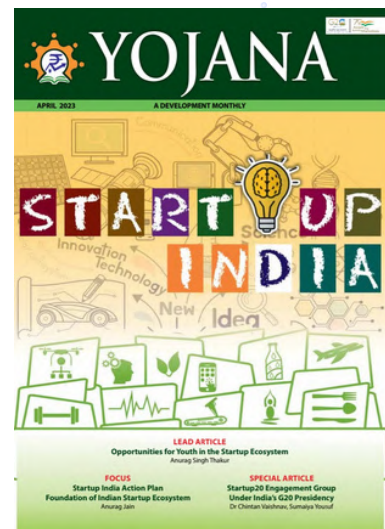


OFFICERS' Pulse

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1) Underpricing urea increases consumption

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

Context

- The sales of urea have crossed an all-time high 35.7 million tonnes (mt) in 2022-23. Urea is the primary cause of **worsening plant nutrient imbalance and deteriorating soil health**.

Government measures to control urea consumption

- Nutrient-based subsidy (NBS) regime:** In order to promote balanced fertilization of soil, Nutrient Based Subsidy programme for fertilizer was initiated in the year 2010. Under the scheme, a **fixed amount of subsidy** decided on an annual basis is provided on **each grade of subsidized Phosphatic and Potassic (P&K) fertilizers based on its nutrient content**.
- Neem coated urea:** The Department of Fertilizers (DoF) has made it **mandatory for all the domestic producers to produce 100% urea as Neem Coated Urea (NCU)**, to improve soil health, reduce usage of plant protection chemicals etc.
- Nano urea:** It is urea in the form of a nanoparticle to replace conventional urea that can **curtail the requirement of the same by at least 50%**.
- Encouraging farmers to incorporate **compounds that reduce ammonia volatilisation**.

Concerns

- None of the above said measures have succeeded in their stated goal of achieving balanced fertilization.

- Urea consumption has gone up by over a third** compared to the pre-NBS year of 2009-10.
- Instead of discouraging nitrogen use** at the expense of other primary, secondary and micronutrients, **farmers are over-applying urea** which is clear evidence of declining nitrogen use efficiency and crop yield response to fertilizers.

Pricing Mechanism

- Currently, **Urea is the only controlled fertilizer** and the **maximum retail price (MRP) of urea is statutorily fixed by the Government**. The difference between the production cost and the MRP is reimbursed to manufacturers.
- Retail prices of **non-urea fertilisers** such as Di-ammonium Phosphate (most widely used one after urea), Muriate of Potash (MoP) are **decontrolled** and are **determined by manufacturers**, while the Centre gives a **fixed subsidy** each year.

Reason for skewed nutrient usage

- The **MRP of urea has been unchanged per tonne** since November 2012 which is **priced far less than other fertilizers** like di-ammonium phosphate, muriate of potash and other complex fertilizers.
- Linking subsidy to the nutrient content of fertilizers failed because **NBS excluded urea** and was implemented only for other fertilizers.

Way Forward

- Raising the maximum retail price (MRP) of urea** is the only solution to control rampant overuse of urea resulting from underpricing.
- Bringing urea under NBS** while decontrolling MRP of urea would

pay a fixed per-tonne subsidy linked to its nutrient content of 46 per cent nitrogen.

- In the long run, even the **NBS should be replaced by a flat per-acre subsidy** that could be given for every crop season which would result in judicious application of fertilizers.

2) India - the most populous country

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

Context

- India has officially surpassed China to become the most populous country in the world. Let us analyze the opportunities and challenges abound.

World Population statistics- a declining trend in future

- According to the **United Nations' World Population Prospects (UNWPP) 2022** report, the world reached the 8-billion mark in November 2022.
- It projects that around **61 countries** or areas will see **negative growth** by 1 per cent between **2022 and 2050**.
- It notes that the **populations of a large part of the world**, including Eastern and South Eastern Asia, Central and Southern Asia, Latin America, the Caribbean, North America and Europe, are expected to **start declining before 2100**.
- A study published in **The Lancet** in 2020 states that the global population is projected to peak in 2064 at 9.73 billion people and **decline to 8.79 billion by 2100**.
- The UN Population Fund reckons that a **TFR of 2.1** is necessary for

a country to attain population stability. The global **Total Fertility Rate (TFR)** will go down to **1.66** in 2100.

- India's total fertility rate came down to **2** in 2020-2021 from about **3.4** in the early Nineties. However **India** is also projected to continue its steep decline in total fertility rate, which will reach **1.3** along with a **total population of 1.1 billion**, in 2100.
- According to the **National Bureau of Statistics (NBS)**, there occurred a reversal of a positive population growth trend that **China** had recorded over decades with 8,50,000 fewer people in 2022 than the previous year.
- **South Korea**, the country with the **lowest fertility rate** in the world, beat its own record and reported a birth rate of **0.78** – down from 0.81 in the previous year.

Negative impacts of population control

- **China** with its **one-child policy** hurtled down the "population control" path and is now suddenly faced with a **negative growth rate and a rapidly aging population**.
- Reducing population growth sometimes has a **component of patriarchy**.
- In India and other countries like China, South Korea and Japan, which have a general **preference for male offspring** and patriarchal norms, population decline has been parallel to an **adverse sex ratio**.
- In some countries, there may also be an **economic cost to declining populations**. Because dwindling population numbers mean that health facilities, schools, and publicly-funded institutions will

need to keep providing services for a few at great costs.

- Rapidly greying population with a **decreasing younger and productive population** may result.

Way Forward

- **Employing coercive methods** like making people with more than two children ineligible for government jobs, **must be curbed**.
- Governments must follow the time-tested methods of **empowering women and investing in their education and strengthening healthcare facilities** in parts of the country where the TFR is above the national average — Uttar Pradesh, Bihar, Jharkhand, Meghalaya.
- **Education, skill development and creating opportunities**, especially for the youth of disadvantaged sections and women, will hold the key to the country using the **demographic dividend to its advantage** in the next 20 years.
- India should **step up its investments in education and the professional skills** of its youth to ensure that they can contribute significantly not only to India but to the global economy, particularly in countries with declining populations.
- India needs to make sure that its **aging population is looked after through improved state-supported care**.

3) Quantum leap

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

Context

- The Union Cabinet has approved the **National Quantum Mission**

(NQM) at a total cost of Rs.6000 crores from 2023-24 to 2030-31 which made **India become the seventh country with a dedicated quantum mission**.

What is Quantum computing?

- Quantum computing is a rapidly-emerging technology that **harnesses the laws of quantum mechanics** to solve problems too complex for classical computers.
- Quantum computing uses **quantum bits, or qubits**.
- **Classical computers** employ a stream of **electrical impulses (1 and 0)** in a binary manner to encode information in bits. This restricts their processing ability, compared to quantum computing.
- **Quantum computing** uses subatomic particles, such as electrons or photons. Quantum bits, or qubits, allow these particles to **exist in more than one state (i.e., 1 and 0) at the same time** which allows a quantum computer to perform far more calculations with far fewer qubits.

About National Quantum Mission

- **National Quantum Mission** aims to seed, nurture and scale up scientific and industrial R&D and create a vibrant & **innovative ecosystem in Quantum Technology (QT)**.
- Under the mission, **Four thematic hubs** will be set up to research quantum computing, quantum communications, quantum sensing and metrology, and quantum materials and devices.
- The NQM targets **developing intermediate scale quantum computers** with 50-1000 physical qubits in eight years in various platforms like superconducting and photonic technology.

- The NQM will **develop satellite-based secure communications** between ground stations over a range of 2,000 km, along with long-distance secure quantum communications with other countries, and a multi-node quantum communication network.
- The NQM mission will also develop **magnetometers** with high sensitivity, and atomic clocks to enable precision timing, communications, and navigation.

Significance of quantum computing

- A quantum computer could **deliver accurate meteorological projections, perform seismic data analysis, analyze protein folding**, etc.
- The tasks performed by them involve computations so complex that even supercomputers cannot handle them.
- The NQM can lead to benefits across fields as diverse as **communications, health, financial sector, energy management, drug design, as well as aerospace and military applications**.

Challenges associated with quantum computing

- Superpositions (where a qubit is both on and off) can **collapse quickly**.
- The software programming is different, and **requires excellent error control and management**.
- Researchers have found it **hard to maintain physically stable configurations**.
- They are huge installations which must be housed in **super-cold, seismically stable places** since even passing trucks can cause errors through imperceptible tremors.

- **Special materials and rare helium isotopes** are used to manage cooling and shielding, quite apart from specialized semiconductors.

4) Healthy reduction of Out of Pocket expenditure

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

Context:

- One of the relatively healthy developments in Indian healthcare in recent years has been the steady fall in the average out-of-pocket expenditure (OOPE). However, the Government's Health expenditure has to be increased to further reduce OOPE.

What is Out Of Pocket Expenditure?

- Out-of-pocket expenditure is the **money paid directly by households, at the point of receiving health care** as a percentage of total healthcare expenditure.
- This occurs when services are neither provided free of cost through a government health facility, nor is the individual covered under any public or private insurance or social protection scheme.

Findings of National Health Accounts 2019-20

- India has **continued to reduce OOPE** from a high of 62.6 percent in 2014-15 to **47 per cent in 2019-20**.
- In the same period, government **health expenditure rose from 29 to 41 per cent** of total healthcare expenditure.
- **Private health insurance** also appears to have grown in this period, from 3.7 to **7 per cent**.

Significant input from the finding

- Long-term trends since 2013-14 suggest a **strong correlation between rising government health expenditure and falling OOPE.**
- For instance, 8 percent rise in government expenditure in the years between 2016-17 and 2017-18 resulted in almost 10 percentage point drop in OOPE.

Concerns associated with the findings

- These figures pertain to the year **before the outbreak of the Covid-19 pandemic.**
- Although OOPE has steadily declined over the last 5 years, the fact is that **Indians still spend far too much** from their own pockets to defray health expenses.
 - For instance, OOPEs as a percentage of total healthcare expenditure for countries such as **Indonesia, Malaysia and China** hover in the **mid-30s.** (47 percent in India)
- Both the Central and state governments still **underspend on healthcare.**
 - **Government health expenditure** as a percentage of gross domestic product (GDP) between 2014-15 and 2019-20 **rose only marginally**, from 1.13 per cent to **1.35 per cent**, though the **per capita spend nearly doubled.**
 - **State's health spending is just 4-5 per cent of their total budget.**

Way Forward

- The aim to raise health expenditure to **2.5 per cent of GDP by 2025** would make an appreciable difference to OOPE,

provided the states also increase their health allocation.

5) Plastic ban failure

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

Context

- The ban on single-use plastic products did not yield effective results due to implementation and enforcement gaps which have to be addressed.

Background

- India has defined **single-use plastic as disposable plastics** that are commonly used for packaging and include items intended to be **used only once** before they are thrown away or recycled.
- The **central government had prohibited the usage of following identified single use plastic items**, which have **low utility and high littering potential** from 1st July, 2022 under **Plastic Waste Management Amendment Rules, 2021.**
 - Earbuds with plastic sticks, plastic sticks for balloons, plastic flags, candy sticks, ice-cream sticks, polystyrene [Thermocol] for decoration;
 - Plates, cups, glasses, cutlery such as forks, spoons, knives, straw, trays, wrapping or packaging films around sweet boxes, invitation cards, and cigarette packets, plastic or PVC banners less than 100 micron, stirrers.
- It also prohibited **manufacture, import, stocking, distribution, sale and use of plastic carry**

bags having thickness less than seventy-five microns from 30th September 2021, and having **thickness less than thickness of one hundred and twenty microns** from 31st December, 2022.

Current status of plastic ban

- Although some of the **bulk consumers** of single use plastics have **switched to biodegradable alternatives**, most other producers, sellers, and consumers of the use-and-throw plastic stuff **continues their business as usual**.
- **Lack of noticeable improvement** in the system of **collection and safe disposal** of discarded plastic material exacerbates the menace of plastic pollution.
- Thrown-away plastic products, apart from littering roads and piling up at landfill sites, have started **polluting water bodies**.

Evidences for plastic ban failure

- The **Central Pollution Control Board (CPCB)** recently said that the use of disposable plastic items, particularly thin carry bags, is continuing in the low-end section of the economy.
- A recent **anti-plastic drive** carried out in **Kerala** led to the confiscation of 25 tonnes of proscribed plastic material.
- A **100-day "beat plastic campaign"** culminated in **Delhi** recently resulted in the seizure of over 14,000 kg of outlawed plastic items. Delhi is the largest producer of plastic waste among all the metropolitan cities in the country.

Reasons for plastic ban failure

Lackadaisical enforcement of the Plastic Waste Management Rules:

- While the prohibition of the use of single use plastics was imposed by the Centre, its **implementation was left to the states** and their pollution control boards.
- Centre **failed in taking up follow-up action** on bulk consumers switching over to biodegradables.
- Centre failed to ensure states to put in place an effective legal framework for plastic waste management.
 - For instance, Though the local government of Delhi had framed the Plastic Waste Management Rules way back in 2019, these are yet to be notified.

Lack of Alternatives:

- The other major reason for the failure of the ban on disposable plastic ware is **inadequate availability of their cost-effective alternatives**.
- **Investment in research and development** of suitable substitutes for use-and-throw plastic goods still remains low and it also lacks government's incentives.

Way Forward

- A well-advised **multi-pronged strategy** is needed instead of a piecemeal approach to address this issue comprehensively right from production to retrieval and appropriate recycling or disposing of the limited-utility plastic products is needed.

6) Monitoring dam safety

(GS3: Disaster and Disaster Management)

Context

- Even after the enactment of the **Dam Safety Act in 2021**, the threat to the life, property, and

livelihood of millions of people from dam-related perils remains endless.

Status of Indian dams and issues associated

- India has **more than 5,740 large dams** and countless other barrages.
- **India is now placed third in the world**, next to China and the US, in terms of the **number of functional dams**.
- Nearly **20 percent of the dams in India have outlived** their rated life span of 50 years.
- Most of these old dams were constructed with **locally available material** and in accordance with the water flows and risk factors prevailing at that point of time.
- Further development of the water-use infrastructure in the later years and **global warming-induced uncertainties of the volume of water** flows poses a major risk on the old dams.
- Risk factors like **flash floods, landslides, and increased sedimentation** are much more pronounced now than in the past.
- The latest report of the Parliamentary Standing Committee on Water points out that though **234 large dams are 100-300 years old**, none has been decommissioned.
- Retiring a dam has rarely been deemed an option in India even if the structure turns highly hazardous.
 - For instance, nearly **130-year-old Mullaperiyar dam is not being replaced** with a new one despite having been declared unsafe by the Kerala government.

- The country has witnessed more than **40 major dam failures** in recent decades. Some of them include the calamity in Chamoli, Uttarakhand in 2021 and the most disastrous being Machchu Dam failure in Gujarat in 1979.

What is the Dam Safety Act?

Main Objective

- The Act proposes to help all states and Union Territories **adopt uniform dam safety procedures**. It provides for the surveillance, inspection, operation, and maintenance of **all specified dams** across the country. These are dams with **height more than 15 metres, or height between 10 metres to 15 metres** with certain design and structural conditions.
- As of 2019, India has 5,745 large dams. Of these, 5,675 large dams are operated by states, 40 by central public sector undertakings, and five by private agencies. **Over 75% of these dams are more than 20 years old and about 220 dams are more than 100 years old.**
- Due to the lack of legal and institutional architecture for dam safety in India, dam safety is an issue of concern. Unsafe dams are a hazard and dam break may cause **disasters**, leading to huge loss of life and property. Therefore, monitoring dam safety is essential.

Legal Provisions

- Though **water** is under the **state list**, the Centre has brought the legislation under **Article 246 of the Constitution** read with **Entry 56 and Entry 97 of List I in the Union list**.
- **Article 246** empowers Parliament to legislate on any matter enumerated in List I of the Union list in the Seventh Schedule of the Constitution. **Entry 56** allows

Parliament to make laws on the regulation of inter-state rivers and river valleys if it declares such regulation to be expedient in public interest. **Entry 97** allows Parliament to legislate on any other matter not enumerated in List II or List III including any tax not mentioned in either of those Lists.

National Committees

- The Act constitutes two national bodies: the **National Committee on Dam Safety**, whose functions include evolving policies and recommending regulations regarding dam safety standards; and the **National Dam Safety Authority**, whose functions include implementing policies of the National Committee, providing technical assistance to State Dam Safety Organisations (SDSOs), and resolving matters between SDSOs of states or between a SDSO and any dam owner in that state.

State Bodies

- It also constitutes two state bodies: **State Committee on Dam Safety**, and **State Dam Safety Organisation**. These bodies will be responsible for the surveillance, inspection, and monitoring the operation and maintenance of dams within their jurisdiction.
- The state dam safety organisation must also report events such as dam failures to the National Dam Safety Authority and also maintain records of major dam incidents of each specified dam.
- Functions of the national bodies and the State Committees on Dam Safety have been provided in **Schedules to the Act**. These Schedules can be amended by a government notification.

Penalties

- An offence under the Act can lead to **imprisonment of up to two years, or a fine, or both**.

Way Forward

- **Precise estimation of the potential life span of dams** following the US system of risk appraisal through a web-based integrated risk management model called **Dam Safety Analysis Tool** using variables from dam bursts in the past is needed for decommissioning them. It generates a fairly reliable prognosis of downstream risks of dam failures.
- **Decommissioning vulnerable dams**, which is a common practice to avert dam-related disasters in developed countries, notably in Europe and the US, should also be followed by India.
- An **indigenous system** for this purpose, using the expertise available in scientific institutions like the Indian Institutes of Technology for monitoring dam safety would be of great help in preventing dam-related mishaps.

7) Artificial Intelligence and the future of employment

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

Context

- The widespread adoption of **generative artificial intelligence (AI)** will lead to **productivity gains** along with **big changes in employment patterns**.
- A recent study says about **18 percent of full-time global employment amounting to 300 million jobs could be replaced by AI**.

What is Generative Artificial Intelligence?

- Generative AI is a type of artificial intelligence technology that can produce various types of **content, including text, imagery, audio and synthetic data.**
- It has its applications in **ChatGPT, Deep Fakes** etc

Highlights of the study

- Generative AI is **easy to use**, given the ability to generate human-seeming content output across speech, audio, and video, and a comfort with natural language instructions.
- The study referred to exponential increases in raw computing power, which enables rapid gains in the **complexity of tasks AI can perform.**
- A large component of clerical work across government departments and courts, office and administrative functions, legal work, architectural and engineering work can be automated with efficiency gains but **loss of permanent employment.**
- The algorithms of generative AI have already surpassed the human average for tasks like image classification, and even reading comprehension.
- AI automation would have the **lowest impact in India**, followed by Kenya, Vietnam, Nigeria, Mainland China, and Thailand.
- The highest impact will be in Hong Kong, followed by Israel, Japan, Sweden, the US, and the UK because in general, **developed nations are far more exposed** with two-thirds of current jobs exposed to some **degree of automation.**

Challenges of AI adoption

- **11-12 per cent reduction in employment opportunities** with AI adoption will have severe implications, given a trend of widespread unemployment and underemployment.
- Entire categories of jobs that India would have hoped to create include **offshored jobs** like entry-level programming, customer service, documentation are now in danger of being lost due to automation.
- Individuals who become unemployed due to automation **aren't necessarily absorbed into other more productive jobs**, which indicates an increase in unemployment levels.
- It **adds up to the existing issues in the political front** like **lack of credibility in job creation numbers** in the face of mounting job losses and **meagre amount of unemployment allowance.**

Way Forward

- Policymakers by **encouraging India's large IT workforce** to focus on AI research, should look to **accelerate productivity gains**, and **ensure alternative employment opportunities.**
- Fundamentally rearchitecting how we educate and skill our youth population, building supportive infrastructure, protecting workers' rights, and expanding the kind and nature of work we value is also needed at this hour.

8) Building a blue economy

(GS2: India and its Neighborhood-Relations)

Context

- This article talks about the **underlying cause of Indo-Sri Lanka fishing disputes.**

Indo-Srilankan fishing rights dispute

- A long standing **Indo-Sri Lankan dispute over fishing rights lies in the Palk Strait**, the water body separating Tamil Nadu from the Jaffna region of Sri Lanka.
- The Indo-Sri Lankan **maritime boundary agreements signed in 1974 and 1976, allowed fishermen of both nations to enjoy in each other's waters.**
- Since maritime boundaries **lack physical demarcation**, the **lull in fishing activity**, during the civil war in Sri Lanka, encouraged Indian fishermen to **encroach into Sri Lankan waters.**
- With the end of hostilities in 2009, the Sri Lankan fishing community sought to reclaim their rights, bringing them into conflict with Indian fishers.

India's fisheries potential

- India ranks amongst the **world's leading seafood exporting nations.**
- The fisheries sector has shown steady growth and has become a major contributor of **foreign exchange.**
- Fisheries provide **livelihood** to about **15 million fishers and fish-farmers** at the primary level, and generates almost **twice the number of jobs, along the value-chain** — in transportation, cold-storages, and marketing.
- Fish, being an affordable and rich source of animal protein, is one of the healthiest options to **mitigate hunger and malnutrition in India.**

Challenges in realizing India's potential

- India's **artisanal fishers (poor, small-scale fishers)** who have dominated India's marine fishery since Independence **deliver only 2 percent of marine fish** to the market, while **98 percent is**

caught by mechanized and motorized craft.

- **India does not own a fishing fleet** and hence **Indian trawlers do not venture into rich fishing grounds.** Due to which our fishermen have to **compete with those of neighbors**, Sri Lanka and Pakistan, in **restricted fishing grounds.**
- Fishing vessels often drift, inadvertently into foreign waters leading to apprehension by navies/coast guards and prolonged imprisonment of the crew.
- The rich resources in **India's exclusive economic zone (EEZ) remain underexploited** and much of the catch from our fishing grounds is taken away by the better equipped fishing fleets of other Indo-Pacific countries.
- Most of India's **fisheries exports are at a low level of value addition** without going for higher-order "ready-to-eat" or "ready-to-cook" marine products.

Lessons to be learnt from china

- China has mobilized the fishing industry to meet the rising demand for protein in the Chinese diet that made them "**fishery superpower**".
- It **owns the world's largest deep-water fishing (DWF) fleet**, with boats that stay at sea for months or even years.
- China had begun **distant deepwater fishing**, as far back as in 1985.
- China also uses a part of its fishing fleet as a "**maritime militia**", which assists the navy and coast guard in their tasks.

Way Forward

- India needs to evolve a long-term vision for its fishing industry with focus on four areas
 - **Mechanization and modernisation of fishing vessels** by providing communication links and electronic fish-detection devices, with artisanal fishers being funded for this;
 - **Developing deep-water fishing fleets**, with bigger, sea-going trawlers equipped with refrigeration facilities;
 - A DWF fleet will have to be built around the **“mothership” concept**, wherein a large vessel would accompany the fleet to provide fuel, medical and on-board preservation/processing facilities;
 - **Development of modern fishing harbors** with adequate berthing and post-harvest facilities, including cold storage, preservation, and packaging of fish.

Conclusion

- Reaching out across the Palk Strait to form an **“Indo-Sri Lankan Fishing Corporation”** under **Pradhan Mantri Matsya Sampada Yojana** with a **deepwater fishing fleet and dedicated fishing harbors** provide a huge boost to the fishing industries of both nations.
- It also removes an unwanted irritant in bilateral relations and sends out a positive message of **SAGAR: “Security and Growth for All in the Region”**.

9) Death of the Nile

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

Context

- Poor environmental and water management have turned the Nile River Delta into one of the largest polluted areas on the planet.

Nile River Delta

- The River Nile in **Africa** is considered as **one of the longest rivers in the world**. It has a length of about 6,695 kilometers (4,160 miles).
- It originates in **Burundi**, south of the equator, and flows **northward through northeastern Africa** to drain into the **Mediterranean Sea**.
- The Nile River forms an **arcuate delta** as it empties into the Mediterranean Sea.
 - *Deltas that are triangular or fan-shaped are called arcuate deltas.*
- The Nile is formed by **three principal streams**: the **Blue Nile**, the **Atbara**, and the **White Nile**.



Recent Findings

- The Nile river delta is **contaminated with heavy metals, such as cadmium, chromium, lead, copper, zinc, and manganese.**
- Researchers revealed that this pollution could be due to the **building of mega dams.**
- The researchers say that **much of this contamination is irreversible;** however, adopting **conservation measures could help in restoring the river to a healthier state.**

Causes for pollution

- Large-scale pollution from **untreated agricultural drainage and wastewater** is exerting existential pressure on the delta system.
- **Coastal erosion and seawater intrusion** challenge the sustainability of the delta, posing a threat to food security in the region.
- The **high concentrations of cadmium, chromium, copper, lead, nickel, and zinc** are **carcinogenic in nature** and can adversely affect **plants** (chlorosis in leaves and necrosis) and **human health.**
- **Mega-dams** built upstream **disrupt the river's natural flow and sediment flux** and thus adversely affect its ability to flush contaminants out into the Mediterranean Sea, leaving **toxins to build up in bottom sediment over time.**

Way Forward

- There is a **need for more research** on the environmental impacts of untreated water recycling and the change in river turbidity under increased upstream damming of the Nile.

- **Collaborations among nations** of the Nile River Basin on continued research will help in pursuing a shared interest toward maintaining a healthy Nile River system.

10) A Debt to offset

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

Context

- The countries most vulnerable to the effects of climate change are often the least able to afford the investment needed to strengthen their resilience. This is primarily because of their debt burden.

Debt for climate swap

- A debt-for-climate swap is an **agreement between the creditor and a debtor** by which the **former forgoes a portion of the latter's foreign debt, or provides it debt relief,** in return for a **commitment by the government to invest in a specific environmental project.**
- This could be developing climate resilient infrastructure, protecting biodiversity, etc.
- In the past decade, debt-for-climate swaps have grown relatively **popular among low- and middle-income countries.**

Background

- **Debt-for-nature swap** first appears to have been used in the **1980s in Latin America,** where the countries aimed to **reduce unsustainable external debts and address worsening environmental conditions.**
- **Debt-for-climate swaps** emerged as a **broader concept** in the **2000s** for **not only conservation but also climate mitigation and adaptation.**
- The first debt for climate swap was implemented in **2006** between **Germany and Indonesia.**

Significance

- Debt for climate swap was introduced as a **debt restructuring device** that aims to combat climate change by ensuring that debt-ridden countries do not incur additional debt while addressing climate change locally.
- They possess **dual objectives**: to promote **specific investment and policy action** on one hand and **promote debt relief on the other**.
- The signatories to the **Paris Agreement** and the **Glasgow Financial Alliance for Net Zero**, a global coalition of financial institutions, have a commitment to provide **financial assistance to developing countries** to build clean, climate-resilient futures. Debt-for-climate swaps are one way to fulfill their commitments.
- Debt-for-climate swaps **support climate investment** by committing a country to swing their spending from debt service to an agreed public investment.

Hope for small island countries

- The small island developing states (SIDS) can make use of debt-for-climate swaps, to address challenges such as: **adapting to increasing climate risk and recovering from financial distress**.
- In debt-for-climate swaps, bilateral and multilateral debt relief could enable SIDS to **reduce their external debt** while investing the liberated funds in **national climate adaptation and mitigation programmes**.
- **Success stories**:
 - In 2017, **Seychelles** announced the successful conclusion of negotiations for a debt-for-adaptation swap under a **tripartite model**. The Nature

Conservancy (TNC), a US-based environmental organization, bought \$22 million of its debt in exchange for a promise to create 13 new marine protected areas.

- In 2021, **Belize**, in Central America, reduced its debt by 10 percent of its GDP and acquired funds to protect coral reefs by striking a \$553-million swap deal with TNC.

Conclusion

- Debt for climate swaps is mainly advantageous for developing countries. However, the scaling up of the debt swap is still much lower than grants as creditors do not see their gain in this deal.
- Debt swaps can only be successful if the creditors are not rigid on returning the debt's whole value.

11) The last frontier

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

Context

- Growing commercial interests in the Southern Ocean's resources serve as a hindrance to conservation efforts in the region.
- The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), which usually meets in October every year, has called for a special meeting in June this year to resolve differences amongst member countries.

About CCAMLR

- The Commission for the Conservation of Antarctic Marine Living Resources was established in **1982** with the **objective of conserving Antarctic marine life**.

- It was signed by 14 states and has been ratified by 35 states (including **India**).
- It is headquartered in **Hobart, Tasmania, Australia**.
- It aims at **preserving Antarctic marine life and promoting environmental integrity in the region**
- The CCAMLR was established in response to increasing commercial interest in Antarctic krill resources, and over-exploitation of several other marine resources in the Southern Ocean.

Recent Issues

- In 2009, the CCAMLR pledged to **designate a network of marine protected areas by 2012**. It divided the Antarctic region's high seas into **nine planning domains**.
- Countries that wish to set up **Marine Protected Areas (MPAs)** in these high seas, submit a proposal to CCAMLR. So far, CCAMLR has established **only two MPAs**.
- Proposals for setting up three more MPAs are in limbo, due to a lack of consensus among member countries of CCAMLR. This lack of consensus is attributed to **differences amongst member countries on commercial interests** in the Antarctic region which is rich in minerals and marine life.

Krill Fisheries

- Antarctic krills, are tiny shrimp-like crustaceans that form the base of the Antarctic food chain.
- Since krills feed on ice algae, researchers fear that their stock may get **significantly affected as the region loses pack ice due to global warming**.
- **Commercial fishing of krill** has significantly increased in the last

five years. They are highly prized as fish feed.

- Their **omega-3 fatty acid** is in demand for **high-value pharma and nutraceutical products**.

Marine Protected Areas

- An MPA is a defined region that is **managed for the long-term conservation of marine resources, ecosystem services, or cultural heritage**.
- They can be established in **national and international waters** to preserve the biodiversity of the marine environment.
- MPAs **do not necessarily exclude fishing, research or other human activities**

Status of MPAs in the Antarctic

- The Southern Ocean has **two MPAs**, one in the **Southern shelf of the South Orkney Islands** and the other in the **Ross Sea**.
- These MPAs **protect only 5 percent of the ocean**.
- Proposals to establish MPAs in East Antarctica, the Weddell Sea, and the waters surrounding the Antarctic Peninsula have been met with resistance by China and Russia.

Conclusion

- Most countries have agreed in principle to establish MPAs in Antarctica, and this is expected to be discussed further at the next CCAMLR Meeting.
- The establishment of MPAs in Antarctica is crucial for preserving the region's marine resources and unique biodiversity.

12) Farmer producer organizations

(GS3: Storage, Transport and Marketing of Agricultural Produce and Issues and Related Constraints)

Context

- In recent times Farmer producer organizations (FPOs) are gaining prominence in the country.

About FPOs

- Farmers Producers Organisation is an organization, where the **members are farmers themselves**. FPOs provide **end-to-end support and services to the small farmers, and cover technical services, marketing, processing, and other aspects of cultivation inputs**.
- To facilitate the process, the **Small Farmers Agribusiness Consortium (SFAC)** was mandated by the Government of India to support the State Governments in the formation of the FPOs.
- The goal is to **enhance the farmers' competitiveness** and to **increase their advantage in emerging market opportunities**.

Potential of FPOs

- The major operations of FPOs include the **supply of seed, machinery, market linkages & fertilizer, training, networking, financial and technical advice**.
- FPOs work toward **ensuring a better income** for the producers through an organization of their own.
- Small producers do not have the volume individually to get the **benefit of economies of scale**.
- In **agricultural marketing**, there is a **chain of intermediaries**, who often work non-transparently leading to the situation, where the producer receives only a small part of the value, which the ultimate consumer pays. This can be eliminated by promoting FPOs.
- FPOs have **better bargaining power** in the form of bulk buyers of produce and bulk suppliers of inputs.

- FPOs in Gujarat, Maharashtra and Madhya Pradesh, Rajasthan, etc have shown encouraging results and have been able to realize higher returns for their produce.

National Initiatives

- The government has launched a central Sector Scheme named "**Formation and Promotion of Farmer Producer Organisations (FPOs)**" with an aim to form and promote **10,000 new FPOs in the country by 2024**, with a budgetary provision of Rs.6,865 crore over the next five years.
- The government is also offering a **Credit Guarantee Scheme** which aims to provide risk cover to banks that **advance collateral-free loans to FPOs up to Rs 1 crore**.

Challenges Faced by FPOs

- Many FPOs **lack technical skills** and suffer from **insufficient professional management**.
- FPOs face **hindrances with regard to accessing credit facilities**.
- **Issues such as working capital, and marketing**, have to be addressed while scaling up FPOs.
- FPOs need to be **linked with technical service providers, processing companies, retailers, etc.**

Conclusion

- In recent times, the Centre has encouraged FPOs to help farmers. It is important to take active steps to not only promote FPOs but also reap their full potential.

13) Dealing with extreme heat

(GS1: Important Geophysical Phenomena such as earthquakes, Tsunami, Volcanic activity, cyclone etc.)

Context

- Around **350 million Indians** were exposed to **strong heat stress** between April and May 2022.

- Between **2021 and 2050**, it is expected that the maximum temperature will rise by **2-3.5°C in 100 districts** and by **1.5- 2°C in around 455 districts**.
- Similarly, **winter** temperatures will rise between **1°C and 1.5°C** in around **485 districts in the country**.
- Such a sharp rise in urban temperatures is rare. However, with climate change exacerbating local weather patterns, India is likely to see April-May temperatures reaching **record highs every three years**.

Weather variability

- Our cities are beset with the **urban heat island effect**, with temperatures **4-12°C higher** than rural outlying areas.
 - *An urban heat island occurs when a city experiences much warmer temperatures than nearby rural areas.*
- Meanwhile, **humidity has exacerbated** the felt temperature, with wet bulb temperatures often rising above **32°C** in many cities.
- More recently, northern India has seen **significant variability** in the weather. **Cold weather** in January was followed by a **heat wave** in February and early March, and **hailstorm and heavy rain** in the past few weeks.
- Weather variability has **consequences**, especially for **agriculture**. For example, 90% of India's cumin production is from Gujarat and Rajasthan. The recent weather variability has **destroyed the majority of the cumin crop** in Rajasthan. From agricultural crop losses, it is a short step towards **drought and higher mortality**.
- Rising temperatures have also led to **increasingly unliveable cities**. For labourers doing heavy work,

heat exposure leads to a loss of 162 hours per year, as per one study.

- A rise in temperatures directly **impacts labour productivity**. About 50% of India's workforce is estimated to be exposed to heat during their working hours.
- This includes **marginal farmers, labourers at construction sites and street vendors** parlaying their produce on the streets; increasingly, even **gig economy workers** are affected.

Mitigating the problem

- **Greening** could help mitigate part of the problem.
- Ideally, **for every urban citizen** in India, we should have at least **seven trees** in the urban landscape.
- Development plans for Tier 2 and Tier 3 cities can set up a mandate to **increase urban surface area that is permeable**, while **pushing to increase the density and area of urban forests**.
- **Expanding wetlands and restoring dead and decaying ponds/lakes** may also help ensure ecological functioning along with reducing urban heat.
- There is a need to **reduce the urban heat island effect**. This will require a push for **greater usage of permeable materials** in civic infrastructure and residential construction and enhancing natural landscapes in urban areas.
- Urban layouts such as **brick jalis** for ventilation and **terracotta tiles** to allow hot air to escape, and **curbs on anthropogenic heat emissions** from vehicles, factories, etc. may be considered.
- **Urban building standards** should be **upgraded** to avoid usage of heat-absorbent galvanized iron and metal roof sheets.

- Additionally, using **cleaner cooking fuels** will reduce indoor air pollution, which may also help reduce urban heat. Streets with low ventilation may need **further expansion**, or an **increase in natural vegetation**.
- Other measures can also be considered – from embracing **public transportation**, to reducing personal vehicle usage and, most importantly, **reducing the size of landfills**.
- **Methane production** from mountainous landfills may lead to **fires**, often exacerbating urban heat and weather variability in our cities. A push for **waste segregation**, along with solid waste management at source, can help.

Chandigarh model

- The urban design of Chandigarh considered **climate responsiveness** as a key factor. The city was set up by the foothills of the Shivaliks, between two river beds, while natural green belts were incorporated within the city's master plan.
- A large **green belt of mango trees** was also planted around the city to help reduce urban sprawl and to serve as a buffer between the residential city and the industrial suburbs.
- Local architecture such as **mud houses** within the region was considered as a template to build climate-responsive architecture.
- A **small rivulet was dammed** to create the **Sukhna lake**, to help cool the city, while small water bodies were developed near large buildings.
- **Parks** were planned out in every sector, along with tree plantations alongside all the major roads. **Large forest** areas were also reserved.

- Over time, such complementary urban design has been overlaid by **modern construction materials** and impacted by factors as varied as climate change and traffic congestion. However, the underlying design principles are applicable across Indian cities.

Conclusion

- India needs to improve its **forecasting ability**, including the potential impact of heat on food production.
- Current econometric models associated with food inflation primarily look at the variability in the monsoon, minimum support prices and vegetable prices. There is a need to add local heat trends to the mix as well, given the impact of heat on food production, storage and sale.
- **Detailed policies and guidelines on weather variability and urban heat management** at the State, district, city and municipality ward levels are needed.
- Policymakers must take mitigatory action early, while instituting structural infrastructure measures to help Indians adapt to these conditions.

14) The takeaways from the UN World Water Conference

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

Context

- The **World Water Conference** that was convened by the **United Nations** recently was the first UN conference on freshwater in almost 50 years.
- It was held in the context of serious environmental issues — **flooding, drought, severity of climate change** and a **looming food crisis**.

- The conference also marked a **mid-term review** of the **Water Action Decade 2018-2028** (to advance the water agenda by energising existing programmes and projects, and inspiring water action to achieve the **2030 Agenda**, in particular **Sustainable Development Goal 6** (SDG 6), which envisages the sustainable management of water and sanitation for all).

Outcomes

- The central outcome of the conference was the **International Water Action Agenda**, to which governments, multilateral institutions, businesses, and non-governmental organisations submitted over **670 commitments** to address water security issues.
- Nearly **164 governments and 75 multilateral organisations** have made commitments.
- While the commitments embodied in the Water Action Agenda are **voluntary** and, therefore, legally **non-binding**, the voluntary commitments are expected to **inspire the collective political will**, which is needed to address the many water challenges.

Poor finances, poor water services

- The commitments made at the conference must be scrutinised to see whether they will **yield universal, safe, affordable and equitable access to water** that is consistent with **SDG 6**.
- Meeting this target by **2030** (as envisioned by the SDG) will incur capital expenditures of **\$114 billion** per year.
- The **World Bank** estimates recurring operations and maintenance for **basic water and sanitation service (WASH)** costs to rise from about \$4 billion to over **\$30 billion per year by 2030**,

which is far more than the capital costs for basic WASH services.

- The **World Resources Institute (WRI)** is of the view that the commitments made by the states reflected rigour, scope, and ambition but they **lacked proper finance and targets** that are quantifiable in nature.
- Investment of this range would require valuing water, which in turn requires robust water measurement and accounting.
- There are **serious limitations in our knowledge** about the volume, flux and quality of water in lakes, rivers, soils and aquifers.
- There are **huge gaps in water usage data**. The metering of water has triggered resistance from India to Ireland because of concerns about equitable access and affordability of water services.
- The **Global Environment Facility (GEF)** is the only international funding mechanism that has been able to cover **more than 300 watersheds** and an even greater number of aquifers across the political boundaries of two or more states with its grant and concessional loan.

India at the conference

- India's commitments at the conference were: an **investment of \$240 billion in the water sector and efforts to restore groundwater level**.
- A **2021 CAG report** says that **groundwater extraction** in India increased from **58% to 63%** between 2004-17.
- The revised **Groundwater Bill 2017** vests State groundwater boards with creating laws, managing water allocation and other relevant issues.
- The State boards are **understaffed**, and **lack in expertise** and

prioritising socio-political conflicts over groundwater resources.

Conclusion

- **Voluntary commitments** are becoming an important feature in the environmental law vista, but they raise **difficult issues of accountability**.
- Commitments made by the states with different formats and with different content pose challenges in terms of monitoring compliance with each commitment.
- Voluntary commitments are perhaps just a **necessary step in the face of inaction**.

15) Time to put a price on carbon emissions

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

Context

- In the **absence of a price for the use of natural resources** such as air and forests, **environmental destruction** has been part of every country's recipe for boosting GDP growth.
- But the consequence of this approach has been the **relentless emission of carbon**, causing runaway climate change.
- It is time, starting with the biggest economies of the G-20, to agree on **valuing nature, including by pricing carbon effluents**.
- India can take the lead, as president of the G-20 this year, in carbon pricing, which will **open unexpected avenues of decarbonisation**.

Ways of pricing

- **Three ways of pricing carbon** are: the establishment of a **carbon tax domestically**, as in Korea and Singapore; the use of an **emissions trading system (ETS)**, as in the European Union (EU) and China;

and the application of an **import tariff on the carbon content**, as the EU is proposing.

- Some **46 countries** price carbon, although covering only **30% of global greenhouse gas (GHG)** emissions, and at an average price of only **\$6 a ton of carbon**, a fraction of the estimated harm from the pollution.
- The **International Monetary Fund** has proposed price floors of \$75, \$50, and \$25 a ton of carbon for the United States, China, and India, respectively. It believes this could help achieve a **23% reduction in global emissions by 2030**.
- The **economy-wide benefits** of carbon pricing in terms of damages avoided (plus revenue generation) generally **outweighed the cost** it imposed on individual industries in the EU, British Columbia, Canada, and Sweden.
- A key dynamic is that carbon pricing, by signalling a price for cleaner air, makes investment in renewable energy such as solar and wind, which has huge prospects in India, more attractive.

Impact on India

- Among the three ways of pricing, India could find a **carbon tax appealing** as it can directly **discourage fossil fuels**, while raising revenues which can be invested in cleaner sources of energy or used to protect vulnerable consumers.
- It could **replace** the more inefficient scheme of **petroleum taxes** which are not directly aimed at emissions.
- In most countries, including India, **fiscal policy** has set in place the **basic structures** needed to implement a **carbon tax**. For example, they can be woven into **road-fuel taxes**, which are

established in most places, and extended to industry and agriculture. Policymakers have to choose the tax rate, which varies widely from Japan's \$2.65 a ton of CO₂ to Denmark's \$165 a ton set for 2030.

- **India** could start with the **IMF figure of \$25 a ton**. The main obstacle is the argument by industrial firms about **losing their competitive advantage** to exporters from countries with a lower carbon price.
- It would stand to reason, therefore, for all high, middle and low-income countries to set the same rate within each bracket.
- It might also make sense to allow companies to use **high-quality international carbon credits to offset up to a certain percentage of their taxable emissions**.
- The EU **excludes transport**, where higher costs would have been passed on to consumers directly, Singapore provides **vouchers** for consumers hit by utility price rise, and California uses proceeds from the sales of carbon permits partly to **subsidise purchases of electric cars**.

Communication is important

- Any type of carbon pricing faces **stiff political opposition**.
- Communicating the idea of wins at the societal level, even in the presence of some individual producers' losses, is vital.

Conclusion

- A high enough carbon tax across China, the U.S., India, Russia, and Japan alone (more than 60% of global effluents), with complementary actions, could have a notable effect on global effluents and warming.

- It could also pave the way to **seeing decarbonisation as a winning development formula**.
- As carbon pricing gains acceptance, the **first movers** will be the **most competitive**.
- India, as president at the G-20 summit this September, can play a lead role by tabling **global carbon pricing** in the existential fight against climate change.

16) INCUBATORS-THE GROWTH ENABLERS

(GS3: Indian Economy and issues relating to Planning, Mobilization of Resources, Growth, Development and Employment)

What is an Incubator?

- Business incubators are organisations that assist entrepreneurs in developing their businesses, particularly in the early stages.
- These are organisations dedicated to accelerating the growth and success of startups and early-stage businesses.

What is Atal Innovation Mission (AIM)?

- AIM is a flagship initiative of NITI Aayog to promote a **culture of innovation and entrepreneurship**.
- It is an umbrella structure tasked with promoting innovation and revolutionising the country's entrepreneurial ecosystem.
- It creates new policies and programmes to promote innovation in various sectors of the economy, as well as providing a platform and opportunities for collaboration to various stakeholders in the entrepreneurial space.

What is Atal Incubation Centre?

- AIM intends to assist in the establishment of **new greenfield incubation centres** known as **Atal Incubation Centres (AICs)**, which

will nurture innovative startups in their pursuit of becoming scalable and sustainable business enterprises.

- AIM will assist these AICs in developing world-class incubation facilities across the country by providing state-of-the-art physical infrastructure, capital equipment, and operating facilities to their incubatee startups, as well as the availability of sectoral experts for mentoring.
- In addition, **business planning assistance, access to seed capital, industry partnerships, training, and other relevant components** supporting innovative startups will be provided.
- Furthermore, the majority of AICs established would be **sector-specific** in areas such as manufacturing, transportation, energy, health, education, agriculture, water, sanitation, Internet of Things, Cyber Security, and so on, in order to foster unprecedented technological innovation in specific sectors.

What is Established Incubation Centre?

- In recent years academia, industry, investors, entrepreneurs, Government organisations, and Non Governmental Organisations have taken the initiative to set up incubation centres across the country.
- These are **brownfield established startup incubators, who need to be supported to augment, enhance and upgrade** their incubation capacity manifold and develop a conducive ecosystem by strengthening linkages among these incubation centres, universities, and corporates.
- AIM envisages to invigorate these **Established Incubation Centres (EICs)** in the country through the

provision of **financial scale-up support**. These EICs would support innovative and high growth startups and help in developing a vibrant entrepreneurial ecosystem in the country.

What is the MAARG portal?

- The **Department for Promotion of Industry and Internal Trade (DPIIT)** launched **startup registration** on the **MAARG portal (Mentorship, Advisory, Assistance, Resilience, and Growth)** in 2022.
- The MAARG portal is a **one-stop shop for startups of all sectors, functions, stages, geographies, and backgrounds**.
- The application's goal is to further boost the startup ecosystem in India by catalysing the startup culture and creating a strong and inclusive ecosystem for innovation and entrepreneurship.

17) Startup India Programme

(GS3: Indian Economy and issues relating to Planning, Mobilization of Resources, Growth, Development and Employment)

Context

- The Startup India programme was launched in 2016 with the objective of **promoting entrepreneurship and creating job opportunities** for the youth of India.
- The initiative aims to create a **robust ecosystem for startups, including incubators, accelerators, and funding agencies**.

Components

- The Startup India initiative has **three main components**:
 - **simplification and handholding,**
 - **funding support and incentives, and**

- **industry-academia partnership and incubation.**
- Under the simplification and handholding component, the government has **simplified the process of starting a business** in India by reducing the time and cost required to start a business.
- The funding support and incentives component provides **various incentives for startups**, including tax benefits, patent registration, and funding support.
- The industry-academia partnership and incubation component focuses on **creating a network of incubators and accelerators** across the country, which can provide mentoring, networking, and funding support to startups.

Impact on the Indian Economy

- **India is the third-largest startup ecosystem** in the world. The Startup India initiative has had a significant impact on the Indian economy, particularly in terms of **job creation and economic growth**.
- According to a report by NASSCOM, the Indian startup ecosystem is expected to create **12-15 million direct jobs by 2025**.
- The initiative has also attracted **significant foreign investment**, with the total funding raised by Indian startups increasing from \$3.9 billion in 2014 to **\$14.5 billion** in 2019.
- The initiative has also encouraged the **growth of innovation and entrepreneurship** in India. According to the **Global Innovation Index**, India's rank in innovation has improved from 81st in 2015 to **48th in 2021**.
- The initiative has also encouraged the **growth of startups in various**

sectors, including technology, healthcare, and agriculture.

Challenges and Limitations

- Despite the significant impact of the Startup India initiative, it faces several challenges and limitations. One of the main challenges is the **lack of access to funding for startups**, particularly for **early-stage startups**.
- Another challenge is the **lack of skilled manpower** in the startup ecosystem. Many startups struggle to find skilled employees with relevant expertise and experience.
- Another limitation of the Startup India initiative is its **focus on technology startups**. Although technology startups have attracted significant funding and attention, **other sectors, such as healthcare, agriculture, and education still have untapped potential**.
- The initiative also faces several **legal challenges**. The **regulatory framework** for startups in India is **complex and often cumbersome**, making it difficult for startups to comply with the regulations.
- There is also a **lack of clarity on the definition** of a startup, which creates confusion and ambiguity in the regulatory framework.
- Additionally, there is a need to **strengthen the legal framework for intellectual property rights** to protect the innovations of startups.

Impacts on Marginalised Communities

- The Startup India initiative has provided various incentives and support to entrepreneurs, including those from marginalised communities. This had a **positive impact on the development of marginalised communities** in India.
- For instance, the **Stand-Up India scheme** provides **loans to women**

and SC/ST entrepreneurs to start new ventures.

- Similarly, the **National Handicapped Finance and Development Corporation** provides **financial assistance to people with disabilities** to start their businesses.
- According to a report by the **Ministry of Commerce and Industry**, the **number of women-led startups in India has increased by 50%** since the launch of the initiative.
- Similarly, the initiative has helped in the **inclusion of SC/ST entrepreneurs in the mainstream economy**, who were previously excluded due to discrimination and lack of access to resources.

Shortcomings

- Despite these efforts, the impact of the Startup India initiative on the **development of marginalised communities in India has been limited.**
- The **majority of startups in India are concentrated in urban areas** and are led by people from **privileged backgrounds.**
- According to a report by **Oxfam India**, **only 17% of startups in India are founded by women, and less than 1% are founded by people with disabilities.**
- Similarly, **startups in sectors such as healthcare and education are mostly focused on urban areas** and serve the needs of the affluent population.

Conclusion

- The Startup India initiative has been successful in promoting entrepreneurship and innovation in the country. The initiative has created a conducive ecosystem for the growth of startups by providing them with access to funding,

mentorship, and other support services.

- However, the initiative also faces several legal challenges, such as the complex regulatory framework and the lack of clarity on the definition of a startup.
- There is a need for a **more targeted and comprehensive approach to promoting entrepreneurship among marginalised communities** in India. This approach should **address the structural challenges** and provide **adequate support and incentives** to promote the growth of startups in marginalised communities.

18) Women Empowerment through PRIs

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

Context

- The **73rd Constitutional Amendment Act** reserved **one-third of all seats in Panchayats** for women. As a result, a large number of women were elected as members and chairpersons of Panchayats.
- At national level **women as Members and Presidents of Panchayats are about 46 per cent** of total elected representatives. In some of the States, their **share is more than 50 per cent.**

Women Participation in Panchayats: An Assessment

- The **Ministry of Panchayati Raj (MoPR)** conducted a nationwide study entitled **"Study on Elected Women Representatives in Panchayati Raj Institutions"** in 2008 covering 23 States in the country.

- The study analysed **different dimensions of elected women representatives' vis-à-vis their male counterparts**, track record of their political careers over the past three rounds of elections. The main findings of the study are given below:
- In terms of social groups, a **large number were from more marginalized groups of society**.
- **Twenty per cent were illiterate**, but the **gender gap was significant** (women-24% ; men-6%). Economically, **Pradhans** (president of Gram Panchayat) had a **better economic status**.
- **Reservation facilitated the first entry into politics for 83 per cent of women elected representatives**.
- Overall, the **quality of participation of women** assessed across various dimensions turned out to be **reasonably good**. As many as **86 per cent of female presidents of Panchayats reported executing the important role of being a local Panchayati Raj functionary**.

Impact of Participation of Women

- Women participation in PRIs impacted them positively as **79 per cent** of women representatives realised **enhancement in their self-esteem**, **81 per cent** perceived **enhancement of confidence** and **74 per cent** realised their **enhanced capacity in decision-making ability**, **67 per cent** women opined that after becoming elected representatives of Panchayats their **respect has been enhanced within family** and **82 per cent women** opined **enhanced their respect in community**.
- As many as **72 per cent** have reported that they have been actively involved in **providing civic**

amenities and a quite significant number (**62%**) made efforts in **enhancing enrolment of children in schools and reducing domestic violence** in the villages.

Main Recommendations of the Study are Given Below

- **Enhancement of educational levels** of elected representatives,
- **Encouragement of joining of younger women** in politics,
- **Imparting relevant training and capacity building** regularly, covering multiple dimensions including rules and regulations, administrative issues, budgeting and finance and the implementation of development schemes,
- **Giving adequate honoraria**,
- **Association of women in various groups** including Self-help groups and committees for increasing their visibility in villages.
- Other studies have revealed that **women invested more in infrastructure relevant for rural women's needs** like water, fuel, roads while their counterparts invested more in **education**.
- Another empirical study showed that **villagers are less likely to pay bribes** in Gram Panchayats with the office of chairperson reserved for women.
- Studies show that **greater female representation** in the local level government system has ensured **reporting of crime against women at a greater number**.

The Task Ahead

- The MoPR has brought out the **roadmap for the Panchayati Raj (2011-17) - An All India Perspective**, in which a number of steps are suggested for **empowerment of women**.
- These are given below.

- **Linkages with SHGs** in all levels of PRIS.
- **Leadership training programmes** for elected women representatives.
- **Peer-to-peer and horizontal learning** from success stories.
- **Sharing good practices and exposure visits.**
- **Mahila Sabhas** may be encouraged to facilitate women's concerns and be raised on priority basis in meetings of Gram/Ward Sabhas.
- **Separate quorum for women participation** in Gram/Ward Sabha.
- Besides these, the following are also some important suggestions for **effective participation of women in Panchayats.**
 - **Mobilisation of women into their own collectives** for better outcomes. The **Kudumbashree network in Kerala** provides a successful example in this regard.
 - **Devolution of powers and authority** to Institution of self-government.
 - **Reservation for women in services.**

Conclusion

- The Constitution has enabled women to be instrumental in deepening decentralised governance through PRIs.
- Studies revealed that women have contributed positively in the delivery of goods and services to masses. They could play their role in a more effective way, if the suggestions given in the paper may be put into practice.
- Panchayats should function as institutions of self-government

meaning thereby that they at least **enjoy triple Fs** (clearly defined **functions**, adequate **funds** and sufficient **functionaries**) at their level.

19) Good Governance at Grass-root Level

(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

- Panchayati Raj Institutions (PRIs) in its modern avatar was introduced in India through the **73rd Constitutional Amendment Act, 1992** to build **democracy at the grassroots level**. But, roots of this model of governance can be traced back to many centuries in Indian history.

Evolution

- As far back as in **Rig Veda, Sabha, Samiti and Vidatha** were mentioned as the units of local self-units. As per the details of these powerful units, the **contemporary kings needed to take approval** from these units in many instances.
- In **Ramayan**, the village level unit of governance used to be called as **Janpad**, while there used to be a **caste panchayat** all across the kingdom each of them was represented in the council of ministers in the king's court by one elected person.
- In later periods, '**Shanti Parva**' in **Mahabharata, Manu Smriti** and **Kautilya's Arthshastra** also had references of **rural units of governance** in contemporary times.
- The history of rural governance in India remained **strong** in almost all the time periods **till around 5th**

century AD when the Gupta dynasty fell down.

- Central power system weakened and so did the local system of governance. Later in dynasties like **Delhi Sultanate, Mughal empire**, the rural governance system was **reinstated to some extent**.

Panchayati Raj in British India

- Panchayati Raj Institutions found their modern form mostly in British Raj when in **1870 Mayo resolution** was brought into. Through this resolution, local institutions were **bestowed with more power** and their **scope of functioning was also enhanced**.
- The Mayo resolution was in fact, promulgated as a **result of the first independence war of 1857**. The objective was to **decentralise the taxation system to grass root levels**.
- Mayo resolution was followed up by **democratic framework** of these institutions through **Lord Rippon's laws in 1882**.
- Then in **1907**, for the first time in British India, the need of panchayats on village level was recognised by a **Royal Commission** chaired by **CEH Hobhouse**.
- **Mahatma Gandhi** was a fierce proponent of the **idea of Panchayati Raj**. He strongly pleaded for **decentralisation of powers**.
- But, there were many counter views also. **Dr. B. R. Ambedkar** himself was **opposed to the idea of panchayati raj**. He believed that the villages represented **regressive India**, a source of **oppression**. He argued against panchayats as he was apprehensive about the **continuation of caste hegemony**.

- As a result of these debates, panchayats **could find a mention only in Article 40** of the Directive Principles State Policy of the Constitution initially.

Panchayati Raj in Independent India

- The **Balwant Rai Mehta**, constituted in 1957, recommended the formation of **3-tier Panchayati Raj Institutions (PRI)** - **Gram Panchayat** at village level, **Panchayat Samiti** at the block level, and **Zilla Parishad** at the district level.
- Later **73rd and 74th Constitutional Amendments** together paved the way of local self-governance in rural and urban India. The 73rd Amendment actually added **Part IX** titled "**The Panchayats**".

Panchayati Raj : A tool for Empowering Weaker Sections

- PRIs have played a significant role in the **political empowerment of women**. The 73rd and 74th Amendments required that **no less than one-third of the total seats in local bodies should be reserved for women**. At 1.4 million, **India has the most women in elected positions**.
- Along with women, it has also been playing an important role in **strengthening weaker social groups like ST/ST and OBC**. Seats and sarpanch/pradhan positions are **reserved** for SC/ ST and OBC candidates. By giving representation to these deprived sections of society, PRIs have **cemented the foundation of Indian democracy**.

Governance by People for People

- Gram Panchayat Institutions are the **primary entities** which take care of **all the basic needs of the public**.

- PRIs have **3 sources of funding: grants** received from the local bodies, funds from the **centrally-sponsored schemes** and funds received by the **state governments** on the advice of State Finance Commissions.
- There are **two categories of work** that PRIs are supposed to do. One is the **mandatory category** and the other is **optional**. Optional set of work depends upon the **available resources** with a PRI.
- Here are some works that are **optional** for panchayati raj: establishment of reproduction centers for animals, promoting agriculture, plantation alongside the roads, welfare of newborn and mother etc.
- Under the **mandatory category** comes the following set of works: primary health, construction of public wells, construction of public toilets, social health and primary and adult education, vaccination, irrigation, supply of potable water, rural electrification, hygiene, maintenance of public pathways etc.
- **Village panchayats** make **plans of development** with people's participation. These plans are placed together with similar plans prepared by the intermediate and district panchayats.

Government Initiatives

- Acknowledging the crucial role Panchayati Raj Institutions can play in the implementation of successful and good governance, the Government of India has launched several schemes aimed at strengthening and empowering Panchayati Raj institutions in the country.

1. Gram Panchayat Development Plan (GPDP):

- A **special campaign** called "**Gram Panchayat Development Plan**" was launched with a mandate to prepare the Panchayat Development Plan for economic development and social justice utilising the resources available to them.
- The GPDP should be **comprehensive** and based on **participatory process** involving the community particularly Gram Sabha, and will be in **convergence with schemes** of all related Central Ministries / Line Departments related to 29 subjects listed in the Eleventh Schedule of the Constitution.
- This **Ministry of Finance** took the initiative of preparing **model guidelines for GPDP** and circulated the same to all the States where part IX of Constitution is applicable. Based upon these model guidelines, all the states notified their **State specific guidelines** for GPDP.

2. Rashtriya Gram Swaraj Abhiyan (RGSA):

- With an objective to bring **people propelled development at the ground level**, the government has launched Rashtriya Gram Swaraj Abhiyan that aims to **quickly and effectively transform selected districts** in 2018.
- These districts were selected on **parameters like poverty, public health, nutrition, education, gender, sanitation, drinking water, livelihood generation** which are in sync with Social Development Goals (SDGs) and fall within the realm of Panchayats.
- RGSA enables Panchayats to function effectively to achieve SDGs and other development objectives that require significant Capacity building efforts.

3. SVAMITVA (Survey of Villages And Mapping with Improved Technology in Village Areas):

- On **Panchayati Raj Diwas** (April 24th) in 2020, the government launched 'SVAMITVA Yojana' to **map residential land** in the rural sector using modern technology like the use of drones.
- The scheme aims to **revolutionise property record maintenance** in India. It aims to provide rural people with the **right to document their residential properties** so that they can use their property for economic purposes.

4. e-Panchayat:

- The e-Panchayat scheme aims to bring **transparency and efficiency to the functioning of Panchayati Raj institutions** through the use of technology.
- It provides a **platform for online reporting, monitoring, and management of Panchayat activities**.

5. Deen Dayal Upadhyay Panchayat Sashaktikaran Yojana (DDUPSY):

- The DDUPSY scheme was launched in 2014 to **strengthen Panchayati Raj institutions** by providing them with the **necessary resources and capabilities** to undertake their constitutional duties.

6. Swachh Bharat Abhiyan:

- The Swachh Bharat Abhiyan, launched in 2014, aims to **make India clean and open-defecation free**.
- The scheme focuses on creating a **culture of cleanliness and promoting the use of toilets** in rural areas.
- **Panchayati Raj institutions** play a crucial role in the implementation of the scheme at the grassroots level.

7. Common Service Centers (CSCs):

- The primary objective of CSC is to act as **single access points for delivery of all digital services** in Gram Panchayats and to generate opportunities of employment by promoting rural entrepreneurship.

8. e-Governance and ICT Initiatives:

- In order to strengthen e-Governance in the PRIs, a Simplified Work Based Accounting Application, **e-Gram SWARAJ** was launched in 2020.
- To ensure better financial management of Panchayats for enhancing transparency and accountability in maintenance of accounts, the government has **integrated e-GramSwaraj** with the **Public Financial Management System (PFMS)**.
- **e-GramSwaraj PFMS Interface (eGSPI)** is one of its kind for Gram Panchayats to make **real time payments to vendors/service providers**. All transactions are **secured** and payment vouchers are created using **2 factor authentications**.
- Now, the e-Gram SWARAJ is also being **integrated with Government e-Marketplace (GeM)** to enable **seamless procurement and accounting experience to the Panchayats**.
- **AuditOnline Application** has been developed to allow **online audit of Panchayat accounts** and to enhance transparency and accountability in audit.

Conclusion

- With the help of these schemes PRIs aims at strengthening the Panchayati Raj system in India and empowering local communities to participate in the development process to achieve the constitutional goal of successful governance at grass-root level.

Model Questions

1. Despite various government measures to reduce urea consumption, its consumption increases due to overuse from underpricing. Discuss.
2. World's population is projected to witness a declining trend by 2100 which poses numerous challenges. Discuss and suggest a way forward.
3. In the light of the recently launched National Quantum Mission, enumerate the challenges associated with quantum computing and explain how that can be addressed?
4. Out Of Pocket Expenditure continues to be a hindrance in improving the health status of India. How do you think that it can be brought down considerably?
5. What are single use plastics? How effective is the ban on single use plastics? What is the reason for its failure?
6. It's high time for India to decommission its old dams to avert dam related disasters. Discuss.
7. Widespread adoption of generative artificial intelligence (AI) has its own advantages and disadvantages. Comment.
8. Taking appropriate measures to realize India's fishing potential can also put an end to the long standing Indo-Sri Lankan dispute over fishing rights in the Palk strait. Discuss.
9. Analyze the causes and effects of heavy metal pollution in rivers in light of the recent increase in toxicants reported in the Nile River basin.
10. "Debt for climate swaps serves advantageous to developing nations". Critically Analyse.
11. What is meant by a marine protected area? How do they aid in biodiversity conservation?
12. "In recent times FPOs seem to be gaining prominence". What are the challenges faced by FPOs in the country?
13. Heat waves are affecting all over India. Discuss the steps to mitigate it in the long run.
14. Sustainable Development Goal 6 focuses on equitable access of water to all. In the above context, discuss India's role in the equitable access of water to all with existing challenges present in the current scenario.
15. Is global carbon pricing the need of the hour? Analyse India's g20 leadership in implementing the same.
16. Discuss how Atal Innovation Mission is promoting a culture of innovation and entrepreneurship in the country.

17. Discuss the challenges and limitations faced by Startups in India and suggest measures to address the same.
18. "The reservation of seats for women in the institution of the local self-government has had a limited impact on the patriarchal character of the Indian political process". Comment.
19. Assess the importance of the Panchayat system in India as a part of local government.