

only Hindus as SCs, to address the social disability arising out of the practice of untouchability.

- The Order was **amended in 1956** to include Dalits who had converted to **Sikhism** and once more in **1990** to include Dalits who had converted to **Buddhism**. Both amendments were aided by the reports of the **Kaka Kalelkar Commission** in 1955 and the **High Powered Panel (HPP) on Minorities, Scheduled Castes and Scheduled Tribes** in 1983 respectively.
- On the other hand, the Union government in 2019 **rejected the possibility of including Dalit Christians as members of SCs**, rooting the exclusion on an Imperial Order of 1936 of the then colonial government, which had first classified a list of the Depressed Classes and specifically excluded “Indian Christians” from it.

Why are Dalit Christians excluded?

- Ever since the amendment to include Sikhs as SCs in 1956, the Office of the Registrar General of India (RGI) has been reluctant in expanding the ambit of the Order beyond members of Hinduism or Sikhism.
- Responding to the Ministry of Home Affairs’s (MHA) 1978 request for an opinion on the inclusion of Dalit Buddhists and Christians, the RGI had cautioned the government that **SC status is meant for communities suffering from social disabilities arising out of the practice of untouchability**, which it noted was **prevalent in Hindu and Sikh communities**. It also noted that such a move would **significantly swell the population of SCs across the country**.

- However, the amendment to include Buddhist converts as SCs was passed in 1990, which at the time **did not require the approval of the RGI — a mandate introduced in the rules for inclusion framed in 1999.**
- In 2001, when the RGI again opined against including Dalit Christians and Muslims as SCs, it referred to its 1978 note and added that like Dalit Buddhists, **Dalits who converted to Islam or Christianity belonged to different sets of caste groups and not just one, as a result of which they cannot be categorised as a “single ethnic group”,** which is required by Clause (2) of Article 341 for inclusion.
- Moreover, the RGI opined that since the practice of “untouchability” was a feature of Hindu religion and its branches, allowing the inclusion of Dalit Muslims and Dalit Christians as SCs could result in being **misunderstood internationally as India trying to impose its caste system upon Christians and Muslims.**
- The 2001 note also stated that Christians and Muslims of Dalit origin had **lost their caste identity** by way of their conversion and that in their new religious community, the practice of untouchability is not prevalent.
- This was substantiated in the First Backward Classes Commission’s report in 1953, the Report of the Committee on Untouchability Economic and Educational Development Of the Scheduled Castes in 1969, the HPP report on SCs, STs, and Minorities in 1983, the Mandal Commission Report, the report of the Prime Minister’s High-Level Committee formed in 2006, a 2008 study conducted by the National Commission for Minorities, the Ranganath Misra Commission Report and several other studies.
- In addition to this, the petitions have argued against the proposition that caste identity is lost upon conversion, noting that **even in Sikhism and Buddhism, casteism is not present and yet they have been included as SCs.** Furthermore, the above-mentioned reports argue that **caste-based discrimination continues even after conversion,** hence entitling these communities to SC status.
- However, the Union government refuses to accept the reports of the Commissions on the basis that these reports **do not have enough empirical evidence to support their claims.**

Is there a case for inclusion?

- The petitions arguing for inclusion have cited **several independent Commission reports** that have **documented the existence of caste and caste inequalities among Indian Christians and Indian Muslims,** noting that even after conversion, members who were originally from SCs continued to experience the same social disabilities.

17) The Uniform Civil Code

(GS1: Social Empowerment, Communalism, Regionalism & Secularism)

Context

- Several political leaders have called for implementing Uniform Civil Code (UCC) in the country.

Constitutional Provisions

- **Article 44** contained in **part IV of the Constitution** says that the state “shall endeavour to secure for the citizens a uniform civil code throughout the territory of India”.

- While there is no draft or model document yet for the UCC, the framers of the Constitution envisioned that it would be a **uniform set of laws that would replace the distinct personal laws of each religion with regard to matters like marriage, divorce, adoption, and inheritance.**
- **Part IV** of the Constitution outlines the **Directive Principles of State Policy**, which, **while not enforceable or justiciable in a court of law, are fundamental to the country's governance.**

Constituent Assembly Debates

- The clause on UCC generated substantial debate in the Constituent Assembly about whether it should be included as a fundamental right or a directive principle. The matter had to be settled by vote; with a majority of 5:4, wherein the sub-committee on fundamental rights headed by Sardar Vallabhbhai Patel decided that **securing a UCC was not within the scope of fundamental rights.**
- Members of the Assembly took starkly contrasting stances on the UCC. Some also felt that **India was too diverse a country for the UCC.**
- Member Naziruddin Ahmad from Bengal argued that **UCC would come in the way of Article 19 of the draft Constitution (now Article 25)** which guarantees the right to freedom of religion subject to public order, morality, and health. While he was not against the idea of a uniform civil law, he argued that the **time for that had not yet come**, adding that the process had to be gradual and not without the consent of the concerned communities.
- Member K.M. Munshi however, **rejected the notion that a UCC would be against the freedom of religion** as the Constitution allowed the government to make laws covering secular activities related to religious practices if they were intended for social reform.
- He advocated for the UCC, stating **benefits such as promoting the unity of the nation and equality for women.** He said that if personal laws of inheritance, succession and so on were seen as a part of religion, then many discriminatory practices of the Hindu personal law against women could not be eliminated.
- **Dr. B.R. Ambedkar** had more of an ambivalent stance toward the UCC. He felt that while desirable, the UCC should remain **“purely voluntary”** in the initial stages. He stated that the Article merely proposed that the state shall endeavour to secure a UCC, which means it **would not impose it on all citizens.** The amendments to protect personal laws from the UCC were eventually rejected.

What are the various arguments around the UCC?

- It has been argued that while **India does have uniformity in most criminal and civil matters** like the Criminal Procedure Code, Civil Procedure Code, and the Contract Act, **States have made over 100 amendments** to the CrPC and IPC, as well as several amendments to civil laws.
- For instance, many States reduced the fines prescribed and justified by the Centre under the amended Motor Vehicles Act. Another example could be that the law of anticipatory bail differs from one State to another.

- Experts thus argue that if there is **plurality in already codified civil and criminal laws**, how can the concept of **'one nation, one law'** be applied to diverse personal laws of various communities?
- Besides, constitutional law experts argue that perhaps the **framers did not intend total uniformity**, which is why personal laws were placed in **entry 5 of the Concurrent List**, with the power to legislate being given to Parliament and State Assemblies.

Other Issues

- Looking at the codified personal laws of various communities in India — **all Hindus are not governed by a homogenous personal law** even after the enactment of the Hindu Code Bill, **neither are Muslims and Christians under their personal laws**.
- For instance: while marriages amongst close relatives are prohibited by the Hindu Marriage Act of 1955, they are considered auspicious in the south of India. Even the Hindu Succession Act of 1956 made several compromises and could not make the daughter a coparcener till 2005.
- Wives are still not coparceners nor do they have an equal share in inheritance. Similarly, there is still no uniform applicability when it comes to the Muslim personal law or the Shariat Act that was passed in 1937.
- For example, the Shariat Act is **not applicable in Jammu and Kashmir** and Muslims continue to be governed by **customary law** which is at variance with the Muslim personal law in the rest of the country. The applicability also varies for certain sects of Muslims.

- Besides, many **tribal groups** in the country, regardless of their religion, follow their own **customary laws**.

Example of Goa

- While the Supreme Court in 2019 hailed **Goa** as a “shining example” of an Indian State which has a **functioning UCC**, experts point out that the ground reality in Goa is **more complex** and that the Code has **legal pluralities**.
- The Goa Civil Code was given by the **Portuguese** in 1867; it permits a certain form of polygamy for Hindus while the Shariat Act for Muslims has not been extended to Goa with Muslims of the State being governed by Portuguese law as well as Shastric Hindu law.
- The Code gives certain concessions to Catholics as well. Catholics need not register their marriages and Catholic priests can dissolve marriages performed in church.

What has the Supreme Court said about the UCC?

- The Supreme Court in various judgements has **called for the implementation of the UCC**. In its **Mohd. Ahmed Khan vs Shah Bano Begum judgement of 1985**, where a divorced Muslim woman demanded maintenance from her former husband, the apex court while deciding whether to give prevalence to the CrPc or the Muslim personal law, called for the implementation of the UCC.
- The Court also called on the government to implement the UCC in the **1995 Sarla Mudgal judgement** as well as in the **Paulo Coutinho vs Maria Luiza Valentina Pereira case (2019)**.

Recommendations of Law Commission

- In 2018, the Law Commission submitted a 185-page consultation paper on the reform of family law.

The paper stated that a **unified nation did not necessarily need “uniformity”**.

- While saying that a UCC is **neither necessary nor desirable at this stage**, the report recommended that **discriminatory practices, prejudices and stereotypes within a particular religion and its personal laws should be studied and amended**.
- The Commission suggested certain measures in marriage and divorce that should be uniformly accepted in the personal laws of all religions. Some of these amendments include **fixing the marriageable age for boys and girls at 18 years** so that they are married as equals, **making adultery a ground for divorce for men and women** and **simplifying the divorce procedure**.

18) Perfect Storm

(GS1: Important Geophysical Phenomena)

Context

- The world is seeing a rise in cyclonic formations and in recent years, several storms have come close to undergoing the Fujiwhara effect.

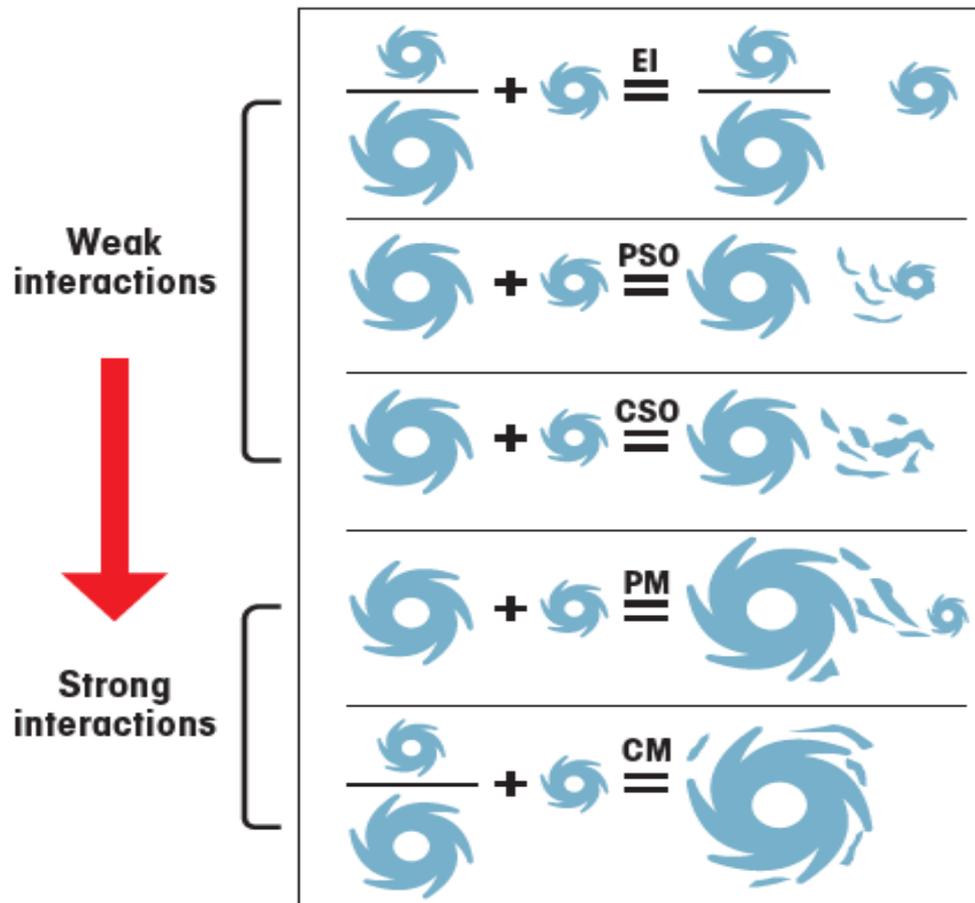
Fujiwhara effect

- The Fujiwhara Effect was first described by a Japanese meteorologist, Dr. Sakuhei Fujiwhara in 1921.
- It is a phenomenon that occurs **when two nearby cyclonic vortices move around each other and close the distance between the circulations of their corresponding low-pressure areas**.
- When the two vortices are of **unequal size**, the larger vortex will tend to dominate the interaction, and the smaller vortex will circle around it.



Mechanism

- There are five different ways in which the Fujiwhara effect can take place. Refer to the image provided below.



- **Elastic Interaction (EI):** Interaction of vortices (storms) of same or different sizes, resulting in changes only in the direction of motion. This is the most commonly seen interaction.
- **Partial Straining-Out (PSO):** Interaction of vortices of unequal sizes. Part of the smaller vortex is lost to the atmosphere.
- **Complete Straining-Out (CSO):** Interaction of vortices of unequal sizes. The smaller vortex completely lost to the atmosphere.
- **Partial Merger (PM):** Interaction of vortices of unequal sizes. Part of the smaller vortex merged into the bigger vortex.
- **Complete Merger (CM):** Interaction of vortices of same or different sizes, resulting in complete merger of both the storms.

Is the frequency of the Fujiwhara effect increasing?

- **Warmer oceans and stronger cyclones drastically increase the possibility of the Fujiwhara effect.**
- For instance: There has been a 35 per cent increase in the strength of typhoons that have hit Taiwan between 1977 and 2016, due to 0.4 to 0.7°C rise in the sea surface temperature.
- This shows how global warming is responsible for making cyclones stronger, and thus increasing the chances of the Fujiwhara effect.

Way Forward

- Current climate models being used for tracking tropical cyclones around the world should take the Fujiwhara effect into account. This will help scientists to know if a mega storm is gathering momentum.

19) Refugee migrant population at AMR Risk

(GS3: Awareness in the fields of IT, Space, Computers, Robotics, Nano-technology, Bio-technology and issues relating to Intellectual Property Rights)

Context

- The World Health Organization (WHO) in the fourth report of its global review on health and migration, revealed that migrant populations are becoming particularly vulnerable to Antimicrobial Resistance (AMR).

Anti-microbial Resistance

- Antimicrobial resistance, also known as drug resistance, is the **resistance acquired by microorganisms such as bacteria, viruses, fungi and parasites against antimicrobial drugs** that are used to treat infections, making infections harder to treat and increasing the risk of disease spread, severe illness and death.
- When the microorganisms become resistant to most antimicrobials they are often referred to as “**superbugs**”.
- According to WHO, AMR is responsible for 1.27 million deaths in a year.
- WHO has declared that AMR is **one of the top 10 global public health threats facing humanity**.

Causes of AMR

- **Genetic mutations** endow microbes with genes that enable them to resist anti-microbial agents.
- **Access to antibiotics without prescription, improper administration and overconsumption** can cause AMR in humans.
- Antibiotics are commonly used for **growth promotion in poultry**. Here, drug-resistant bacteria found

in meat have exposure to contaminated water and in this way, **diseases that affect animals can pass to humans**.

- **Untreated disposal of sewage of waterbodies** can lead to contamination of rivers with antimicrobial residues.

Impact of AMR

- AMR **increases the health burden** of nations leading to higher medical costs, **prolonged hospital stays, and increased mortality**.
- Organ transplantations, chemotherapy, diabetes management and surgeries become **more dangerous** without effective antibiotics for treatment of infections.
- The economic impact of increasing AMR includes **loss of a productive workforce, leading to lowered national outputs**.
- It also **endangers the achievement of Sustainable development goals (SDGs)**.

Findings of the Report

- The latest WHO report states that **refugees and migrant population**, accounting for 3.5 per cent of the global population in 2020, **face greater threat from drug resistant bacteria**.
- The conditions under which refugees and migrants leave their countries of origin and transit to their destination countries may lead to increased infections.
- WHO analysis also shows that refugees suffer from poor access to healthcare in the host countries. Limited capacity of health services, high costs, inappropriate prescription of antibiotics and language or cultural barriers have prompted many to resort to unsafe means to meet healthcare needs.

Global Efforts to combat AMR

- **World Antimicrobial Awareness Week** (18 to 24 November) held annually is a global campaign that aims to increase awareness of antimicrobial resistance worldwide and to encourage best practices among the public, health workers and policy makers to avoid the further emergence and spread of drug-resistant infections.
- **The Global Antimicrobial Resistance Surveillance System (GLASS)** under the WHO supports a standardized approach to collection, analysis and sharing of data related to antimicrobial resistance at a global level to promote informed decision-making.
- The **AWaRe tool** was developed by the **WHO** to guide policy-makers and health workers to use antibiotics safely and more effectively. The AWaRe tool classifies antibiotics into:
 - **Access**— antibiotics used to treat the most common and serious infection,
 - **Watch**— antibiotics available at all times in the healthcare system,
 - **Reserve**— antibiotics to be used, sparingly and used only as a last resort.

National Initiatives

NAP-AMR

- The Government of India adopted the **National Action Plan on AMR (NAP-AMR)** in 2017, with the Ministry of Health and Family Welfare (MoHFW) as the nodal ministry. The overarching goal of NAP-AMR is to effectively combat antimicrobial resistance in India, and contribute towards the global efforts to tackle this public health threat.

Red Line Campaign

- The **Union Ministry of Health and Family Welfare** has made it mandatory to display a 5mm-thick red vertical band (line) on packaging of prescription-only drugs (which compulsorily require Doctors' Prescription).
- It aims at sensitising people and making them cautious while buying these Antibiotic medicines that are widely sold without prescriptions.

Antimicrobial Resistance Surveillance and Research Network (AMRSN)

- Initiated by the Indian Council of Medical Research (ICMR) in 2013, AMRSN aims to generate evidence and capture trends and patterns of drug resistant infections in the country.

Way Forward

- There is a need to promote a **One Health approach** through multi-sectoral participation. One Health is an approach that recognizes that human health is closely connected to the health of animals and the shared environment.
- Promoting research to address the data deficiency around AMR will provide for informed policy actions to mitigate AMR.

20) Mission Karmayogi: Reimagining the civil servant

(GS2: Role of Civil Services in a Democracy)

Context

- The civil services have remained at the epicentre of all government activities in India, both as agents of policymaking as well as the executive hand that delivers and implements those policies.
- This is the appropriate time for the civil services to pause, reflect and strategise on the approaches needed to shape its future.

Mission Karmayogi

- Mission Karmayogi is a nationwide programme to lay the foundation for **capacity building of civil servants**. It will help the officers to learn about the best practices across the world.
- Officially called the "**National Programme for Civil Services Capacity Building**", the mission plans to **transform human resource management in the country**.
- The fundamental focus of the reform is the creation of a '**citizen centric civil service**' capable of creating and delivering services conducive to economic growth and public welfare.
- Mission Karmayogi has the following **six pillars**:- Policy Framework, Institutional Framework, Competency Framework, Digital Learning Framework (Integrated Government Online Training Karmayogi Platform (iGOT-Karmayogi), electronic Human Resource Management System (e-HRMS), and Monitoring and Evaluation Framework.

Institutional Framework

- The institutional framework includes four institutions
- 1. The Prime Minister's Human Resource Council**
 - NPCSCB will be governed by the Prime Minister's Human Resource Council, which also includes state Chief Ministers, Union Cabinet ministers and experts. This council approves and reviews civil service capacity building programmes.
 - 2. The Cabinet Secretariat coordination unit**
 - Cabinet Secretary Coordination Unit comprises select secretaries and cadre controlling authorities.

3. The Capacity Building Commission (CBC)

- Build credibility and shape a uniform approach to capacity building on a collaborative basis.
- It will determine the roll-out strategy of the NPCSCB, onboarding different ministries and departments.

4. The SPV Karmayogi Bharat: It governs the iGOT-Karmayogi platform. .

Need for Mission Karmayogi

- Civil servants are the **agents of policy making and its implementation**;
- **People centric governance** is becoming a national imperative;
- Rise of **information and communication technology** and **better informed citizenry**;
- For the Indian state to become a **partnership state** from being a provider and a provisioner state. Eg: Government, private sector, civil society and citizen volunteer groups joined efforts against COVID-19 pandemic;
- Need for a **new mindset and an evolving skill set** to deal with a dynamic ecosystem including skills of collaboration, adaptiveness, credit sharing, persuasion, and conflict resolution along with understanding of disruptive innovations, digital arenas, big data management and emerging technologies.

Conclusion

- As India is moving towards a "**less government, more governance**" **approach** that requires a paradigmatic shift in the capacities, mindset and actions of the civil servant, Mission Karmayogi is a step in the right direction.

21) Indian Deep Tech

(GS3: Awareness in the fields of IT, Space, Computers, Robotics, Nano-technology, Bio-technology and issues relating to Intellectual Property Rights)

Context

- In order to become a developed country in 25 years, India will need to build **world-class deep tech capabilities** in certain sectors. This can be achieved by promoting deep-tech start-ups in the country.
 - *Deep tech can be described as innovations that have the potential to push technological boundaries beyond what is considered possible right now. This encompasses areas of fundamental sciences such as physics and chemistry but also touches such scientific and technological fields as robotics, AI and machine learning, biotechnology, health and longevity, and IoT.*

Scenario in India

- India had over 3,000 deep-tech start-ups, dabbling in new-age technologies like Artificial Intelligence, Machine Learning, Internet of Things, Big Data, quantum computing, robotics, etc., at the end of 2021.
- **Bengaluru accounts for 25-30 per cent** of India's deep-tech start-ups, followed by **Delhi-NCR** (15-20 per cent) and **Mumbai** (10-12 per cent). Overall, the **share of deep-tech start-ups in India's overall entrepreneurial ecosystem stands at 12 per cent now.**
- India's deep-tech ecosystem has **grown 53 per cent in the last decade**, and is now at par with that in developed economies like the US, China, Israel, and Europe.

- From **drone delivery and cold chain management to climate action and clean energy**, deep-tech start-ups are making their presence felt across sectors.

Challenges

- However, despite impressive growth, deep-tech start-ups continue to grapple with challenges, including **dearth of good talent, access to seed capital and go-to-market opportunities, missing research guidance, high costs of customer acquisition, and more.**

Crucial Role of Funding

- In the **United States, Israel and North Atlantic Treaty Organization countries**, the **government** is still the **largest source of funds** for Deep Tech.
- Billions of dollars of funding flow in through agencies such as the Defense Advanced Research Projects Agency, the Directorate of Defense Research and Development and the Defence and Security Accelerator, much of which becomes the oxygen that small businesses survive on.
- The Indian venture capital ecosystem is cautious when it comes to Deep Tech. Investors are not willing to invest their funds in Deep Tech because it **takes much longer to mature.**

Redirecting CSR and Tax Incentives

- Certain innovations in the existing **corporate social responsibility (CSR)** budgets and **high net worth (HNI)** tax breaks will incentivise **capital flowing** into strategic tech.
- Firstly, the **CSR budgets.** By some estimates, the annual CSR budget is **₹15,000 crore**, of which a **substantial portion goes unutilised.** CSR has traditionally been utilised for the **social sector.**

- However, this growing corpus should also be used for the **development of strategic technology**. Large corporations can be incentivised to use some of this budget to serve the strategic needs of the nation.
- Secondly, **High net-worth individuals (HNIs) can also be offered tax incentives** to make equity investment in the same critical technology startups which would otherwise be frowned upon as high-risk investments.
- To prevent a misuse of funds, it is important to create **qualifying criteria**. The pool of investable companies must be limited to **Government of India-recognised start ups**.

Way Forward

- India will remain a net importer of critical technology in the foreseeable future.
- If correctly aligned with the programmes launched by the Government, CSR funds and the right tax incentives to HNIs can create an almost self-fulfilling prophecy in the nascent Indian Deep Tech ecosystem.

22) Curbing terror financing

(GS3: Challenges to Internal Security through Communication Networks, Role of Media and Social Networking Sites in Internal Security Challenges, Basics of Cyber Security; Money-Laundering and its prevention)

Context

- As the world shrinks with technological and communication changes, terrorists, criminals, weapons and funds are also able to move across national boundaries easily.
- **International co-operation between law enforcement authorities** in this area is essential

for combating such cross border challenges.

Sources of Terror Funds

- Terrorist organisations raise money through **several sources** like **travel agencies, money changers, real estate, retail outlets, NGOs, charitable trusts and even from state sponsors**.
- They also derive funding from a **variety of criminal activities** ranging from low-level crime to organized fraud or narcotics smuggling.

Channels for Flow of Fund

- The global flow of funds for nefarious purposes has three traditional channels.
 - First, **direct smuggling of cash** through international borders.
 - Second, the use of **hawala networks**.
 - Third, **banking networks including SWIFT** and other international channels.
- Recent technological developments in **areas of blockchain or cryptocurrencies** which transcend national boundaries and international currency systems have emerged as a new channel for financing terrorist and other illegal activities.

International Efforts to Tackle the Menace of Terror Financing

- The **Financial Action Task Force (FATF)** was formed in 1989 as a means of bringing order and implementing standards to the monetary system in the world with regard to terror finance and money laundering.
- The **UNSC resolution 1267** in 1999 and **UNSC resolution 1373** in 2001 formed the bedrock of the financial sanctions regime for terrorist organisations and individuals. UN Security Council

has sought to increase efforts against terror financing through UNSC **resolution 2462** of 2019.

- Recently, the UNSC adopted the **Delhi Declaration** on countering the use of new and emerging technologies for terrorist purposes. The declaration aims to cover the main concerns surrounding the abuse of drones, social media platforms, and crowdfunding, and create guidelines that will help to tackle the growing issue.

Role of Financial Intelligence

- The first step in identifying and forestalling the flow of funds to terrorists is to **understand the funding requirements** of modern terrorist groups. The costs associated not only with conducting terrorist attacks, but also with **developing and maintaining a terrorist organisation and its ideology** are significant.
- Terrorists use a wide variety of methods to move money within and between organisations, including the **financial sector, physical movement of cash by couriers, and movement of goods through the trade system.**
- **Charities and alternative remittance systems** have also been used to disguise terrorist movement of funds.
- Only **accurate and well linked financial intelligence** can reveal the structure of terrorist groups and also the activities of individual terrorists. Of late, such **financial intelligence from the private sector** has also given significant clues to foil terrorist acts.

Conclusion

- Unless global terrorist networks and financing are uprooted, it would be difficult to subdue terrorism across the globe.

23) Tackling urban pollution

(GS3: Conservation, Environmental Pollution and Degradation, Environmental Impact Assessment)

Context

- Rampant urban pollution in India necessitates a mindset shift in citizenry and policymakers.

Status of Urban pollution in India

- Urban pollution has a **multiplier effect** on quality of life, productivity and human health with an overwhelming share of seven million lives lost globally per annum.
 - Eighty per cent of all families in Delhi are noted to be **suffering respiratory ailments** due to severe pollution.
 - Over 11 cities in Uttar Pradesh have recorded **poor air quality.**
 - More than 1,10,000 infants are likely to have been **killed by air pollution** in India in 2019.
 - 72 percent of urban sewage is **untreated** in India's urban freshwater bodies.
 - The Central Pollution Control Board says that **more than 50 percent** of 351 river stretches are **polluted.**

How we can improve air and water quality in urban spaces

1. **Expand green cover across urban areas** to reduce dust pollution. Eg: **Ahmedabad's municipal corporation** has planted over 20,000 trees using the **Miyawaki technique** to create the city's 43rd urban forest.
2. **Push for airshed management**, with a focus on understanding meteorological, seasonal and geographic patterns for air quality across a large region. Eg: In **the US**,

the passage of the Air Quality Act (1967) saw the state of California being divided into 35 districts which had similar geographic and meteorological conditions and pollution was regulated at the state level. This approach was successful in reducing emissions by 98 per cent from 2010 to 2019.

3. **Improve sewage treatment plant capacity and ensure linkages with the drainage network.**

Mangalore's City Corporation (MCC) has wastewater treatment plants with end-user linkages.

The MCC offered to supply treated water to such industrial end-users in the city's special economic zone if the end users agreed to fund about 70 per cent of the operations

and maintenance cost of the pumps and the sewage treatment plant.

Way Forward

- At the household level, citizens have to be encouraged to take up rainwater **harvesting, urban roof terrace greening, urban roof water retention tanks and having a green corridor** around residential buildings.
- Municipalities could be encouraged to make **existing roads permeable** with a push for **green landscaping and rain gardens**.
- At the city level, policymakers should push for **"sponge cities" and incorporate disaster planning**.

Model Questions

- 1) Critically analyse the role of women in the animal husbandry sector. Also comment on the role of the government in promoting women as livestock farmers.
- 2) Behavioural nudge has made the swachh bharat abhiyan a successful scheme. Can LiFE adopt the same strategy on a global level?
- 3) Millets will have to be the staple food in the future. Comment on the above statement with respect to its climate sustainability and nutrient content.
- 4) Corporate social responsibility has made the corporates to be socially responsible. Has the law achieved its objectives? Also discuss the ways in which it can be made more environmentally responsible.
- 5) Can a constitutional amendment be brought on to end the discretionary powers of the governor on withholding the assent to a bill? Comment.
- 6) Supply chain in mineral resources should be continuous to develop the economy of the country. Discuss the ways in which the Government of India is trying to acquire key mineral resources.
- 7) Examine the potential of Agripreneurship in alleviating rural distress.
- 8) Discuss how Artificial Intelligence can play a major role in promoting sustainable agriculture.
- 9) What are the major characteristics of Organic Farming? In the context of India, discuss the challenges in adopting Organic Farming.
- 10) Technology, at best, can assist us, not lead us, for a sustainable world. But forests can assist and lead us to a sustainable world. Comment.
- 11) The incorporation of urban agriculture into urban land use planning will have multidimensional benefits for urban areas. Discuss
- 12) What is meant by "zoonoses". What are the measures taken to address livestock diseases in India.
- 13) Explain how Swachh Bharat Abhiyan contributed to a drastic change in the sanitation status of India.
- 14) Elucidate the scope and opportunities of India's food processing industry. Elaborate on policy initiatives by the government to tackle the challenges associated with the food processing sector.
- 15) India has one of the least efficient logistics in the world. In this scenario explain how National Logistics policy can help improve logistics in India.

- 16) Has caste lost its relevance in understanding the multi-cultural Indian Society? Elaborate your answer with illustrations.
- 17) "A unified nation do not necessarily need uniformity". Comment on the statement with reference to Uniform Civil Code.
- 18) What is fujiwhara effect? Explain it's mechanism of formation. Analyse the impact of tropical cyclones in India.
- 19) What is meant by "One-Health" What are the causes for Anti-microbial resistance in humans?
- 20) Mission Karmayogi aims to bring a paradigmatic shift in the capacities, mindset and actions of the civil servant. Discuss
- 21) Deeptech will reduce India's dependence on foreign nations and make it Atmanirbhar. Critically analyse the ways in which deeptech can be promoted in India.
- 22) Terror financing is made easy with technological advancements. In this regard, enumerate the national and international efforts taken that help curb terror financing.
- 23) With rampant urban pollution levels in Indian cities, what steps can help improve the air and water quality in urban areas? Explain with examples.