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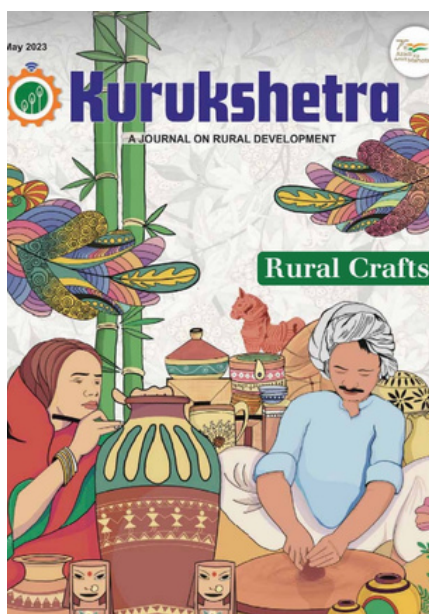
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Contents

1) Transforming Technology

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

Context

- Quantum computing differs from traditional computing, which uses **'bits'** - binary digits of 0s and 1s - to **represent information**. However, quantum computing uses **quantum bits**, or **'qubits',** which can exist in multiple states simultaneously, instead of just two states (i.e., 0 and 1).
- This property of qubits, known as **superposition** allows quantum computers to perform many computational calculations orders of magnitude faster than classical computing
- Further quantum computing also borrows inspiration from another property of quantum mechanics called **entanglement** wherein two qubits could be connected in such a way that the state of one qubit intrinsically affects the state of the other qubit.

Future Potential

- Quantum computing is a relatively young domain, and while practical quantum computers are now commercially available, they are currently limited to performing very specific types of calculations.
- However, researchers believe that quantum computers have the potential to revolutionise fields such as **data sciences, artificial intelligence, and decision sciences.**

Impact of Quantum Computing

- **Faster data analysis in industrial data science applications**
- **Improved machine learning outcomes**
- **Improved optimisation for complex problems**
- **Improved Industrialisation**
- **Improved process efficiencies in digital transformation.**

Implications for practice and policy

- Quantum computing is an advanced area where research and development are still at a nascent stage. However, this presents an **opportunity for India to establish well-funded Research Centres of Excellence** in the leading technological institutions.
- **Long-term schemes of the Department of Science and Technology** could possibly be introduced whereby strategic infrastructure and manpower training projects can be funded in the established technology engineering institutions.
- Furthermore, quantum computing also needs **clear and sustained policy and governance** since it deals with new levels of data and computation. Frameworks surrounding **security, transparency, accountability, fairness, and ethical use of quantum computing systems** also need to evolve.
- The **skills of the existing workforce** need to be geared towards better understanding data science and decision science, so that they can take advantage of the wider quantum computing domain over the coming years.
- Quantum computing is a **global field** and **collaboration** is crucial for making progress. **International funding agencies** could develop **joint project funding schemes** whereby collaborations can be fastened to enable faster development in this space.

Conclusion

- The quantum computing domain is an area that the government must focus on because it will be heavily

dependent on exploiting information assets within and outside the organisations in the long-term.

- There is a significant opportunity for India to move towards that direction as it is envisioned that strategic investments in research, development, and training mechanisms should be created.
- This may enable improved capability for leveraging and exploiting this domain for the benefit of citizens and the nation going forward.

2) Leveraging Technology for Transforming Healthcare

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

Context

- Digital health refers to the **use of technology interventions** for providing healthcare solutions and empowering healthcare seekers and providers with a **focus on better quality, higher efficiency, and easy access to healthcare services.**
- The **global pandemic** gave a major push to the quick adoption of digital health innovations and mainstreamed digital health.

Significance of Digital health

- One of the major advantages of telemedicine is that it can **save time and efforts** especially for **rural patients**, who need not travel long distances for obtaining consultation and treatment. The population cohort, including **children, older adults, and individuals with disabilities,** also stands to benefit from e-health services.
- This is also accompanied by **reduced financial costs** associated with travel as travel for seeking

healthcare by marginalised and disadvantaged communities is often accompanied by loss of work hours, loss of wages, and lower productivity.

- As per a recent impact study by an NGO, **each tele-consultation at an Ayushman Bharat Health & Wellness centre saves an average of a journey of up to 21.58 km,** and **more than Rs 941 as Out-of-Pocket-Expenditure (OOPE) on healthcare.**
- Another significant driver of the digital health market is the **increasing prevalence of chronic diseases** such as diabetes, cardiovascular diseases, and cancer. Digital health solutions can help manage these diseases more effectively by providing **personalized care plans, monitoring patient health remotely, and improving patient engagement.**
- **Health apps** have helped in monitoring of health parameters, thereby aiding in **preventive and curative health.** This would eventually help to **reduce out-of-pocket expenditure** for treatment and also **reduce the burden on the country's health care infrastructure.**

Government Initiatives
eSanjeevani

- Launched by the **Ministry of Health & Family Welfare,** 'eSanjeevani' is a **web-based comprehensive telemedicine solution.** It aims to provide **healthcare services to patients in their homes.**
- Using eSanjeevani, specialist doctors are roped in to provide specialised support for delivering quality healthcare services to rural and hard-to-reach areas.

- This has elevated the quality of healthcare being provided to meet the goals of **Antyodaya - last mile delivery of quality services.**

Ayushman Bharat Digital Mission (ABDM)

- Ayushman Bharat Digital Mission envisions an **integrated digital health infrastructure** for the country and aims to develop the backbone that is necessary to support it. These **digital highways** will **bridge the existing gap** among different stakeholders of the healthcare ecosystem. The Government launched ABDM in 2021.
- ABDM proposes to create a **seamless online platform** through the provision of a wide-range of data, information and infrastructure duly leveraging open, interoperable, standards-based digital systems while ensuring the security, confidentiality and privacy of health-related personal information.
- The ABDM will eventually **connect the digital health solutions of hospitals across the country.** The digital ecosystem will also enable a host of other facilities, like digital consultation, consent of patients to let medical practitioners access their records, etc.
- An important part of ABDM is **ABHA (Ayushman Bharat Health Account).** The ABHA is a **14-digit number** that will **uniquely identify a beneficiary** as a participant in India's digital healthcare ecosystem. It will allow the users, insurance companies, and hospitals to access and share the health records digitally.

CoWIN

- The Covid Vaccine Intelligence Network (CoWIN) system was launched in 2021. It has provided the **technological backbone to India's Covid-19 vaccination programme,** which has administered more than 220 crore doses, so far.
- With COWIN, beneficiaries could book for Covid vaccination from any part of the country through a seamless network.

Tele-MANAS

- Telemental Health Assistance and Networking Across States (Tele-MANAS) initiative was launched in 2022 to provide **free telemental health services**, including counseling, integrated medical and psychosocial interventions through video consultations with mental health specialists, particularly to the remote areas and vulnerable groups of the population.
- The programme includes a network of 23 telemental health centers of excellence, with **NIMHANS** being the nodal centres and **International Institute of Information Technology-Bangalore (IIITB)** providing technology support.

Ni-kshay 2.0 Portal

- The President of India launched the **'Pradhan Mantri TB Mukt Bharat Abhiyan Ni-kshay 2.0'**, a **digital platform for community support for the persons diagnosed with tuberculosis**, in 2022.
- The purpose of this portal is to provide **technology backup for the Ni-kshay Scheme,** which aims to mobilise communities, stakeholders, elected representatives, corporates, NGOs, and individuals to come forward as donors to help the patients through additional diagnostic, nutritional, and vocational support.

Conclusion

- Technology-aided health interventions and digital solutions in healthcare have revolutionised the healthscape globally by bringing in unprecedented change.
- Digital health forms one of the key priorities of the G20 India Health Track. It will serve countries to collaborate and pool of knowledge and experience in developing and using innovative technologies aimed at serving people with enhanced care, efficiency, and quality.

3) A boost for science, a wider window to the universe

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

Context

- The **United States National Science Foundation** is partnering with top U.S. universities and India's Raja Ramanna Centre for Advanced Technology, or **RRCAT (a unit of Department of Atomic Energy,** Government of India) to launch LIGO-India, a ground-breaking collaboration, fuelled by a $320 million investment from India, that will accelerate discovery and innovation in India and around the world.

About LIGO

- LIGO stands for "**Laser Interferometer Gravitational-wave Observatory**", the **world's largest gravitational wave observatory.**
- LIGO is a scientific collaboration of **two widely-separated interferometers** within the United States—one in Hanford, Washington and the other in Livingston, Louisiana—**operated in unison to detect gravitational waves.**

- LIGO exploits the physical properties of light and of space itself to **detect and understand the origins of gravitational waves (GW)** predicted by Einstein's General Theory of Relativity.
- LIGO uses **lasers to detect ripples** in space-time through a method called **interferometry**: as gravitational waves pass by, they cause space itself to stretch and squeeze, which scientists can measure through changes in the beams of the LIGO lasers.
- LIGO's interferometers can amplify the smallest conceivable vibrations enough that they are detectable and measurable.

Significance of LIGO

- The data LIGO collects have far-reaching implications in many areas of physics.
- LIGO has provided **new clues about merging black holes**, the **existence of neutron stars and the origin of the universe.**
- It has opened an entirely new way of observing the universe.

Detection of gravitational waves

- **Colossal events** in the distant universe such as merging of black holes, explosion of supernovae and collision of neutron stars create **cosmic ripples in space-time** called **gravitational waves.**
- LIGO made its first detection of gravitational waves (in **2015**), generated by a pair of **colliding**

black holes some 1.3 billion light years away.

- Following the 2015 detection, which later won the Physics Nobel (2017), the two LIGO detectors detected seven such binary black hole merger events before they were joined by the **European Virgo detector** in 2017. The two facilities have now detected 10 events.
- The **Japanese detector, KAGRA**, or **Kamioka Gravitational-wave Detector**, is expected to join the international network soon.

About LIGO-India Project
- LIGO-India is a **scientific collaboration with LIGO and lead institutes** to set up a **gravitational wave detector** in **Maharashtra's Hingoli district.**
- LIGO-India is a collaboration between the LIGO Laboratory and India's RRCAT, the Institute for Plasma Research (IPR), the Inter-University Centre for Astronomy and Astrophysics (IUCAA), and the Department of Atomic Energy Directorate of Construction, Services and Estate Management (DCSEM).

Significance of LIGO-India Project
- **LIGO-India** will create new opportunities by being a resource for students, researchers, and educators throughout local communities
- It can create **jobs across the technical workforce**, unleash **new avenues for scientific talent** and inspire the next generation of science, technology, engineering, and mathematics **(STEM) leaders.**
- By **joining the global network,** i.e., the **two LIGO detectors in the U.S., Virgo** in Italy, and the **Kamioka Gravitational-wave Detector (KAGRA)** in Japan,

LIGO-India will push forward the boundaries of what science and technology can achieve and help unlock some of the universe's greatest mysteries.
- The construction of LIGO-India is a **major milestone for gravitational wave science.**
- The observatory will help to answer some of the most fundamental questions about the cosmos.

4) Cure and not decriminalize drug users
(GS2: Issues relating to Poverty and Hunger)
Context
- This article highlights the **need for advancing health care services** for drug users rather than criminalizing them.

Cannabis and its usage in India
- **Cannabis** is a generic term used to denote the several psychoactive preparations of the plant **Cannabis sativa.** The main active chemical in cannabis is **THC (delta-9 tetrahydrocannabinol).**
- The Mexican term **'marijuana'** is frequently used in referring to **cannabis leaves or other crude plant material** in many countries.
- Cannabis is by far the **most widely cultivated, trafficked and abused illicit drug.**
- **Uttarakhand** became the first State in the country to **legalize cannabis cultivation** in 2017. Other States such as **Arunachal Pradesh, Gujarat, Madhya Pradesh and Uttar Pradesh have legalized cultivation** and harvest of cannabis for medicinal purposes. Himachal Pradesh is considering legalizing the cultivation of cannabis.
- **Health effects of cannabis use**

- o Cannabis **impairs cognitive development** (capabilities of learning) including associative processes.
  - o Cannabis **impairs psychomotor performance** in a wide variety of tasks, such as motor coordination, divided attention, and operative tasks of many types.
  - o Heavy cannabis consumption is associated with a **higher prevalence of symptoms of chronic bronchitis.**
- **Therapeutic uses of cannabinoids**
  - o Therapeutic effects of cannabinoids include its **usage for nausea and vomiting** in the **advanced stages of illnesses such as cancer and AIDS.**
  - o **Treatment of asthma, glaucoma** and as an **antidepressant, appetite stimulant etc**
  - o **Oil extracted** from cannabis is known to be useful in **strengthening nerves and treating people suffering from paralysis.**

NDPS Act and criminalisation of drug users

- The production, manufacturing, possession, consumption, sale, purchase, transport and use of cannabis is prohibited and **criminalized by the Narcotic Drugs and Psychotropic Substances (NDPS) Act 1985.**
- The 2001 amendment to the law differentiates between those who possess a **"small quantity"** of the drug (drug users) and those found

storing it in **"commercial quantities".** (drug traffickers).
- However, **possession of the drug (for personal consumption)** or **consuming it for recreational purposes remains an offense** under the Act.
- Criminalisation was intended to **deter the use of drugs**. However, **drug dependence has increased** over the years across the world.
- In India, 3.1 crore people are reported to have used a cannabis product in the last 12 months and about 72 lakh people required help to address their cannabis dependency-related problems.

Adverse effects of criminalisation

- Criminalisation means **long pretrial imprisonment and stigmatization of users.**
- Majority of the undertrial prisoners under the NDPS Act who end up in jail often belong to the **socially and economically vulnerable classes.**
- Putting drug users behind bars makes their **rehabilitation difficult** and exposes them to the **risk of becoming traffickers.**
- They **lack access to de-addiction centers.**
- The over-criminalisation of drug users **undermines their social well-being.**
- It also **overburdens the criminal justice machinery** and **adds to the workload of the overworked investigating agencies.**
- It **results in wastage of Public resources** which would otherwise have been deployed to set up a robust rehabilitation network.

Measures to decriminalize drug users

- In 2021, the **Ministry of Social Justice and Empowerment** recommended the

decriminalization of the possession of small quantities of drugs for personal consumption to **treat drug consumers as victims rather than culprits.**

- The Ministry also suggested **mandatory de-addiction and rehab facility** for 30 days followed by mandatory community service for one year for drug addicts.
- However, in Parliament last year, the government reversed its opinion on decriminalizing personal consumption of drugs.

Way Forward

- **Focus on public health approach**
    - Law enforcement agencies view drug users as offenders, whereas the public health systems focus on their well-being. However in India the rehabilitation of drug users is systematically replaced by the **denial of bail and enforcement of jail terms and penalties.**
    - It's high time for India to take lessons from countries such as **Portugal and Canada** that have demonstrated the efficacy of the public health approach.
- **Adopt Sikkim model**
    - In India, Sikkim has tried to tackle the drug problem by **differentiating between peddlers and consumers.**
    - It has tried to advance healthcare services to the most vulnerable drug users.
    - The state's model of decriminalization can be

replicated at the national level.

5) A ground view of the Indian Space Policy 2023
(GS3: Achievements of Indians in Science & Technology; Indigenization of Technology and Developing New Technology)

Context

- This article highlights the provisions of the recently released Indian Space Policy 2023 by the Indian Space Research Organisation (ISRO) and the gaps in it.

Evolution and potential of India's space industry

- **Until the early 1990s:**
    - **First space age** where India's space industry and space economy were defined by ISRO.
    - **Private sector involvement was limited** to building to ISRO designs and specifications.
- **From the late 1990's:**
    - The **Second Space Age** began with the licensing of private TV channels, the explosive growth of the Internet, mobile telephony, and the emergence of the smartphone.
- **Current scenario**
    - **India's space economy is over $9.6 billion** with ISRO's budget of $1.6 billion.
    - Broadband, OTT and 5G promise a double-digit annual growth in satellite-based services.
    - The Indian space industry could **grow to $60 billion by 2030** with an enabling environment.

Various policies related to space sector

- The **first satellite communication policy** was introduced in 1997, with guidelines for **foreign direct investment (FDI)** in the satellite industry that were further liberalised but never generated much enthusiasm.
- A **remote sensing data policy** was introduced in **2001**; in **2016**, it was replaced by a **National Geospatial Policy** that has been further liberalised in 2022. However these have not yielded the much needed results.
- For instance,
  - Indian users spend nearly a billion dollars annually to **procure earth observation data and imagery from foreign sources.**
  - More than half the transponders beaming TV signals into Indian homes are **hosted on foreign satellites,** resulting in an annual outflow of over half a billion dollars

How different is Indian Space Policy 2023 from the previous efforts?

- It recognises the **private sector as a critical stakeholder** in the entire value chain of the space economy.
- It clearly emphasizes its focus on **civilian and peaceful exploration of outer space**, stimulation of public awareness and scientific quest.

Private sector participation

- The policy seeks to **institutionalize the private sector participation** in the space sector, with ISRO focusing on research and development of advanced space technologies.
- The private sector is allowed to undertake **end-to-end activities in the space sector** through establishment and operation of space objects, ground-based assets and related services, such as communication, remote sensing, navigation, etc
- They can **design and operate launch vehicles** for space transportation and establish their own infrastructure.
- They can now make filings with the International Telecommunication Union (ITU) and engage in commercial recovery of asteroid resources.

Defined Roles and responsibilities

The policy lays out a strategy and then spells out the roles of the

- **Department of Space, ISRO**
  - ISRO shall **focus on R&D in advanced technology** and share technologies, products, processes and best practices with NGEs (non-government entities) and/or Government companies
- **Indian National Space Promotion and Authorisation Centre (IN-SPACe)**
  - IN-SPACe setup in 2020 will act as the **single window agency for authorizing space activities by government entities and NGEs.**
  - IN-SPACe is expected to create a stable and predictable regulatory framework that will ensure a level playing field for the NGEs.
  - It will act as a promoter by setting up industry clusters and as the regulator, issue guidelines on liability issues.
- **NewSpace India Limited (NSIL),**

- NSIL is a **public sector unit** setup in 2019 under the **Department of Space** as the **commercial arm of ISRO** to replace the now defunct **Antrix.**
- NSIL will become the **interface for interacting with the industry,** undertake commercial negotiations and provide hand-holding support to ensure smooth and efficient transfer of technologies.

Gaps in the Policy
- **Lack of time frame:** There is no timeline for ISRO's transitioning out of its current practices (manufacturing of operational space systems) or a schedule for IN-SPACe to create the regulatory framework.
- **Lack of statutory authority for IN-SPACe:** The position of IN-SPACe is ambiguous as it functions under the purview of the Department of Space.
- The policy also lacks clear rules and regulations pertaining to many.

Way Forward
- The policy framework envisaged will need clear rules and regulations pertaining to FDI and licensing, government procurement to sustain the new space start-ups, liability in case of violations and an appellate framework for dispute settlement.
- A statutory body for **IN-SPACe has to be created.**

6) Buddhism, India's soft power projection tool
(GS2: India and its Neighborhood-Relations)
Context:

- India recently hosted a **global Buddhist summit** in New Delhi which served as a significant opportunity for **India to project and connect with the Buddhist population** around the world, thereby strengthening the country's soft power.

India's relationship with Buddhism
- With its strong historical and cultural ties to Buddhism, India is well-positioned to play a **leading role in shaping the discourse around Buddhist issues** on the global stage.
- The Indian government has been actively investing in its Buddhist diplomacy efforts, with a focus on promoting tourism through the **development of the "Buddhist tourist circuit".**
- By laying an emphasis on **cultural and civilisational ties through Panchamrit principles** (guiding principles of India's foreign policy), India seeks to promote greater understanding and cooperation between nations and to demonstrate the unique role it can play in shaping the region's future.

Buddhism- a soft power tool?
- As nearly **97% of the global Buddhist population is based in Asia**, Buddhist diplomacy has the potential to promote regional cohesion.
  - For instance, during the Cold War, China effectively used Buddhist diplomacy to engage with its neighboring countries, and it continues to employ this approach to gain legitimacy for its Belt and Road Initiative.
- As India and China compete to dominate the Buddhist heritage as a tool for soft power, **India holds**

an advantage due to the faith's origins in the country.

Challenges before India

- Despite being home to a number of key Buddhist sites, such as Bodhgaya, Sarnath, and Kushinagar, India has **struggled to attract Buddhist tourists**, who tend to favor sites in Thailand and Cambodia.
- China is actively seeking to **exert control over the appointment of the next Dalai Lama**, which would be a blow to India's efforts to project its soft power through Buddhism.
- China, with its influence over Hollywood, has completely dominated the narrative around Buddhism through cinema, while in India there have not been any efforts made through cinema.

Way Forward

- India must act to ensure that it remains a **key player in the global Buddhist community.**
- To further strengthen its Buddhist diplomacy, India should continue promoting Buddhism at the highest levels of government, while also **organizing cultural events** to showcase the country's rich Buddhist history.
  - The **Indian Council for Cultural Relations (ICCR)** could play a significant role in promoting such events within and outside India.
- India should work to strengthen its ties with key Buddhist institutions and leaders around the world.
- India also needs to utilize the **reach of Bollywood in promoting its Buddhist heritage**.
- India's **G-20 presidency** this year could be used to promote Buddhist diplomacy on a bigger

scale through various cultural meetings, especially as Buddhist teachings align with the motto of India's G-20 presidency, **'One Earth, One Family, One Future'.**

Conclusion

- As Buddha was the first diplomat of peace, his teachings of peace and cooperation in these tough times can become the guiding light of Indian diplomacy on the world stage.

7) Blueprint for a blue economy
(GS3:   Conservation,   Environmental Pollution   and   Degradation, Environmental Impact Assessment)

Context

- The Comptroller & Auditor General of India (CAG) will chair SAI20, the Engagement Group for Supreme Audit Institutions (SAIs) of G20 countries in Goa in June. Two priority areas have been selected for SAI20 deliberations — **blue economy and responsible Artificial Intelligence.**

What is the Blue Economy?

- According to the World Bank, the blue economy is the "**sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of the ocean ecosystem."**

Significance of Blue Economy

- Blue or ocean economy's **global annual value** is an estimated **$2.5 trillion.**
- About **90 per cent of global trade** is carried out through sea routes.
- The blue economy encompasses an array of coastal activities, including fishing and tourism.

Challenges in Blue Economy

- In the context of India, studies indicate that **hazards of cyclones**

and **sea-level rise** are likely to be higher in the coastal regions.
- According to a study, GIS maps from the European Space Agency indicate that **15 percent of India's coastal areas have witnessed changes** between 1992 and 2018 due to agriculture, depleting forest cover and urbanization.
- The **population** living along the country's coastal areas is expected to rise from 64 million in 2000 to **216 million by 2060.**
- The measurement of the blue economy is challenging due to **conflicting definitions** and issues related to classifying different sectors and sub-sectors.

Initiatives to Boost Blue Economy
Sustainable Blue Economy Finance Principles
- In 2018, the **United Nations Environment Programme (UNEP)** had for the first time laid out the **Sustainable Blue Economy Finance Principles.**
- It is a framework investors can use to fund ocean-based industries.
- Financiers can use it as a reference point to see how marine investment can impact livelihood and poverty eradication.

National Blue Economy Policy
- India has marked the blue economy as **one of the 10 core sectors for national growth.**
- A National Blue Economy Policy that aims to **harness maritime resources** while preserving the country's rich marine biodiversity has been prepared by the **Ministry of Earth Sciences.**

Contribution of CAG to Blue Economy
- India's CAG aims to help **create a framework for G20 nations** to ensure inter-generational equity

and mitigate climate change while developing ocean resources.
- The CAG will prepare **technology-driven tools to assess authorized development in coastal stretches** and track marine water quality as a chair of SAI20.
- **Setting compliance standards and a national accounting framework** for the blue economy is a long-term priority for the CAG.

Way Forward
- A **new accounting framework** is needed that can objectively identify production, trade, and services related to the various segments of the blue economy.
- The executives should be adequately **equipped with infrastructure**, especially ICT hubs in place for early warning systems.
- The development of **disaster-resilient infrastructure** is need of the hour as the coastal ecosystems are vulnerable to various disasters like typhoon, hurricane etc.,

8) Maharashtra's urban governance model
(GS2: Important Aspects of Governance, Transparency and Accountability)
Context
- The government of Maharashtra recently launched an initiative targeting urban governance reforms - **Aspirational Cities Programme.**

State of urbanization in Maharashtra
- Maharashtra reported the **largest share of the urban population** of India (13.5 per cent) as per Census 2011.
- The share of the urban population in Maharashtra was **45.2 per**

cent, much higher than the national figure of 31.1 per cent.

- Maharashtra also reported the **largest number of slums** that are home to more than 11.8 million people living in these informal settlements comprising 34 per cent of the urban population.

Challenges of rapid urbanisation

- Cities in Maharashtra and other states continue to grapple with challenges and pressures relating to
  - **Basic infrastructure,**
  - **Air pollution,**
  - **Deficient infrastructure,**
  - **Social inequities,**
  - **Large informal sector (involving women and children),**
  - **Frequent mobility and migration,**
  - **With increased vulnerabilities to disasters and climate change.**

Need for effective urban governance

- Most of the challenges related to urbanisation **emanate from poor urban planning.**
- While cities constitute about 3 percent of the land in the country, they generate **70 per cent of the Gross Domestic Product (GDP).**
- Cities contribute substantially to economic growth and opportunities as urban India is undergoing a major transformation with an inward net movement of people for better livelihood opportunities.
- There is a robust **relationship between the index of cities' liveability and the country's GDP per capita** suggesting that long-term growth is only feasible if the city attributes in terms of providing equitable access to basic services, residences, and

improved economic management are provided seamlessly through digital service delivery platforms.

- Cities require a **holistic solution to problems** instead of a piecemeal approach by individual departments.

Maharashtra's urban governance model

- Maharashtra has conceptualised and initiated the **Aspirational Cities Programme (ACP)** modeled on the lines of the **Aspirational Districts Programme (ADP) of Niti Aayog.**
  - *The ADP is NITI Aayog's flagship initiative to uplift those backward 112 districts that are lagging behind in specific development parameters of health and nutrition, education, agriculture and water resources, financial inclusion, skill development, and basic infrastructure.*
- The ACP is based on **three priority areas** that will define the city's growth paradigm:
  - Integration of **inclusive urban development** that involves all development sectors thus bringing an integrated approach to urban programming;
  - **Adoption of scientific data methods** for assessing and monitoring outcomes of both state and central schemes;
  - Enhancing the voice and **participation of citizens in civic affairs** through physical and digital means.
- The ACP is set to focus on
  - **Improved governance**
  - **Address persistent civic issues**

- Provisioning adequate potable tap water to all households by taking advantage of the ambitious Jal Jeevan Mission.
  - **Increase funding avenues for the urban local bodies**
    - Reforms in property assessment by delinking it from the reasonable rental value method and adopting the market value of the property as a base for assessment would increase property tax, which is the main tax revenue of urban bodies.

Significance of the initiative

- This effort by the Government of Maharashtra is strategically contextualised with the "Viksit Bharat" (Advanced India) vision for India in 2047.
- **Putting people first** as part of urban development is a step in the right direction.
- **Bringing a sense of competition** amongst the cities for urban governance will turn the state into a trillion-dollar economy as well as ensure ease of living.

Conclusion

- As New India is **moving from its villages to the cities**, there is the need for renewed thinking and policies that are **citizen-centric** for which Maharashtra's urban governance initiative serves as a model.

9) G20 health agenda

(GS2: Bilateral, Regional and Global Groupings and Agreements involving India and/or affecting India's interests)

Context

- **India's** assumption of the **presidency of the G20 in 2023** forming the **G20 troika with Indonesia and Brazil,** marks the first time that the troika has been constituted solely by members from **Low and Middle-Income Countries (LMICs).**
- It is an opportunity to shape action, particularly in health care, toward their needs.

About G20 and its significance

- Founded in 1999, the Group of Twenty (G20) is the premier forum for its members' international economic cooperation and decision-making.
- It is an **international forum**, made up of **19 countries and the European Union,** representing the **world's major developed and emerging economies.**
- The G20 comprises Argentina, Australia, Brazil, Canada, China, European Union, France, Germany, **India**, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, UK and USA.
- It works to address major issues related to the global economy, such as international **financial stability, climate change mitigation, and sustainable development**
- The **G20 Summit is held annually**, under the leadership of a **rotating Presidency.**
- **Troika** refers to the top grouping within the G20 that consists of the **current, previous and the upcoming presidencies.**
- Together, the G20 members represent **85% of global GDP,**

75% of international trade and two-thirds of the world's population.

G20 members

Note: The European Union is also a member

India's priorities

- In health, India has identified the following priorities:
  - **Health emergency prevention, preparedness, and response**, with a special focus on **One Health and antimicrobial resistance**;
  - The strengthening of cooperation in the pharmaceutical sector with a focus on **access to safe, effective, and affordable medical countermeasures.**
  - **Digital health innovations and solutions** to aid universal health coverage and the improvement of healthcare service delivery.

Why should health be a priority?

- **Lessons from COVID-19**
  - The Covid-19 pandemic exposed deep vulnerabilities in the capacity of countries to deliver health services in a pandemic situation.
  - Covid-19 has illustrated how gaps in vaccine distribution, exacerbated by hoarding, place an

undue burden on poorer countries.

- **Impacts of future climate change**
  - Risk of spread of infectious diseases is very high, given the consequences of climate change. (**climate refugees** migrating to overpopulation area)
  - Predicted increase in frequencies of extreme events, with droughts, wildfires, and storms may result in adverse consequences for mental and physical health.
- **Need for One-Health perspective**
  - As most of the emerging infectious diseases are 'zoonotic', the health of entire ecosystems is to be given importance.
- **Increasing Antimicrobial resistance**
  - Increasing ability of the bacteria that cause disease to evade antibiotics is a cause of concern.

Recommendations

- Dealing with anti-microbial resistance requires a **better understanding of those social determinants** of disease that contribute to antibiotic misuse.
- Developing nudges that encourage more **rational use of antibiotics** at the individual level, as well as shifts in **government policy to penalize indiscriminate antibiotic use**, is an area where G20 countries could share lessons.
- Multilateral initiatives that address the interests of LMICs in accessing health care services would contribute to greater equity. This may include

- Diversifying locations where vaccines and drugs are made
- Enabling the transfer of the appropriate technology.
- The ability to maintain a long-term, accessible record of the trajectory, medical reports, and treatment regimes of individual patients in **digital format** which is transferable across states and possibly across countries, will be an increasingly important dimension of health in the future.
  - India's **Ayushman Bharat Digital Mission**, launched in 2020 in digitizing the health ecosystem could serve as a model to other LMICs.
- Ensuring privacy and security of health data, the elimination of the digital divide, as well as the requirement of balancing public good with privacy should form part of the G20 deliberations.

Conclusion
- India should reminisce the quote said by **Mahatma Gandhi,** "Recall the face of the poorest and weakest man you have seen, and ask yourself if this step you contemplate is going to be of any use to him" and make use of the opportunity to table effective policy decisions regarding health in its G20 deliberations.

10) Maoism: a social and economic problem
(GS3: Role of External State and Non-state Actors in creating challenges to Internal Security)
Context
- A recent attack in Chhattisgarh's Dantewada district that led to the death of 10 personnel of the District Reserve Guards (DRG) and their civilian driver shows

that the **Maoists retain the capacity to launch lethal attacks on security forces.**

Evolution of Maoists/Naxals
- The term 'Naxal' is derived from a village called **Naxalbari** in Darjeeling district of West Bengal where the movement originally emerged in 1967 as a small peasant rebellion by members of the Santhal tribe against the exploitation and oppression by local landlords.
- This movement which started as a local incident soon developed into a series of events.
- The Naxalite movement was led by **Communist Party of India (Marxist-Leninist)** founded in 1969 headed by Charu Majumdar.
- Within a few years of its beginning, the 'Naxal' movement spread to other states such as **Andhra Pradesh, Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, and Orissa.**
- However, Charu Majumdar was arrested in 1972 and jailed like several other Naxalite leaders.
- Following the release of several Naxal leaders in 1977, the Naxal movement was **fragmented into four major groups on ideological ground**: Maoist Communist Center (MCC), People's War Group (PWG), the Party Unity (PU), and CPI-ML (Liberation).
- It again disintegrated in the mid-nineties when Kondapalli Seetharamaiah was arrested and operations by the police and central paramilitary led to the arrests and surrender of almost 10,000 party activists.
- The movement had a resurrection in 2001 when the Naxals formed the People's Liberation Guerrilla Army (PLGA). (PLGA is an armed wing of CPI (Maoist))

- The MCC, PWG and the PU rejected the idea of parliamentary democracy and merged to form the unified CPI-Maoist in 2004.
- **The CPI (Maoist) and all its front organization formations have been included in the list of banned terrorist organizations under the Unlawful Activities (Prevention) Act, 1967.**

Naxalism - a multidimensional issue

- The fatalities inflicted on civilians and security forces by left-wing extremists fell below 100 in 2022 which is the lowest in four decades.
- However the Maoist problem being **multi-dimensional including social and economic aspects**, the problem has to be tackled in its entirety for its likely disappearance.

Fundamental flaws in anti-naxal strategy

Outsourcing operations to CAPF:

- In most states, there is a tendency to outsource the operations against Naxals to the central armed police forces.
- The states must realize that unless the local police, who know the language and terrain, take the lead in anti-Naxal operations, the problem would continue to exist.
    - For instance, In Punjab, the battle against terrorism could be won because, apart from other factors, the Punjab Police was always at the forefront of operations.

Capital intensive development plans targeting tribals:

- The **development paradigm** pursued since independence has always been **'imposed'** on the tribal communities and has been **insensitive to their needs and concerns.**

- As a result, government plans have ended up in destroying their social organisation, cultural identity, and resource base and generated multiple conflicts.
- The tribals want schools and hospitals, but they neither need nor want capital-intensive plants or factories, which are inevitably accompanied by deforestation and displacement.

No strategic anti naxal plan

- States have been carrying out anti-Naxal drives according to their individual understanding and there is **no overall strategic plan against the Naxals.**

Way Forward

- **Territorial domination followed by the administrative apparatus establishing its network** in the affected areas is essential.
- A conscious attempt should be made to **win the hearts and minds of the tribal people** who are usually the support base of the Maoists.
- If the government can have peace talks with the Nagas and several other insurgent outfits in the Northeast, then it can also take the initiative to have a dialogue with the Maoist leadership.

11) Muslims in higher education: A sobering tale

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

Context

- The recently released **All India Survey on Higher Education 2020–21** shows several contrasting trends.

Findings of the survey

- **Enrollment of Dalits, Adivasis and OBCs** in higher education has

increased by 4.2 per cent, 11.9 percent and 4 percent respectively compared to 2019-20.

- The upper castes, whose share in enrollment had been declining since the late 2000s witnessed the highest growth rate of 13.6 per cent.
- The **enrollment of Muslim students dropped by 8 per cent** from 2019-20 – that is, by 1,79,147 students. This level of absolute decline has never happened in the recent past for any group.

Decline in muslim students enrollment

- **UP** accounts for 36 per cent of that total decline followed by **Jammu and Kashmir,** which accounts for 26 per cent followed by Maharashtra, Tamil Nadu, Gujarat, Bihar and Karnataka.
- While the states that have a larger share of the Muslim population account for the higher share of decline, small states too show similar trends.
- Muslims, who account for about 20 percent of UP's population, have just 4.5 per cent of total enrollment. **UP alone witnessed the huge dropout** that corresponds to a decline of 16 per cent.

Various other findings related to muslims

- The **Sachar Committee Report (SCR)** submitted in 2006 showed that the **condition of Muslims in education was comparable to, or even worse than, the country's most backward communities.**
- According to the **Periodic Labour Force Survey (PLFS) data**, only about 19 per cent are currently attending higher education institutions, as against 21 per cent

among Adivasis, 26 per cent among Dalits, 34 per cent Hindu OBCs and 45 percent Hindu upper castes.

Reasons for decline in muslim students enrollment

- Muslims face the **highest unemployment rate** among socio-religious groups and even if employed they don't turn up for work which can be partly attributed to some sort of discrimination in the job market.
- The high dropout rate among Muslim youth is due to **lack of adequate money to continue studying** which pushes them to indulge in manual work and low-paying self-employment such as weaving and car repair.
- **Increased violence** against Muslims has restricted their spatial mobility.
- The **state support for Muslims has come down.**
    - o Karnataka which had been providing Muslims a sub-quota of 4 per cent within the OBC quota was scrapped recently.
    - o The Ministry of Minority Affairs has stopped the **Maulana Azad Fellowship** dedicated to pursuing higher education for minority students from 2022-23.

Way Forward

- The only reasonable policy for the government would be to **initiate positive discrimination in favor of Muslims** as per the recommendations of **Sachar Committee Report** and the **Mishra Report**.
- For instance,
    - o Kerala has not only seen positive growth in enrolment, it also tops in

the percentage of Muslim youth (43 per cent) who are currently attending higher education.

- o **How did Kerala progress?**
    - ▪ The century-old positive discrimination in favor of Muslims has helped the community to build educational capital in Kerala.
    - ▪ Muslims in Kerala enjoy 10 per cent reservation in government jobs and 12 per cent in educational institutions.
    - ▪ After Ezhavas (14 per cent), Muslims form the largest population who also claim a large share of quota in the state's OBC list.

12) G20's disaster management initiatives
(GS2: Bilateral, Regional and Global Groupings and Agreements involving India and/or affecting India's interests)
Context
- The G20 under India's Presidency has endorsed a **new working group on disaster risk reduction.** This makes it well-positioned to **prioritize disaster risk financing** to achieve the targets set by Sendai framework for 2030.

Impact of disasters
- Recent years have seen an increase in both natural and human-made catastrophes across the globe.

- The 2021-22 Human Development Report disasters not only **exacerbates poverty and thwarts development**, disasters also generate **social polarization** across nations and communities.
- Annual **disaster losses** account for a **significant share of GDP** in many low-income economies.

Challenges in disaster management
- There is **scarcity of investment** in a development-oriented approach.
- Significant **difficulty in collecting and analyzing data** on hazards and exposures.
- The necessity of strengthening **technical and institutional capacity** for risk assessment and modeling.
- The challenge of achieving **comprehensive coverage of disaster risks.**

Significance of G20 Disaster Risk Reduction Working Group
- The G20 has a crucial role to play in supporting countries to **strengthen their financial risk management capabilities.**
- By emphasizing the importance of disaster risk financing, the G20 can help governments worldwide to manage risk more effectively and ensure sustainable development.
- The **G20's new Disaster Risk Reduction Working Group (DRRWG)** will offer an extensive overview of disaster risk assessment and financing practices across a wide range of economies.
- It can also support the harmonization of definitions and methodologies for data collection and analysis to **improve access to international (re)insurance markets.**
- The DRRWG strives to address all the key components of a

comprehensive financial management strategy for disaster risks.

- These include encompassing disaster risk assessment and modeling, affordable and comprehensive insurance coverage of disaster risks, financial assistance and compensation for affected individuals and businesses, and risk transfer mechanisms, including catastrophe bonds and insurance, for management of fiscal risks.

- The consensus generated at the G20 DRRWG could play a significant role in directing **capital flow towards investments** that make societies and economies more **disaster resilient.**

- The working group will help issuers, investors, and other stakeholders to **identify and classify disaster-resilient investments, assets, and entities** in a more effective and evidence-based manner.

Recommendations

- States need to **enhance their capacity** to understand risks and **integrate them into government planning and budget processes.**

- The **insurance industry needs better regulation, legislation, and supervision.**

- **Financing** for response, recovery, and reconstruction needs to be improved.

- As disasters significantly impact the financial services industry and hinder progress towards the Sustainable Development Goals, the industry must incorporate material disaster risk into its **investment decisions.**

- There is a need to move beyond treating disasters as singular events and adopt a **multi-hazard approach,** considering various emergencies and risks in financial decision-making.

Conclusion

- Through the DRRWG's systematic and granular approach, the G20 will make a significant contribution to global efforts to manage disaster risks and build resilient economies and societies.

13) Significance of Andaman and Nicobar Command

(GS3: Security Challenges and their Management in Border Areas - Linkages of Organized Crime with Terrorism)

Context

- This article highlights the significance of Andaman and Nicobar Command (ANC) to counter China's increasing maritime presence in the Indian Ocean.

China in Indian Ocean

- Since 2013, China has engaged in an intense campaign of **building artificial islands** in the South China Sea.

- Using a huge fleet of dredgers, it has created over 3,000-4,000 acres of new land atop reefs and rocks.

- Three such **maritime outposts** — **Fiery Cross, Mischief and Subi Reefs** — have been provided with runways and harbors as well as guided-missile batteries.

- **Objectives of China's island strategy**
  - **Maritime domain awareness:** By developing capability to monitor all traffic that moves under or above the sea, a nation can extend its defensive

perimeter well beyond the homeland.

- o **Island posts:** By providing island outposts with surveillance facilities and fortifying them, a nation can project power over a huge oceanic expanse.

Significance of ANC for India

- The **Andaman and Nicobar (A&N) group of 572 islands**, closer to South East Asia than to peninsular India, forms a springboard from where India can project power, exert influence, or strike friendships in its eastern neighborhood.
- In 2001, India took a giant leap of faith by placing all Armed Forces located in the A&N Islands, including the Coast Guard, under the **unitary command of a newly created Commander-in-Chief, A&N (CINCAN).**
- ANC apart from ensuring defense of the territory, waters, airspace and the exclusive economic zone of the islands, the ANC was charged with **safeguarding the eastern approaches to the Indian Ocean** and establishing an **air defense identification zone (ADIZ)** over the islands.
- ANC became a **well-oiled, efficient and functional joint command**. For example, during the 2004 tsunami the ANC commanded by a dynamic Lieutenant General, rendered invaluable **humanitarian assistance and disaster relief** to the people of these islands.
- In its 22-year-long existence, the ANC has provided live proof that units of India's three armed forces can march, sail, fly and fight "jointly" and seamlessly, under a single commander.

- From a larger geostrategic perspective, the ANC can contribute to **Indo-Pacific security** given China's display of increasing belligerence in the Himalayas as well in the Pacific.

Issues surrounding ANC

- Despite frequent pleas by successive CINCANs, the tri-service force levels **remained small and inadequate for ocean surveillance** or establishment of an ADIZ.
- The services also, individually and collectively **failed to lend support** and reinforce the ANC.
- The ANC model and framework has **not been replicated anywhere else**.
- The **latest theater command model** under consideration **recommends the abolition of ANC** and its absorption by the Eastern Naval Command.

Way Forward

- The ANC needs to be suitably **fortified** and its force levels and firepower urgently augmented.
- The command must be **invested with capabilities** for:
  - (a) Maintaining comprehensive, three-dimensional maritime domain awareness
  - (b) defending the archipelago against military intrusions
  - (c) tracking and interdicting hostile ships/submarines and
  - (d) launching a rapid reaction force, when required, via airlift or sealift.
- India could play a key role in infusing dynamism into the Quad/Malabar construct by offering Port Blair in the Andamans as the location for a **shore-based secretariat** and "watering hole" for member navies.

14) Economic considerations and abusive relationships

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

Context

- This article highlights that economic abuse also forms a part of domestic violence, its causes, impacts and the way forward.

Economic abuse- a part of domestic violence

- Indian law recognises what is termed as **"economic abuse"** in the special legislation against domestic violence — the **Protection of Women from Domestic Violence Act, 2005 (PWDV Act).**
- However **violence or abuse in the economic context does not form part of the public consciousness** in the same manner as intimate partner violence of a sexual and physical nature does.

What is economic abuse?

- Under the **Protection of Women from Domestic Violence Act, 2005** (PWDV Act, **economic abuse** is defined as the **deprivation of all or any economic or financial resources** to which the aggrieved person is entitled under any law.
- The law recognises that prohibition or restriction to continued access to resources or facilities which the aggrieved woman is entitled to use is economic abuse as well.
- Any **alienation of assets** whether movable or immovable, valuables or other property in which the aggrieved woman has an interest is also included under the meaning of economic abuse.

- Economic abuse also brings up related issues such as **dowry and stridhan**, specific to the Indian context.

Why are women subjected to economic abuse?

- Women's access to **economic and financial resources** has been **limited** in Indian families, and often controlled by men.
- Certain actions performed by men that are indicators of economic abuse have a certain degree of **socio-cultural acceptance.**
- Some acts of economic abuse are unlikely to be immediately deemed as abusive acts in **patriarchal families** and structures. These include
  o Prohibiting women from working outside the home and accessing the job market, or
  o Insisting that women quit their jobs after getting married,
  o The husband or the father-in-law controls the salary earned by the wife or daughter-in-law respectively.
  o Complete decision-making power over the family's finances.
- All of this **diminishes the woman's control over her finances** and consequently her economic status.

Impact of economic abuse

- According to a recent survey, **59 percent of working women do not make their own financial decisions**, indicating the extent of **financial dependency** of Indian women.
- Economic violence holds back women from being truly independent and **obstructs their**

ability to make decisions regarding their lives.

- Apart from psychological, and emotional reasons and coercive control that perpetrators often exert, economic, financial and material barriers are **crucial considerations for survivors trying to leave abusive situations.**

Way Forward

- **Changing notions about masculine gender roles** alongside social attitudes with respect to men's control of the family's financial resources is critical to bring about change at a larger social level.
- **Supporting women's economic independence** through advocating for their right to work outside the home and make their own financial choices is needed.
- Apart from legal and policy interventions, **greater awareness and education** among women are key to combating economic abuse.
- **Promoting women's financial literacy** and addressing the social norms and systemic barriers which dictate women's relationship with work, money, and managing finances within the familial system in India are crucial to make headway in fighting against economic abuse.
- Appropriate training and support from the banking industry that helps banking professionals **recognise signs of financial abuse and assist victims** would go a long way in providing much-needed support to women looking to leave abusive situations.
- The tools and systems that support survivors apart from the law ought to be considered in India as well.

o For instance, the **UK's Financial Abuse Code, 2021** laid down principles designed to provide guidance on how to **support victim-survivors of financial and economic abuse.**

15) Women & climate change decision-making

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

Context

- The harshest consequences of climate change are felt by the most vulnerable. An intersectional lens that looks at the **barriers and challenges faced by vulnerable populations** is needed as we design adaptation and mitigation strategies to deal with the crisis.

Challenges faced by women- the most vulnerable

- In times of crisis, women are often left behind and face **increased health and safety risks due to inadequate infrastructure and the unequal burden of domestic care.**
- In low and middle income countries especially, women work harder to secure food, fodder, and water during extreme weather events, often leading to **girls dropping out of school** to support their mothers.
- If women in developing countries had the same access to resources as men, they could **increase agricultural yields**. However, due to **legal and cultural constraints,** less than 20 percent of landholders are women, with even fewer in North Africa and

West Asia, and Sub-Saharan Africa.

- Women are also less likely to survive during crises due to **long-standing inequalities** vis-a-vis **information-access and mobility** creating a vicious cycle of vulnerability to future disasters.
- Climate disasters worsen women's health by **limiting access to healthcare** and **increasing risks related to maternal and child health.**
- Emergent research reveals that women are more likely to experience **deaths from heat waves** in France, China, and India, and from **tropical cyclones** in Bangladesh and the Philippines.
- According to the UN, **60 percent of the world's hungry and malnourished are women.**
- Extreme heat increases the incidences of stillbirth, and the rampant spread of vector-borne diseases **worsens maternal and neonatal outcomes.**

Challenges ahead

- Women are not in decision making positions as they have **limited land owning rights and almost no financial resources.**
- One-fifth of major corporations have pledged to go net-zero by 2050 but **do not proactively include women at the board level.**

Need for involving women in climate change decision making

- To ensure **effective and equitable solutions to climate change**, it's essential to recognise the disproportionate impact on women and provide them with a seat at the decision-making table.
- Women have played a major role in the conservation of **agrobiodiversity**.

  o For instance, the **Equator initiative award** was won by **Komala Pujari in 2003, a tribal woman from Odisha,** for conserving local land races of paddy and getting farmers in Jeypore in Koraput district to shift to **natural farming methods.**
- Women farmers play an important role in the protection of environment and biodiversity as well as in taking care of the **health and nutrition needs** of their families.
- Indigenous communities have practical experience of living in harmony with nature.

Positives of involving women in decision making

- When women are involved in decision-making, it positively impacts the environment.
- Countries with higher female representation in parliament are more likely to **endorse international environmental agreements,** and have more **stringent climate policies.**
- Women's leadership in work places too has shown a positive correlation with **greater transparency regarding environmental footprints** and disclosure of emissions
- A gender-intentional response to the climate crisis will result in sustainable economic growth.

Conclusion

- Investment in infrastructure that is sensitive to gender concerns to cope with the climate crisis is the need of the hour.

16) Tribal health challenge

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

Context

- As India celebrates its achievements, it must also look towards the future and consider building an inclusive health care system that caters the needs of tribal communities.

India's achievements

- India emerged as the **world's fifth-largest economy** and a leader in the digital realm.
- India has demonstrated the ethos of **Vasudhaiva Kutumbakam** — One World, One Family. For example, India's contribution towards the global vaccination drive during the pandemic.
- Under the government's initiative, **"Vaccine Maitri",** India provided over 60 million vaccine doses to neighboring countries and other parts of the world.

Issues associated with tribal healthcare

- Tribal communities in India constitute 8.9 per cent of the population and remain the most **neglected and deprived group** when it comes to access to healthcare.
- As per a report by the Ministry of Tribal Affairs, the **mortality rate in tribal areas is 44 per cent higher than the national average**, and infant mortality is 63 percent higher.

Why tribal healthcare management is a challenge?

- The challenges the tribals face are **multifaceted** — lack of infrastructure, medical professionals, connectivity, affordability, equipment, insurance, funding, and much more.
- The health of communities is influenced by various factors which differ significantly for tribal communities, with a more communitarian social setup, an underdeveloped economy dependent on forest resources and **unique geographic conditions**, among others. As a result, their health outcomes **necessitate a unique approach.**

Solutions to tribal healthcare challenge

- There is an urgent need to **empower tribal communities** and ensure they receive equitable healthcare access.
  - o Empowering tribal communities must be done strategically, keeping in mind their traditions and other intangible heritage touchpoints.
- **Investing in medical colleges and training centers** across remote areas can equip local healthcare providers with necessary skills and knowledge.
  - o It has the potential to bridge the gap in healthcare infrastructure and provide employment opportunities for the local population.
- Capabilities of **public partnerships in redefining healthcare facilities** and accessibility should be utilized.
- With suitable investments, public policy and governance, healthcare can be made affordable and accessible to all.

Government schemes in this regard

Mera Baccha Abhiyan:

- It aims to **fight malnutrition through public participation** in Datia district, Madhya Pradesh.

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- As a result, the malnutrition rate in the district dropped by 17.5 per cent, making it lower than the state's average.
- Because of this, the district also witnessed a **rise in immunization, breastfeeding and a drop in diarrhea.**

Conclusion

- As India moves towards its centenary, the responsibility of providing healthcare, a fundamental human right, for all our fellow citizens, lies both with private and government institutions.
- Through inclusive leadership and investments in healthcare infrastructure in tribal areas, we can empower our tribal communities, achieve sustainable development, and fulfill the United Nations SDGs.

17) Better nutrition, fewer emissions

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

Context

- Climate change invariably affects everyone. However, having the **largest workforce (45.6 percent in 2021-22) engaged in agriculture** amongst G20 countries, the impact of climate change may be disproportionate for **India**.

Recent climate summit of G7

- At the **Hiroshima Summit 2023,** the G7 nations stressed that the peak for global GreenHouse Gas (GHG) emissions should be reached by 2025.
- They also committed to an **"Acceleration Agenda"** for G7 countries to reach net-zero emissions by around 2040 and urged emerging economies to do so by around 2050.
- **China has committed to net zero by 2060 and India by 2070.**

Adverse consequences of climate change

- The **World Meteorological Organisation (WMO)** has forecast that **global near-surface temperatures are likely to increase by 1.1°C to 1.8°C annually** from 2023 to 2027.
- It also anticipates that temperatures will exceed 1.5°C above pre-industrial levels for at least one year within this period.
- According to the Indian Meteorological Department (IMD), India experienced its **fifth hottest year** on record in **2022**.

Challenges in Indian agriculture sector

- Against the backdrop of worsening climate change Indian agriculture faces challenges.
- Feeding the largest population (1.42 billion in 2023 and likely to be 1.67 billion by 2050), while contending with the increasing vagaries of nature remains a challenge.
- While India's grain production gives some comfort, the **nutritional challenge remains.**

What can Indian policymakers do?

- Focusing on **agricultural research, development, education and extension (ARDE).**

Significance of ARDE

Gives greater returns:

- A recent research indicates that **investing in agri-R&D yields much greater returns** (11.2) compared to every rupee spent on say the fertilizer subsidy (0.88), power subsidy (0.79), education (0.97), or roads (1.10).

Increases production:

- Increased emphasis on ARDE can help achieve **higher agricultural production** even in the face of climate change.

Improves resource use efficiency:

- ARDE is critical for **improving resource use efficiency,** especially for natural resources such as soil, water, and air.
- **Precision agriculture,** such as drip irrigation, can result in large water savings.
- Implementing **sensor-based irrigation systems** for example, enables automated control, improving resource use efficiency.

Reduces carbon emissions

- **Fertigation and development of nano-fertilizers** can not only save on the fertilizer subsidy but also reduce its carbon footprint.
- Implementing such **innovative farming practices and/or products** will help more **efficient use of water and other natural resources**, resulting in higher output with fewer inputs, while lowering GHG emissions.

ARDE allocations

- The **total ARDE expenditure has increased** from Rs 39.6 billion in 2005-2006 to Rs 163 billion ($2.2 billion) in 2020.
- The **research intensity (RI)** (ARDE as a percentage of agri-GDP) has experienced an **upswing** from 0.55 per cent in 2005-06 to its peak of 0.70 per cent in 2010-11 and then **declined** to 0.48 per cent in 2019-20.
- The allocation of ARDE is a **skewed distribution towards the crop husbandry sector.** In contrast, the shares for soil, water conservation, and forestry have declined.

- The shares for animal husbandry, dairy development, and fisheries sectors have decreased despite the value of livestock having substantially increased in the overall value of agri-produce.

Way Forward

- India needs to almost **double its budgetary allocations for ARDE.**
- If the Union government can reduce its fertilizer subsidy, and state governments their power subsidy, and **redirect those savings to agri-R&D, ensuring research intensity to be at least 1 per cent**, the results would be much better in terms of food and nutritional security in the face of climate change.
- With the substantial increase in the budgets for ARDE, policies (such as fertilizer subsidy, power subsidy, etc) should also be aligned towards meeting the climate change challenge.

18) Economics of biofuel
(GS3: Conservation, Environmental Pollution and Degradation, Environmental Impact Assessment)
Context

- The government's bid to raise the level of **ethanol blending in petrol to 20 per cent (E20) by 2025**, instead of 2030, needs a serious rethink.

Why does E20 by 2025 need a revisit?

- A recent report released by a private policy analyst **rules out the availability of enough raw material** to produce the required 13.5 billion liters of ethanol.
- The **2018 National Policy on Biofuels** envisages using agricultural produce, such as sugarcane, rice, and maize, to make alcohol. However,

- These crops already have **committed demand for food, feed, and other purposes.**
- The scope of expanding the areas under them is limited because of **scarcity of both land and water.**
- While sugarcane and rice are water guzzlers, the output of maize is already insufficient to meet the demands of the poultry and starch sectors.
- **India does not hold much land** to grow crops exclusively for biofuel production like other countries like **Brazil**, the world's leading sugar and ethanol producer have.
- The **productivity** of these crops in India is **lower** than the global averages and their **use for food and feed has to be given priority.**
- For a country like India, where **malnutrition is rampant**, and its ranking on the global hunger index is low, diverting food grains like rice and corn for ethanol production seems inappropriate.
- Most of the **existing vehicles** are, typically, not made to run on high ethanol-doped fuels because they would **require modifications** for this purpose.
- Besides, the **level of emission reduction** achieved by replacing a small part of petrol with ethanol is found to be too **meager** and it requires a high cost to be invested.

Way Forward

- To augment the supply of ethanol for mixing with petrol, **producing it by deploying second-generation (2G) technology** would be a step in the right direction.
  - 2G technology enables **converting farm wastes, including crop residues** like stubbles, straws, and stalks, into alcohol.
- Along with already coming up **2G ethanol plants** are in Panipat (Haryana), Bathinda (Punjab), Baragarh (Odisha), and Numaligarh (Assam), setting up more such plants would provide ethanol for petrol-doping and also **mitigates the menace of crop residue burning**, which adds to air pollution.

19) Myths of rising population

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

Context

- According to the **State of World Population 2023 Report**, published by the **United Nations Population Fund**, **India will surpass China to become the most populated country** in the world by July this year.

Population Estimation

- India's population is pegged to reach **142.86 crore** against China's 142.57 crore by July 2023.
- **25% of India's population is in the age group of 0-14 years, 18% in the 10-19 age group, 26% in the age bracket of 10-24 years, 68% in the 15-64 years age group, and 7% above 65 years.**
- India has also the **highest working-age population of 1.1 billion** which is 75 per cent of the total population.

Busting the myth of population rise threat

- The population rise threat is **more of a myth** now. Global population growth has been less than 1 per cent since 2020.
- **Two-thirds of the world population live in countries that**

have a **below total fertility rate (TFR) of 2.1,** or the **zero-growth fertility rate.**

- o *The total fertility rate is defined as the average number of children that would be born to a woman by the time she ends childbearing.*
- The report reveals that over the next few decades, **migration will be the sole driver** of population growth in high-income countries, as the number of deaths will progressively exceed the number of births.

Indian Scenario on Depopulation

- By current United Nations estimates, **India's population will begin to decline only in 2063.**
- **Fertility in India is falling along expected lines** as a direct result of **rising incomes and greater female access to health and education.**
- Government data reveals that **23 states and Union territories had a total fertility rate below replacement level** (TFR of 2.1).
- The **Economic Survey 2018-19** said that **India's population growth rate will decline faster than assumed.**

Way Forward

- There should be **emphasis on harnessing the potential of demographic dividend.**
- There is a need for **much focus on betterment of living standard of living by providing skills to the youth.**

20) A silent crisis

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

Context

- There has been an increase in the incidence of diabetes amongst the tribal population in India.

Tribal communities

- **Tribal communities** in India constitute approximately **8.9% of the country's population.**
- According to a study by the Ministry of Tribal Affairs, **newborn mortality in tribal communities is 63 % higher than the national average.**
- **Tribal people are at higher risk of getting chronic diseases** such as diabetes, hypertension, cardiovascular diseases, cancer, and mental disorders.

Diabetes

- Diabetes is a **metabolic disorder in which the body has high sugar levels for prolonged periods of time.**
- The **lack of insulin** causes a form of diabetes.
- **Type I Diabetes** is a medical condition that is caused due to insufficient production and secretion of insulin from the pancreas.
- **Type II Diabetes** occurs when the body is unable to use insulin effectively and can't keep blood sugar at normal levels.

Diabetes in Tribal population

- According to a study, **about 13% of tribal adults have diabetes and 25% have high blood pressure.**
- A study revealed that the **mean age for the onset of diabetes was slightly earlier for tribal population** as compared to non-tribals.
- Some tribal population suffer from **fibrocalculous pancreatic diabetes**, an uncommon but severe form of diabetes.
  - o *Fibrocalculous pancreatic diabetes (FCPD) is an uncommon form of diabetes*

that occurs as a result of chronic calcific pancreatitis.

o *The disease is restricted to **tropical regions** of the world, and **southern India has the highest known prevalence** of FCPD.*

o *The typical patient with FCPD is a lean adolescent or young adult of either sex, presenting with history of recurrent bouts of abdominal pain and steatorrhea.*

o ***Chronic pancreatitis** is an inflammation of your pancreas that impairs your body's ability to digest food and regulate blood sugar.*

Lean diabetes

- Most tribals also suffer from lean diabetes **(patients with low-normal body mass index).**
- It is a medical condition that involves **dual stress of intermittent starvation and overload of carbohydrate metabolism.**
- A study revealed that **lean diabetes in India is as high as 23 percent.** Cases of lean diabetes are seen spreading among tribals in Chhattisgarh.

Reasons for Diabetes amongst tribal population

- **Poor socio-economic status, history of childhood malnutrition and rural origin** are important factors for a rise in diabetes in tribal population.
- **Over reliance on rice** distributed through Targeted Public Distribution System (TPDS) is attributed to the sudden rise of diabetes in the tribal population.
- Traditionally, the tribal population would cultivate **millets, grow vegetables and fruits.** This practice has vanished over the years.

- There has been a **shift in food consumption in tribal population.** The traditional platter consisting of millets like jowar, bajra, meat, green leafy vegetables and seasonal fruits has been replaced with higher consumption of white rice, rotis, dal, etc.

Report by Expert Committee on Tribal Health

- In 2018, an expert committee, constituted jointly by the Ministry of Health and Family Welfare and Ministry of Tribal Affairs released the **first comprehensive report on Tribal Health in India.**
- Recommendations of the Report:
  o Introduce **ST Health Cards for tribal people** living outside scheduled areas to facilitate access to benefits at any healthcare institution.
  o **Enhance food security and strengthen Integrated Child Development Services (ICDS)** to address malnutrition.
  o Publish a **State of tribal health report** every three years.
  o Establish a **Tribal Health Index (THI)** to monitor tribal health.

Way Forward

- Government must invest in **proper data management systems for disease control, training of ASHA and healthcare workers, hospitals infrastructure etc.**
- **Decentralised care** and establishment of other **non-medical approaches** like peer support groups etc to create awareness and inclusivity.
- The situation can be improved by **nutritional rehabilitation of mixed food types**, including egg, millets and nuts which can be distributed through TPDS.

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21) Rise in Fungal Infections

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

Context

- Due to climate change fungal infections are not just spreading at a faster rate but also new infections are emerging globally.
- Fungal diseases are a **public health threat** as they are often difficult to manage.

Fungi

- Fungi is a **heterotrophic, eukaryotic organism.**
- Most fungi are **multicellular**, although some, such as yeasts, are **unicellular.**
- **Both sexual and asexual modes of reproduction** can take place in fungi.
- Examples of diseases caused by fungi are **ringworm and histoplasmosis.**
- It is estimated that there could be 6 million species of fungi, of which scientists have so far identified only about 150,000 species.

Importance of fungi

- Fungi play an important role in the **process of decomposition** by converting organic matter into inorganic substances.
- Such nutrients are returned to the soil and are made available to plants for intake to aid growth.
- Fungi are also a part of the **human microbiome**. Also known as **commensals**, they live on human skin, in mucosal surfaces such as the oral cavity and vagina and in the gut, where they assist in digestion and train the immune system and its responses.
- Humans also use fungi for **production of bioactive chemical compounds** such as food (bread, cheese and wine), fuels (ethanol and biogas), pest control (herbicides, pesticides) and antibiotics (such as penicillin and cephalosporins).

Emerging Threats

- More than 300 million people are affected by **serious fungal infections**, with nearly two million deaths every year. This is **higher than the mortality caused by either tuberculosis (TB) or malaria.**
- **Medical interventions** that include immunosuppressants, persistent HIV infection and diabetes are **helping growth of harmful fungi.** Eg: The outbreak of **mucormycosis** (referred to as black fungus) in India, in 2021.
- Fungi in nature have begun **adapting to higher temperatures** and **non-disease causing fungi are turning into disease causing fungi.**
- There are only **four classes of antifungals** and fungus have started showing **resistance to some of them.**

Fungal Priority Pathogen List (FPPL)

- The **World Health Organisation** released the first ever FPPL which includes 19 fungi that can be a **threat to public health.**
- The major objective of the FPPL is to **further research and policy interventions** to strengthen the global response to fungal infections and antifungal resistance.
- The WHO FPPL list is divided into **three categories: critical, high and medium priority** based on the pathogen's public health impact as well as emerging antifungal resistance risk.

Critical group	High group	Medium group
Cryptococcus neoformans	Nakaseomyces glabrata (Candida glabrata)	Scedosporium spp.
Candida auris	Histoplasma spp.	Lomentospora prolificans
Aspergillus fumigatus	Eumycetoma causative agents	Coccidioides spp.
Candida albicans	Mucorales	Pichia kudriavzevii (Candida krusei)
	Fusarium spp.	Cryptococcus gattii
	Candida tropicalis	Talaromyces marneffei
	Candida parapsilosis	Pneumocystis jirovecii
		Paracoccidioides

Way Forward

- There is a need to improve **global coordination** in addressing fungal diseases, update infection, prevention and control measures and training public health professionals to appropriately treat fungal diseases.
- It is important to **strengthen laboratory capacity and surveillance of diseases.**
- It is essential to **promote sustainable investments** in research, development, and innovation to counter the risk of rising fungal infections.

Model Questions

1. Discuss the future potential of Quantum computing and suggest measures that India should take to join the race towards quantum supremacy.

2. Critically analyse the Digitization of healthcare sector in India.

3. LIGO-India will accelerate discovery and innovation in India and around the world. In this context, explain the significance of the LIGO-India project.

4. There is an urgent need for advancing health care services for drug users rather than criminalizing them. Discuss.

5. How different is Indian Space Policy 2023 from the previous efforts? Discuss.

6. Can Buddhism serve as a soft power tool in India? Substantiate your view point.

7. Along with discussing the significance and challenges associated with the blue economy, list out the steps taken by the government to promote the blue economy.

8. Maharashtra's urban governance initiative serves as a model to tackle the challenges of ever increasing urbanization in India. Discuss.

9. India can leverage the opportunity in G20 to shape its action in healthcare. Discuss.

10. Maoists still retain the capacity to launch lethal attacks on security forces. In this backdrop, discuss the flaws in anti naxal strategy and how can it be corrected?

11. Enumerate the reasons for the recent decline in enrollment of muslims in higher education with region specific statistics. Also explain how it can be increased.

12. Being the President, India can very well guide G20's disaster management initiatives. Comment.

13. Explain the significance of bolstering Andaman and Nicobar Command to combat China's increasing maritime presence in the Indian Ocean.

14. Define economic abuse. Why are women subjected to economic abuse? Suggest some measures that can help women come out of such abusive relationships.

15. Women are the worst affected at times of climate change crisis. In this backdrop, involving women in the climate change decision making table holds significance. Discuss.

16. What are the challenges in managing tribal healthcare and how can it be tackled?

17. Focusing on agricultural research, development, education and extension (ARDE) is significant in the backdrop of worsening climate change related challenges to the agriculture sector. Discuss.

18. Do you think that India can achieve the target of 20 percent blending of ethanol with petrol by 2025? Substantiate.

19. "There has been an increase in the incidence of diabetes amongst the tribal population in India". Discuss

20. "India is expected to surpass China to become the most populated country in the world by July this year." In reference to the given statement critically analyse the impact of Depopulation on the Indian Economy.

21. What are the causes for increasing anti-fungal resistance? How does an increase in fungal diseases pose a public health concern?