

# OFFICERS' Pulse

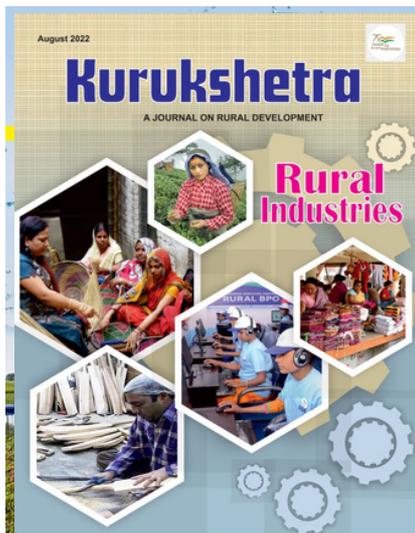
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- IN DEPTH



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## 1) Repercussions of global temperature rise for India

### Context

- From an early onset of heat waves across northern states to one of the worst floods in recent years in Assam and other northeastern states, India has experienced several record-breaking weather events so far this year.
- An assessment by the **Union Ministry of Earth Sciences** in 2020 states that since the middle of the twentieth century, **India has witnessed a rise in extreme temperature and rainfall events, droughts, and sea levels and an increase in the intensity of severe cyclones, alongside other changes in the monsoon system.**

### Grim Forecasts

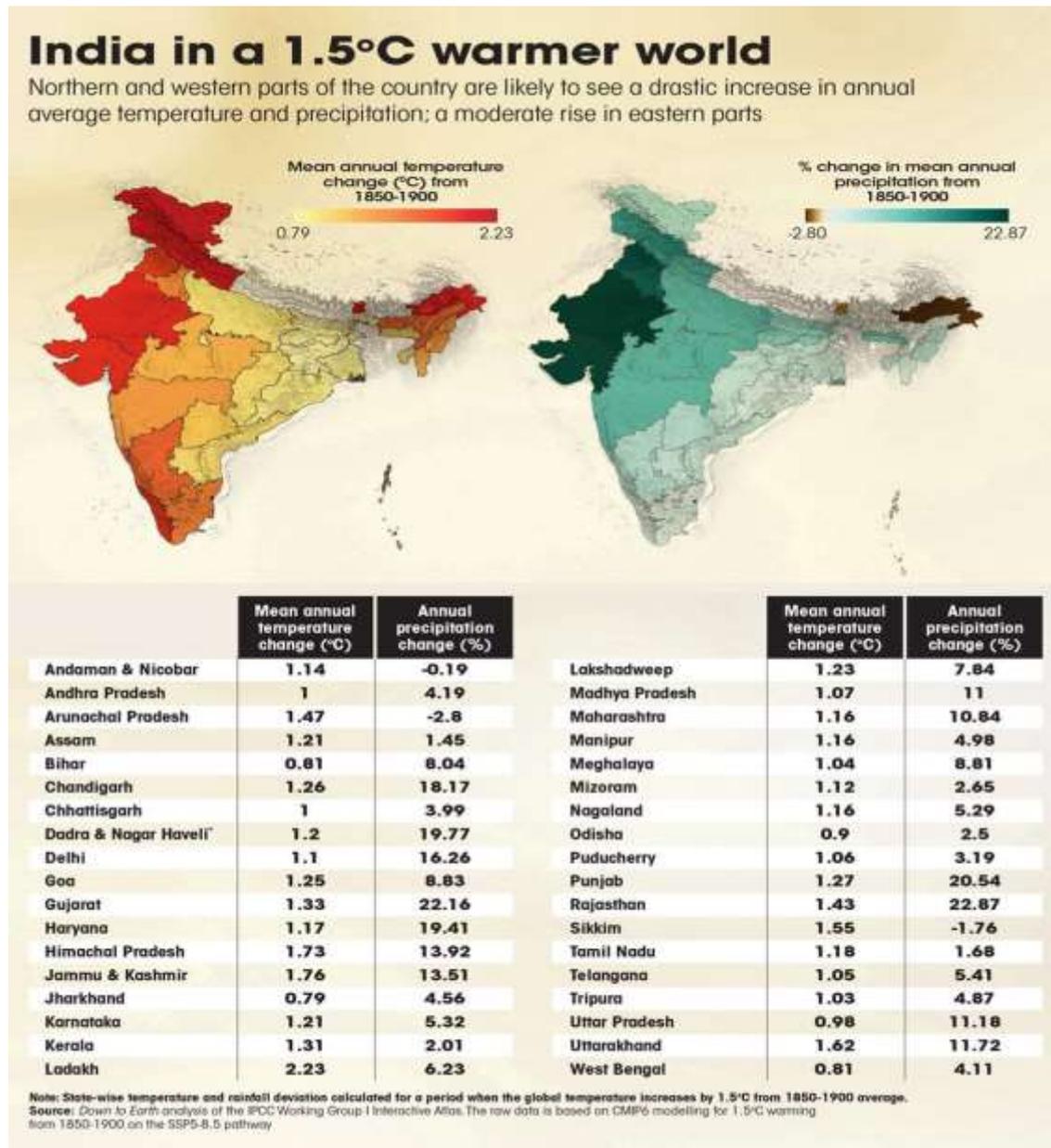
- According to the **UN Intergovernmental Panel on Climate Change's (IPCC) Assessment Report 6**, the world is on track to breach the **temperature guardrail of 1.5°C in the next 18 years.**
- As per analysis, **India could become 1.2°C warmer and receive almost 10% more rainfall every year** and **Ladakh** is likely to be the worst hit at 2.23°C warmer than pre-industrial levels.
- Annual mean temperatures may rise in five other Himalayan states which are Jammu and Kashmir (1.76°C), Himachal Pradesh (1.73°C), Uttarakhand (1.62°C), Sikkim (1.55°C) and Arunachal

Pradesh (1.47°C). The temperature rise is most likely to **trigger the rapid melting of glaciers and precipitation change.**

- The **northern and western parts of India will likely be more vulnerable** than the eastern part, in terms of temperature rise. The arid states of Rajasthan and Gujarat will likely see 1.43°C and 1.33°C increase in annual average temperatures.
- In contrast, Jharkhand, Bihar, West Bengal and Odisha could record less than 1°C increase in their annual average temperature, when the world crosses the 1.5°C threshold.

### Impacts

- The warmer temperatures may translate into an **increase in the number of days of heatwaves.**
- While most of India is expected to see an **increase in rainfall, the distribution of this increase is likely to be uneven.** The maximum increase in rainfall is expected in **northwestern India.** Eg: Rajasthan could receive up to 22.87% more rain than the 1850-1900 average, followed by Gujarat with 22.16% and Punjab with 20.54%.
- Arunachal Pradesh, Sikkim and Andaman and Nicobar are the only three states and UTs where rainfall levels are most likely to go down.
- The repercussions of a 1.5°C global temperature rise would be **catastrophic for India.**



### More than Weather

- As per analysis by IPCC, **Northwest India** shows both enhanced warming and a significant increase in rainfall. **Kerala, Tamil Nadu, and northeast India** show enhanced warming, but only a nominal increase in rainfall or even a decrease in rainfall. The **eastern states of Odisha, West Bengal, Jharkhand and Chhattisgarh** show nominal warming and a nominal increase in rainfall.
- The **low-level jet stream winds**, responsible for the monsoon rains, have been **moving northwards**

over the past three decades. This consistent movement has led to a **drying trend** in the southern part of the Western coast of India and a **wetter monsoon season** in the upper parts of the Western coast in the last three decades.

### Conclusion

- The recent findings underscores the need to get serious about the climate crisis and at the same time gives insights into what awaits each state or UT. This will help the governments in climate adaptability.

## 2) Empowering Women Leaders at Grassroot level

### Context

- In the 30th year of panchayati raj, India got its first woman president from the adivasi community. But the rise of Droupadi Murmu from the position of a nagar panchayat councilor in Odisha to the Rashtrapati Bhavan does not tell the real story of women's leadership in India's panchayati raj institutions (PRIs).

### Scenario in India

- The **process of decentralization has provided representation, but representation does not necessarily lead to participation.** It alone is not sufficient for women to exercise their roles.
- India has 1.45 million female elected representatives in PRIs, the highest in the world. However, in the current Parliament, the **Rajya Sabha has only 12.24% women representatives.** In the **Lok Sabha**, the representation is **nominally better at 14.44%.**
- Women make up an **even smaller proportion of state legislative assemblies**, accounting for an average of **only 8% of all elected members.**
- While Nagaland and Mizoram do not have a single female member in their legislative assemblies, another 15 states/UTs have less than 8% women representation.
- Given the situation, the women politicians demand reservations in Parliament and State assemblies. In May 2008, the Rajya Sabha introduced a Bill to **reserve 33 per cent of the seats** in Parliament and state assemblies for women. The Upper House passed the Bill in 2010 and transferred it to the Lok Sabha, where it eventually **lapsed**

in 2014 without a proper discussion.

### Challenges in Achieving Participation

- A 2008-09 study by **Participatory Research In Asia (PRIA)** revealed that the social milieu prevented women leaders from speaking in public.
- Eg: In Gujarat, tradition prevented women leaders from speaking in front of elders or men in general. In Haryana, women were unable to participate due to social taboos, overbearing male colleagues and hostile work environment.
- Women are facing **mobility constraints in terms of household chores, family interference, and economic dependency.**
- Political parties prefer to field male candidates for elections. The practice of **proxy candidates** exists across the country, though the degree differs from state to state.

### Kerala's Model

- **Kerala's Kudumbashree scheme** offers some insights into how to increase women's participation.
- Launched for **poverty alleviation** in 1998, the scheme consists of a **three-tier structure** with neighbourhood groups as primary level units, area development societies at the ward level, and community development societies at the local government level.
- Membership is open to all adult women, and limited to a single membership per household.
- The neighborhood groups, consisting of around 20 members, work on a range of issues such as health, nutrition, agriculture, besides carrying out income generation activities and seeking micro-credit.

- Most women elected to PRIs in Kerala have evolved from the Kudumbashree network.

### Way Forward

- India needs to reform panchayati raj institutions, reserve seats in Parliament and legislative assemblies to create more women leaders like the new President Droupadi Murmu as women's political participation is a fundamental prerequisite for gender equality and genuine democracy.

## 3) Changes in Nitrogen Cycle

### Nitrogen Fixation

- **Nitrogen** is all pervasive. It is more abundant in the air than oxygen and constitutes **78% of the atmosphere**.
- Nitrogen is also **vital to life** as it is essential for plant nutrition and thus, sustains all the other beings but **plants cannot use atmospheric nitrogen directly** the way they absorb carbon dioxide (CO<sub>2</sub>) for photosynthesis.
- For this, they depend on a **biogeochemical cycle** which, with the help of some bacteria or even lightning, combines the inert gas with other elements to form reactive compounds like ammonia and nitric oxide and fix them in the soil (the process known as "**nitrogen fixation**"). Studies have revealed that this cycle is getting disrupted.

### Problems with Nitrate Pollution

- The **levels of reactive nitrogen have increased tenfold** since the pre-industrial era due to **rampant use of synthetic nitrogen fertilizer and burning of fossil fuels**.
- This has caused **algal blooms**, created **dead zones** in oceans and **accelerated biological diversity**

**loss** in aquatic and terrestrial ecosystems.

- Nitrate is one of the most widespread **groundwater contaminants** across the world. Nitrates are associated with various **health impacts** including certain cancers like colorectal cancer, thyroid disease, and adverse birth outcomes like nervous system defects, very preterm birth and very low birth weight.

### Problems with Declining Nitrogen Availability

- Recent studies have revealed that just like too much nitrogen, declining availability of nitrogen is also a cause of worry.
- While forests with **high nitrogen availability** suffer from **less diversity** as they allow certain species to flourish at the cost of others, **low-nitrogen forests are more likely to have plants growing slowly with fewer leaves**.
- Scientists have found that **nitrogen availability is declining in many non-agricultural terrestrial ecosystems** that do not receive additional reactive nitrogen because of human activities.

### Causes

- **Atmospheric CO<sub>2</sub> concentration has increased by 50%** since the 1750s. This has **quickenened the rate of photosynthesis** in plants up to a saturation point, **leading to higher nitrogen demand by plants**. Rising temperatures are also known to **stretch the growing seasons**, adding to this demand.
- Recent studies warn that large parts of Australia, sub-Saharan Africa, parts of Asia and South America and vast swathes of boreal forest, that have remained free of additional reactive nitrogen, **could**

lose their natural deposits of nitrogen in a warming world.

### Conclusion

- Understanding the nitrogen cycle in its entirety is crucial as it is a **key component of amino acids** that form the building blocks of plant proteins and enzymes.
- Reduced levels of nitrogen in plants can have a worrying impact on the health of insects and grazing mammals that depend on leaves for protein.
- Herbivores may initially respond to the situation by increasing consumption, but it eventually affects their growth, survival, reproduction and population size.

## 4) Taking Ownership

### Context

- Villagers around Chhattisgarh's Udanti Sitanadi Tiger Reserve staged protests demanding Community forest resource rights (CFRR) under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.

### Spectrum of Rights under Forest Rights Act, 2006

- In 2006, the Parliament enacted **The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006** (referred to as the **Forest Rights Act or FRA**).
- The law vests a number of rights to Forest Dwelling Scheduled Tribes (FDSTs) and Other Traditional Forest Dwellers (OTFDs), including **individual and community rights over forestlands, and the rights to protect and manage community forest resources** within the traditional or customary boundaries of the villages.

- The **Ministry of Tribal affairs** is the nodal agency for FRA implementation in the country.
- FRA recognises **14 types of pre-existing rights of forest dwellers** on all categories of forestland including protected areas. The most significant rights are included in Section 3(1) of the Act which are as follows:
  - **Individual Rights:** Individual forest rights (IFRs) allow tribal people to secure individual tenures under FRA, which include the right to hold and live on the forestland under the individual or common occupation for habitation or for self-cultivation for livelihood by a member or members of a forest dwelling Scheduled Tribe or OTFD.
  - **Community Forest Rights:** Community forest rights (CFR) allows for the use of and access to forestland and resources. These comprise rights such as rights of ownership and access to collect, use and dispose of minor forest produce (non-timber forests products or NTFP), grazing and traditional seasonal resource access of nomadic or pastoralist communities; right of access to biodiversity and community right to intellectual property and traditional knowledge related to biodiversity and cultural diversity and any other traditional right.
  - **Community Forest Resource Rights:** Community forest resource rights (CFRR) are much broader in scope. They recognise not just forest communities' rights to access and use forest produce, but also

their **right to protect, regenerate, conserve or manage any community forest resource** which they have been traditionally protecting and conserving for sustainable use. Once CFRR is recognised for a community, the **ownership of the forest** passes into the hands of the **gram sabha** instead of the forest department and they are **free to form their own rules and regulations for management, use and conservation** by adopting their age-old traditional practices. Without its consent, the forest cannot be diverted for any use, including wildlife conservation.

#### Present Scenario

- Since 2012, there has been a significant rise in the number of forest communities and villages demanding CFRR. The number of state governments that have granted CFRR rights has also increased.
- As of March 2022, out of India's 28 states, nine have been granting CFRR while four states are processing applications.
- Since 2014 there has been stagnancy in individual claims, but the percentage of community forest rights has increased pan-India.
- In 2020, the Union Ministry of Tribal Affairs set up a committee headed by a former secretary to the Union government, N C Saxena, to recommend guidelines on the use of community forest resources.

#### Recommendations of N.C Saxena committee

- The committee puts the **gram sabha at the core of CFRR management, with the power to take all decisions.**

- It says the gram sabha should constitute the **Forest Rights Committee (FRC)** that will play a vital role in identifying community forest resources and hence the territorial jurisdiction of the gram sabha and its **decisions with regard to the identification of community forest resources shall be binding.**
- The recommendations added that while forest resources other than minor forest produce, like timber, will not fall under the territorial jurisdiction of the gram sabha they should be **managed by the forest department in consultation with the gram sabha.**

#### Conclusion

- An estimated 15% of global forests are managed as community resources by indigenous peoples and local communities. Globally, **deforestation is generally lower on indigenous territories where there is security of land tenure and continuity of traditional knowledge.**
- If control comes under forest communities, it will accelerate conservation and regeneration of forests. We should make efforts to move in this direction.

## 5) Livelihood Promotion under DAY-NRLM

#### Context

- Deendayal Antyodaya Yojana - National Rural Livelihood Mission (DAY-NRLM) is one of the **self-employment programmes** of the Government of India. It seeks to **organise about 10 crore households into Self Help Groups (SHGs) and link them to sustainable livelihood opportunities** by building their skills and making available

financial, technical, and marketing resources at a grassroots level.

- The Mission focuses on **four core areas** namely:
  - (i) social mobilisation and promotion of sustainable community institutions of the rural poor;
  - (ii) financial inclusion of the poor;
  - (iii) sustainable livelihoods; and
  - (iv) social inclusion, development, and convergence.
- NRLM has been implemented in a mission mode across the country from 2011, which was further restructured in 2013, and in 2015, it was renamed DAY-NRLM.

#### Main Features of the DAY-NRLM

- **Universal Social Mobilisation:** At least one-woman member from each poor rural household needs to be brought into the SHG network. Poor households would be identified through a participatory process and approved by the Panchayati Raj Institutions.
- **Implementation by the Poor:** The poor are the cornerstone of the entire strategy of overcoming poverty with their participation in different activities.
- **Convergence of NRLM with Various Programmes and Panchayats:** Through convergence, synergies among different programmes of the ministries and the institutions of the poor are established for optimising the efforts.
- **Promotion of SHG Federations:** DAY-NRLM as a strategy of its institutional development, deepening governance, achieving transparent financial management, and maintaining accountability

envisaged in forming federations at village level known as **Village Organisation (VO)**, cluster of villages level federation known as **Cluster Federation (CF)** and blocks level federation known as **Block Federation (BOs)**.

#### Main Components and Sub-Schemes of DAY-NRLM

- **Institution Building and Capacity Building:** Under the Mission, capacity building training institutions are created to enable the poor to overcome poverty through access to financial, technical, and marketing resources. These institutions are provided multiple funds such as **Revolving Fund** (Rs. 10,000 to Rs. 15,000), **Community Investment Fund (CIF)**, etc. to strengthen their financial base and help them enhance their existing funds.
- **Financial Inclusion:** For Financial inclusion, **each SHG is to be linked to banks** to access all financial services from them including loans. Financial services are also provided in remote areas with the help of a woman belonging to an SHG acting as **Banking Correspondent Sakhi** with the assistance of banks and Common Service Centres.
- **Interest Subvention:** SHG members are eligible for receiving interest subvention equal to the difference between the borrowing rate of interest and 7 percent.

#### Sub-schemes

- **Mahila Kisan Sashaktikaran Pariyojana (MKSP):** It was launched with the objective to **empower women in agriculture** by making systematic investments to enhance their participation and productivity in agriculture based livelihoods and building the capacity around sustainable harvesting and post-harvesting

techniques for non-timber forest products (NTFPs).

- **Start-up Village Entrepreneurship Programme (SVEP):** SVEP supports entrepreneurs to **set up small businesses in rural areas**. It is for promoting knowledge about business feasibility, management, and to provide access to credit for start-ups as well as to scale up the existing enterprises.
- **Aajeevika Grameen Express Yojana (AGEY):** AGEY is a programme to provide **safe, affordable, and community monitored transport services to rural areas**. The vehicles are owned and operated by members of SHG networks and operated in regions which are not served by regular transport services.
- **Rural Self Employment Training Institutes (RSETIs):** RSETIs are established in each district of the country to provide **short term residential training with long handholding support to the youth**.

#### Challenges before the Mission

- DAY-NRLM has been functioning in the mode of **'for the poor, of the poor and by the poor'**. It is a demand driven programme, which needs to focus more on **social mobilisation**. It requires **trained human resources** to build up the capacity of poor women in taking various activities at their levels.
- Due to **delay in the disbursement of funds**, various desired activities are adversely affected.
- The examples of **Kudumbashree** in Kerala, **Bihan Canteen and Bihan Outlet** run by SHGs in Chhattisgarh, **social audits** in Odisha by SHGs are positive developments. However, there is need to give more focus on the states like Manipur, Meghalaya

and Rajasthan for enhancing group activities for livelihoods.

- RSETIs should identify beneficiaries with due care and apply proper methods. The entire cycle from training, lending, handholding, etc. must be done carefully and systematically.

#### Conclusion

- The DAY-NRLM has been trying its best to unleash oppressed, depressed and suppressed energies of women by way of enabling them to take up micro enterprises individually and collectively.
- The assessments of the functioning of the Mission show that income levels of those who are engaged in the Mission have increased more than that of people not covered under it. However, there are some challenges before the Mission which need to be taken care of for better outcomes in future.

## 6) Boosting Rural Income

### Context

- The more industrialised a country is, not only are the wages and employment higher but so are other parameters of human development such as housing, healthcare, education, financial inclusion, besides supporting infrastructure such as connectivity and transport.
- For any rural industrialisation scheme to be successful it needs to have strong sustainable linkage with the agriculture sector. A strong linkage between farm and non-farm sectors can augment rural incomes and create jobs in rural areas.

### Initiatives by the Government

#### 1. SFURTI Scheme:

- The **Ministry of Micro Small and Medium Enterprises (MSME)** implements the Scheme of Fund for

Regeneration of Traditional Industries (SFURTI) across the country with the view to **organise traditional industries and artisans into clusters** to make them competitive and increase their income.

- Under the scheme, traditional artisans and industries are organised into clusters to add value to their production and enhance their income by supporting them.
- The Ministry has taken various initiatives like training on design development and product diversification to cater to the market demand, encouraging linkages with e-commerce portals, etc.
- Though **minimum wage for artisans is not specified under SFURTI**, necessary initiatives are taken under the scheme to upskill the traditional artisans and provide them with infrastructural support to add value to their products, thereby increasing their income in a sustainable manner.

## 2. Prime Minister's Employment Generation Programme (PMEGP):

- The **Ministry of MSME** has been implementing the PMEGP since 2008-09 through **Khadi and Village Industries Commission (KVIC)** as a nodal agency at the national level.
- It aims at generating self-employment opportunities in the country by **setting up micro-enterprises in the non-farm sector**, including cottage, khadi and village Industries units, thus helping traditional artisans and unemployed youth.
- Under PMEGP, General Category beneficiaries can avail of **Margin Money subsidy of 25 percent** of the project cost in rural areas and **15 percent** in urban areas. For

Special Categories such as SC/ST/OBC/minorities/women/ex-serviceman/physically handicapped/NER/Hill and Border areas, etc., the Margin Money subsidy is **35 percent** in rural areas and **25 percent** in urban areas.

- **Maximum project cost** for the manufacturing unit is **Rs. 50 lakh** and for the service sector it is **Rs. 20 lakh**.
- The scheme has been successful in generating rural employment spread across various social categories. Around 80 percent of the PMEGP units have been set up in rural areas and about 50 percent of the units have been set up by SC/ST/Women entrepreneurs.

### Programmes under KVIC

- Under **Gramodyog Vikas Yojana (GVY)**, KVIC is implementing the following programmes for **promotion and development of traditional industries**.
- **Bee-Keeping (Honey Mission)**: KVIC launched the Honey (Bee) Mission in 2017 for promoting beekeeping and generating employment in the beekeeping potential states of the country.
- **Pottery Programme (Kumhar Sashaktikaran)**: Under this programme, KVIC identifies the areas where clusters of traditional pottery workers are available and provides them training, electric pottery wheels and other tools.
- **Khadi Vikas Yojana (KVY)**: KVIC implements Khadi Vikas Yojana for the promotion and development of Khadi activities in the country.

### Conclusion

- Rural-urban linkages will be crucial in driving rural transformation, and ensuring that the fruits of industrialisation reach rural India. Strengthening rural-urban linkages

by connecting villages to small towns and big cities will benefit rural labour, production, distribution, markets and services, leading to creation of local, regional and global value chains.

## 7) Roadmap for Rural Industrialisation

### Context

- Over the years, India has witnessed a phenomenal increase in rural-to-urban migration due to declining opportunities in rural areas, dwindling returns from agriculture, and rapid urbanisation/industrialisation in cities.
- This has led to a mushrooming of **slum-clusters in cities, resulting in a severe strain on the urban infrastructure such as water, sewage, transport and on social resources.**
- After the **reverse migration** caused by the COVID pandemic, these skilled migrants are available in a cluster in rural areas. This can be leveraged to set up MSME units and provide them with credit, technical know-how and market support.

### Rural Industrialisation

- Rural Industrialisation includes **economic activities outside agriculture**, carried out in villages and varying in size from households to small factories like cottage, tiny, village, small-scale manufacturing and processing industries, and services of various kinds.
- Industrialisation in rural areas not only leads to **increase in per capita income and augmentation of living conditions** by generating appropriate employment opportunities for rural folks but also causes **reduction in income**

**disparities** between urban and rural areas thus ensuring social justice.

- Rural industrialisation is important not only for its **contribution to GDP** but also for its **stellar performance in exports.**
- The major advantages of rural industrialisation are as follows.
  - Small and cottage industries require **low capital investment**
  - Rural industries can take more advantage of **local resources**
  - **Transaction costs** can be avoided by catering to local demand
  - **Employment generation.**
- The **three way approach** which may help in increasing the rural industrialisation are:
  - **Agriculture diversification** by exploring the opportunities by farming completely a new range of grains, fruits or vegetables;
  - Establish **agro-food processing units or related units** like beverages production and many others;
  - **non-farm product business establishment** by promoting local rural artisan work.

### Government Initiatives

#### 1. ASPIRE:

- A Scheme for Promotion of Innovation, Rural Industries and Entrepreneurship (ASPIRE) was launched to **set up incubation centres and a network of technology centres** for enhancing entrepreneurship across India.
- The main objectives of the scheme are:
  - creation of new jobs and reducing unemployment,

- grassroots level economic development,
- promoting entrepreneurship culture in India,
- facilitating innovative business solutions for meeting the social needs of the people,
- promoting innovation for further strengthening the competitiveness in the MSME sector.

### 2. Pradhan Mantri MUDRA Yojana:

- Micro Units development and Refinance Agency Ltd (MUDRA) provides **refinance support to Banks for lending to micro units having loan requirement upto 10 lakh.**
- Launched in 2015, it provides its services to small rural and semi urban entrepreneurs outside the service area of regular banks, by using last mile agents.
- The three interventions under the scheme are:-
  - **Shishu:** covering loans upto Rs. 50,000
  - **Kishor:** covering loans above Rs. 50,000 and upto Rs. 5 lakh
  - **Tarun:** covering loans above Rs. 5 lakh and upto Rs. 10 lakh.

### 3. CGTMSE:

- Credit Guarantee Scheme for Micro and Small Enterprises (CGTMSE) is another initiative for reviving rural industries and entrepreneurship. It **facilitates credit to MSME units through collateral-free credit facility** (term loan and/or working capital) extended by eligible lending institutions to new and existing micro and small enterprises.
- The Ministry of MSME and Small Industries Development Bank of

India (SIDBI) jointly established a Trust named **Credit Guarantee Fund Trust for Micro and Small Enterprises** in order to implement Credit Guarantee Scheme for MSMEs. Seventy five percent of the loan amount to the bank is guaranteed by the Trust Fund.

- The scheme provides collateral-free loans up to a limit of **Rs. 200 lakh for individual MSMEs** on payment of a guarantee fee to the bank by them.

### 4. Stand Up India:

- This scheme is meant to provide **composite loans between Rs. 10 lakh to Rs. 100 lakhs** for setting up **Greenfield enterprises in the non-farm sector by SC/ST and women entrepreneurs.**

### Challenges

- Foregoing analysis shows that India has made sufficient achievements in industrial development during the last one decade but considering the size of rural India, concerted and continuous efforts need to be made.
- **Underutilisation of existing capacity** is a major challenge which is due to lack of power, raw material and demand, unsatisfactory labour relations, lack of capital and industrial raw materials are some of the problems which are hindering the overall industrial development in rural India.
- The entrepreneurs are **forced to take credit from village money lenders** who charge exorbitant rates of interest. As rural industries are labour intensive, they cannot afford to introduce sophisticated techniques and methods of production which are very expensive.
- **Lack of technical know-how, appropriate technology and**

**training** create immense problems in the growth of rural industries.

- **Procuring and storing raw materials** is a tough task for rural industries. Since rural industries are small-sized, they procure raw materials from **middlemen** at higher prices. **Lack of warehousing facilities** in the rural sector also costs more towards storing of raw materials.

### Way Forward

- To accomplish the goal of the **USD 5 trillion economy** as well as **AatmaNirbhar Bharat by 2025**, rural revitalisation requires a transformative approach that envisions making rural areas a better place to live and work.
- It will require creating an **enabling and favourable regulatory environment** to stimulate private sector investment in rural areas.
- A **strong linkage between farm and non-farm sectors** needs to be developed for augmenting income and creating jobs in rural areas.
- **Amul** is an excellent example of farm-led processing, branding and marketing of milk for various dairy products. Such a model should be replicated for other agricultural commodities in different parts of the country.
- **Collectivising farmers** through Farmers Producer Organisations (FPOs) would also offset scale disadvantages for small and marginal farmers and raise bargaining powers to enhance their incomes.
- The **role of MSMEs** is critical in rural industrialisation. MSMEs today provide employment to more than 111 million workers, with around 63.4 million units across the country contributing around 6.11 percent of the manufacturing GDP and 24.63 percent of the GDP

from service activities as well as 33.4 percent of India's manufacturing output. Their share in national gross value added is about 32 percent.

- Huge investment to create necessary infrastructure, effective institutions for enabling MSMEs to have access to technologies, finance and markets. Vocational education and skill development in manufacturing and business planning are required.

## 8) Export Potential of Rural Industries

### Context

- Rural industry plays a vital role in the Indian economy. Export potential of rural industries needs to be harnessed as it **contributes to foreign exchange earnings**, and also helps in **correcting deficits in balance of payments**.

### Sectors with High Export Potential

#### 1. Khadi and Handicraft Industries:

- The main items exported under khadi are ready-made garments, textile-based handicrafts, charkha, silk and muslin to US, Japan, UK, Canada and Middle East nations. In addition, there are other products like hand-made paper, leather, honey, papad, pickle, jam, jelly and herbal products which are also part of the export basket.
- Handicrafts constitute an important segment of the decentralised/unorganised sector of our economy. Presently, the sector is contributing substantially towards employment generation and exports, but this sector has suffered due to its **unorganised nature** along with additional constraints like **lack of education, capital, and poor exposure to new technologies, absence of market intelligence, etc.**

- Smooth provisioning of inputs and instruments along with artisans' welfare and marketing support will also need to be ensured for the growth of this sector.

## 2. Handloom Industries:

- The handloom sector is one of the largest unorganised economic activities and is an integral part of the rural and semi-rural livelihood.
- The sector has the advantage of being **less capital intensive, eco-friendly, has flexibility of small production, openness to innovations and adaptability to market requirements, requires minimal use of power, and has great export potential.**

## 3. PM-Mega Integrated Textile Region and Apparel Parks (PM-MITRA):

- The **Ministry of Textiles** has launched PM MITRA Scheme in 2021 to **strengthen the Indian textile industry** by way of enabling scale of operations, reducing logistics cost by housing the entire value chain at one location, attracting investment, generating employment and augmenting export potential.
- The scheme will develop an **integrated large-scale and modern industrial infrastructure facility** for total value-chain of the textile industry for example, spinning, weaving, processing, garmenting, textile manufacturing, and processing and printing, etc.

## 4. Coir Industries:

- Coir industry is a rural based agro-industry which has great potential for export. States like **Kerala, Tamil Nadu, Karnataka, Andhra Pradesh and Odisha** have a large potential in coconut products including coir.
- This industry **employs more than 75 percent women** and produces a wide range of coir products.

## Export Potential of Rural Industries

- The role and significance of export in the economic growth process is known as the '**export led growth hypothesis**'. This entails promotion of export in the global economy and acquiring foreign exchange reserves which will help in importing high-tech technology and services with greater multiplier effects.
- Hence, export is considered as a potent tool which leads to enhanced efficiency and better productivity in the long-run. In addition, it also provides a big push to skilled labour and use of advanced technology.
- Linking the production of these sectors to the export market is the best way to stimulate the rural economy and thereby facilitating connection with the agriculture market and open-up employment opportunities.

## Export Preparedness Index

- Export Preparedness Index is prepared by the **NITI Aayog** in partnership with the Institute of Competitiveness (a research institute in Haryana).
- The report examines **export preparedness and performance** of Indian states. EPI also intends to identify challenges and opportunities; enhance the effectiveness of government policies; and encourage a facilitative regulatory framework.
- The structure of the EPI includes **4 pillars: Policy; Business Ecosystem; Export Ecosystem; Export Performance.**
- The report aids the states to understand, introspect and implement policy and programmes in an export led development strategy.

### Way Forward

- Rural industries face inherent challenges like **inadequate advertisement and publicity, lack of suitable infrastructure and digital platform, high cost of raw materials, tariff and non-tariff issues, high transport and freight rate, and export credit issues, etc.**
- Main areas of improvement to make the rural industries export-friendly and sustainable are: **skill-building and training, technology upgradation, innovation, ease of access to credit, cluster development programme, marketing and digital presence, etc.**

## 9) Freedom Movement in Central India

### Context

- Even before 1857, the tribal people had revolted against the British in India time and again. Although the contribution of tribals was significant in the freedom movement that took place before and after 1857 across the country, the movements that took place especially in present-day Chhattisgarh in central India are touched upon here.

### Tribal Uprisings before 1857

- The **Halba rebellion** against the British (1774-1779) was marked by bloodshed and daring attacks. To capture Bastar, the British, with the help of the King of Jeypore and the younger brother of the King of Bastar, Dariyavdev Singh, formed a joint army and attacked **Ajmer Singh**, King of Bastar in 1774.
- Ajmer Singh's army of Halba tribesmen conclusively defeated the British army. This war lasted until 1779, but the British were not successful. Later, Dariyavdev Singh

killed Ajmer Singh by deceit. In this genocide, an attempt was made to wipe out the entire tribe. It can be said that this was the **first rebellion against the British in India**, and King Ajmer Singh of Bastar was the first martyr.

- Another significant rebellion began in the **Chota Nagpur region** in 1831, when **Kol tribesmen** rose in revolt because of the discontent arising from the forcible occupation of tribal lands. This rebellion lasted till 1832, and then the British suppressed it by deploying a big army.
- It was followed by another rebellion in **1833** when the British wanted to capture **Bargarh**. Under the leadership of **Ajit Singh**, ruler of Bargarh, the tribal people of Raigad fiercely opposed the British army. In this struggle, Ajit Singh was martyred.
- Another important rebellion took place in **Dantewada** in South Bastar in 1842 by the tribals against the order of the British regarding the **custom of human sacrifice**. The British army from Nagpur was called to suppress this revolt. After a struggle, the custom of human sacrifice was stopped and a permanent military system was established in Dantewada.
- The tribals resorted to these revolts to protect their culture and autonomy, which is the historical legacy of the freedom struggle against the British in Chhattisgarh.

### First Revolt of 1857 in Sonakhan

- In 1857, **Narayan Singh**, the tribal landlord of **Sonakhan of Raipur**, revolted uniquely. A drought occurred in his zamindari area. The paddy deposited with a moneylender was looted and distributed by Narayan Singh to save his people from starvation.

- On the complaint of the moneylender hoarding grain, Narayan Singh was arrested and imprisoned in Raipur jail. He managed to escape prison, and after reaching Sonakhan, he formed an army of tribal youth.
- The British sent a large army contingent to Sonakhan to arrest him. After fierce fighting, Narayan Singh was arrested and publicly hanged at Raipur in 1857. He was declared the **first martyr of 1857 in Chhattisgarh** by conferring the title of '**Veer**' in independent India.

### **Bhumkal of Bastar**

- In 1910, there was a fierce people's uprising in Bastar, known in modern history as '**Bhumkal of Bastar.**' The **Muria tribesmen** of Bastar defeated the British state and took up an armed revolution to establish the '**Muria Raj.**'
- Led by **Gundadhur**, this rebellion was meticulously planned and it rattled the entire Bastar region. The tribals targeted the British and attacked the government buildings.
- Initially, Muria Raj was established in the whole of Bastar for some time, but Gundadhur's army could not sustain itself against the large army of the British. Hundreds of tribal people were put to death in this struggle and thousands suffered harsh punishments.
- The Northeast region of Chhattisgarh witnessed the **Tana Bhagat movement**, which started in **1916** and lasted till 1918. In its initial phase, this movement was **violent** but later, the followers of this movement **joined the non-violent, non-cooperation movement** and became a part of the mainstream freedom movement of India.

### **Jungle Satyagraha**

- Another movement of Chhattisgarh– Jungle Satyagraha was launched in **1922** in a place named **Nagari of Dhamtari district**. The tribals had staged a 'satyagraha' against the authority, protesting over the low wages given by the forest department and the ban on carrying wood for use in cooking at home.
- Large-scale arrests were made in this movement, and satyagrahis were punished. Later, the Forest Department brought changes in its functioning, and this movement was called off. However, in **1930**, Jungle Satyagraha started again at different places in Chhattisgarh. This movement continued till 1931, and it ended with the comeback of the **Civil Disobedience Movement** in India.

### **Conclusion**

- The freedom movement is an analysis of the currents and counter-currents that formed the structure of the agitating society at that time. The collective consciousness of the people to be free was being expressed in the form of struggle, and it is necessary to recognise that consciousness and its expression. The history of India's freedom movement is incomplete without recognising the tribal consciousness.

## **10) Women's empowerment is about land ownership**

### **Context**

- Three-quarters of a century since India won its freedom, gender equality remains a distant dream.
- For women's empowerment to prove substantive from an economic point of view, **control over assets** is crucial. This is

especially so in the context of mass deprivation at the grassroots level.

### Scenario in India

- **Legal ownership of land** can make all the difference between poverty and the ability to escape it. This is why the **United Nations Sustainable Development Goals** require us to track the status of women's land rights. Sadly, though, the real picture on this remains unclear.
- Released last year, the fifth round of the **National Family Health Survey** for 2020-21 reported a drop in the ownership by country's women aged 15-49 saying they **owned a house or land (either solely or jointly) to less than a quarter from over a third back in 2015-16.**
- But not only does this survey club all forms of property and title rights together, its thin-slice sample and response variations put its **statistical validity in doubt.** Independent studies have thrown up even lower numbers.
- For a wide estimate, we must go back to the Census of 2011, which had dismal figures. **About 98 million women were found to be engaged in agriculture and allied activities, with most working as labour rather than cultivators.**
- **Land-owners** were a small subset of the latter, with **less than 13% of Indian farmland under female ownership.** This reflects a patriarchal scenario in which land-owning men migrate to cities, leaving their farms for womenfolk to work on.

### Significance of Land Ownership

- **Almost a third of rural households are estimated to be headed by women.** For them to **exercise legal authority**, however, the land they sow needs to be

registered in their name. At the very least, it would help them **obtain credit.**

- Land possession remains **largely dependent on inheritance and property rights** for women have been a long battle against our traditional patterns of **patrilineal succession.**
- A pre-1947 reform effort sought to assure widows a share in estate legacies, while the **Hindu Succession Act of 1956** laid down equal distribution of property among all inheritors, irrespective of gender, as the broad majority norm.
- This law was **amended in 2005** to specifically grant sons and daughters equal rights to joint-family property.

### Conclusion

- Disputes usually involve ancestral estates. But not all go to court, with women cheated of their due typically put under heavy family pressure to grin and bear it.
- The social dynamics that come into play over land contribute hugely to female deprivation. Unfortunately, reformist moves have achieved little in rural India. This is a vital part of all that we must fix if we are to empower women.

## 11) India's defence industry is spreading its wings overseas

### Context

- A leading defence PSU, Bengaluru-based Hindustan Aeronautics Ltd (HAL) has announced that it is opening an office in Malaysia.
- In Malaysia, HAL can sell its repair and maintenance services to that country, and also use the office as a gateway to the larger Southeast Asian market.

### The rise in defence exports

- India's defence exports were ₹1,941 crore in 2014-15. In 2021-22, they have jumped to **13,000 crore**. That's an **increase of more than six times**.
- According to the defence ministry, **70% contribution to exports in 2021-22 came from the private sector and the remaining 30% from the public sector**.

### Government Measures

- In **2011**, the government had announced a **Defence Production Policy** to achieve self-reliance in design, development and production of defence equipment; to create conditions conducive for the private industry to play an active role; to enhance potential of Small and medium-sized enterprises (SMEs) in indigenization; and to broaden the defence R&D base of the country. This policy was the beginning of India's defence export vision.
- What contributed to a rise in exports in the last few years were several steps taken by the government such as **simplifying licensing** for defence manufacturing and grant of no-objection certificates, **offering lines of credit** to small countries for purchase of arms, **import controls**, and **proactive role** played by India's foreign missions.

- A major push to exports comes through **increased indigenisation** which builds domestic manufacturing capacity. The government has issued three "**positive indigenisation lists**" in the last few years listing items that cannot be imported and must be procured domestically.
- **Offsets**, the requirement for a foreign seller of arms to India to reinvest part of the contract value in India, have also pushed defence exports.

### What does India export and to which countries?

- India mostly exports **parts and components, spares and sub systems**.
- The items India exports include personal protective gears, offshore patrol vessels, advanced light helicopters, SU avionics, radios and coastal surveillance systems, Kavach MoD II launchers, spares for radars, electronic systems and light engineering mechanical parts.
- Some of the **major export destinations** for India's defence products are the US, Myanmar, Sri Lanka, Italy, Maldives, Russia, France, Nepal, Mauritius, Sri Lanka, Israel, Egypt, UAE, Bhutan, Ethiopia, Saudi Arabia, Philippines, Poland, Spain and Chile.
- **In 2021-22, India's biggest importer was the US**. But in the preceding several years India's biggest importer has been **Myanmar** followed by **Sri Lanka**.

### Can India meet the high 2025 target?

- Encouraged by a rise in exports in the past several years, the government has set itself an **ambitious target of exports worth ₹35,000 crore by 2025**. India's exports in 2021-22 were ₹13,000 crore.

- Though India's defence exports have been going up, they are still meagre. India is now **among 25 top defence exporter countries, but its share in total global defence exports is just 0.2 per cent.** And it is the **biggest defence importer along with Saudi Arabia.**
- From 2017 to 2021, 50% of India's defence exports were to Myanmar, followed by Sri Lanka at 25%. That indicates **Indian manufacturers don't have access to more lucrative markets.**
- The government's focus on indigenisation will eventually be an effective solution to India's lopsided defence trade, but the question is how much India's defence PSUs can deliver. Before 2021-22, the **share of PSUs in India's defence exports was just 10 per cent,** the remaining 90 per cent being the share of private companies. In 2021-22, the exports were still dominated by the private sector at 70 per cent.

### Way Forward

- India last year **restructured 41 units under the Ordnance Factory Board into seven.** This will increase efficiency and accountability and more steps in that direction are needed.
- In addition to parts, components and spares, India needs to have several big export products. That would require **more funding for R&D** to begin with.

## 12) The freebies debate

### Context

- The Supreme Court wants a national debate on the rampant freebie handouts by states in India. The Court has wondered recently if we need a law to end the freebie culture.

### What are freebies?

- The **Reserve Bank of India (RBI)** defines freebies by **distinguishing them from public/merit goods, expenditure on which brings economic benefits,** such as the public distribution system, employment guarantee schemes, states' support for education and health.
- However, the RBI in a report said that, **free electricity, water, public transportation, waiver of pending utility bills and farm loan waivers** are often regarded as freebies, which **potentially undermine credit culture, distort prices through cross-subsidization** (practice of charging higher prices to one type of consumers to artificially lower prices for another group) **eroding incentives for private investment.**

### Positive Impacts

- While some freebies may have damaged the financial health of states, some experts have pointed out the **positive societal impact** in some instances.
- Studies have shown **free bicycles increased girls' participation in secondary schools by 30% in Bihar.**
- Political parties argue that **free laptops,** too, improve the quality of education and involvement of students in schools and colleges.
- Even the **Constitution** has mandated that **State secure a social order for the promotion of the welfare of the people and minimise and even eliminate inequalities** in income, status and opportunities (**Article 38**).
- The problem comes **when it becomes a burden on the State's finances.**

### Impact of freebies on the fiscal health of states

- Over the years, India has rolled out **product-based subsidies** (from food to fuels) and **people-oriented ones** (free electricity, water, farm loan waivers, etc.).
- Southern states like Andhra Pradesh and Tamil Nadu may do well on socio-economic indicators but still roll out many populist schemes. Politicians promise to offer the electorate free power, laptops, TVs and mobile phones before elections.
- Data from the **Comptroller and Auditor General of India (CAG)** shows that the State governments' expenditure on subsidies has grown by 12.9 per cent (in 2020-21) and 11.2 per cent (in 2021-22). The share of subsidies in total revenue expenditure by States has risen to 8.2 per cent in 2021-22 (from 7.8 per cent in 2019-20).
- For many states, the **debt growth has outpaced Gross State Domestic Product (GSDP) growth** over the last few years, observes RBI, pointing out that it's unsustainable. **Punjab, Rajasthan, Bihar, Kerala and West Bengal** are India's most indebted states.

### What is the solution?

- The Supreme Court has called for a national debate on the freebie culture in India, including the possibility of the Centre framing a law to control it.
- In 2014, the **Election Commission** added a **new chapter (chapter VIII) to its Model Code of Conduct to scrutinize poll manifestos**, and it has, on occasion, questioned political parties. But the powers that it drew by adding the chapter are both **vague and limited**. EC can at best censure a party.

- A law already exists to keep the Centre's and the states' spending on a tight leash—the **Fiscal Responsibility and Budget Management (FRBM) Act**. It only needs more teeth to become more effective.

### FRBM Act

- The FRBM Act came into effect in **2003, setting fiscal deficit targets** for the Centre and the states, eventually hoping to eliminate the revenue deficit. But the FRBM targets have been pushed back several times.
- After the Covid crisis, too, the government found it difficult to meet the mandated fiscal deficit target of 3% by 2020-21. The **fiscal deficit slipped to 9.5% in 2020-21 and about 6.8% in 2021-22**.
- **For states, the FRBM target is 3% of the GSDP**—for any relaxation from this target, states need the approval of the Centre.
- The FRBM has failed to control the spending of the Centre as well as the states for **two reasons**. First, it's **easy for the Centre to modify its FRBM targets**. It can do so by just making a mention of it in the Finance Bill, which outlines the taxation and spending plans of the government for the fiscal year.

### Lessons from the global experience

- **Debt ceilings are difficult to bypass in some developed economies**. Finance Minister Nirmala Sitharaman has called for **all government spending to be routed through the Budget**. That in itself would be a big reform.
- Unchecked, government spending on welfare schemes can often spiral out of control. The crisis in Greece, and its ripple effects in other parts of Europe, is one such example. The budget deficit of Greece exceeded 15% of its GDP in 2009 and

triggered the **eurozone debt crisis**.

### Conclusion

- The recent economic crisis in neighbouring Sri Lanka is a reminder of the critical importance of public debt sustainability.

## 13) Tapping technology to check minor mineral plunder

### Context

- With the increase in the pace of development, the demand for minor minerals such as sand and gravel has crossed 60 million metric tons in India. This also makes it the **second largest extractive industry** on the planet, after water.
- However, while laws and monitoring have been made stringent for the mining of major minerals consequent to the unearthing of several related scams across the country, the fact is that rampant and illegal mining of minor minerals continues unabated.

### Issue of Regulation

- Unlike major minerals, the regulatory and administrative powers to frame rules, prescribe rates of royalty, mineral concessions, enforcement, etc. are **entrusted exclusively to the State governments**.
- The Environment Impact Assessment (EIA) Notifications of 1994 and 2006 made **environmental clearance compulsory for mining in areas more than or equal to five hectares**.
- The EIA was **amended in 2016** which made **environmental clearance mandatory for mining in areas less than five hectares, including minor minerals**.
- The amendment also provided for the setting up of a **District**

**Environment Impact Assessment Authority (EIAA)** and a **District Expert Appraisal Committee (EAC)**.

### Under-estimated Minor Minerals

- There have been numerous cases of the **illegal mining of dolomite, marble and sand across States**. The problem of illegal mining of minor minerals is often **under-estimated**, thus accentuating undesired environmental consequences.
- Illegal mining causes copious **losses to the state exchequer**. For instance, as per an estimate, U.P. is losing revenue from 70% of mining activities as only 30% of the area is legally mined.

### Observations by Agencies

- The **United Nations Environment Programme**, in 2019, ranked **India and China** as the top two countries where illegal sand mining has led to sweeping environmental degradation. Despite this, there is no comprehensive assessment available to evaluate the scale of sand mining in India.
- Regional studies such as those by the Centre for Science and Environment of the Yamuna riverbed in Uttar Pradesh have observed that **increasing demand for soil has severely affected soil formation and the soil holding ability of the land, leading to a loss in marine life, an increase in flood frequency, droughts, and also degradation of water quality**.
- Such effects can also be seen in the beds of the Godavari, the Narmada and the Mahanadi basins.
- As has been pointed out in a study of the Narmada basin, sand mining has reduced the population of

Mahseer fish from 76% between 1963 and 2015.

### Judicial orders, State response

- Judicial orders are often **neglected by State governments**. A State-wide review of the reasons behind non-compliance suggests a malfunction of governance due to weak institutions, a scarcity of state resources to ensure enforcement, poorly drafted regulatory provisions, inadequate monitoring and evaluation mechanisms, and excessive litigation that dampens state administrative capacity.
- Protecting minor minerals requires **investment in production and consumption measurement and also monitoring and planning tools**. To this end, **technology** has to be used to provide a sustainable solution.

### Way Forward

- **Satellite imagery** can be used to monitor the volume of extraction and also check the mining process.
- Recently, the NGT directed some States to use satellite imagery to monitor the volume of sand extraction and transportation from the riverbeds. Well-planned execution of these directions increased revenue from minor minerals mining in all these States.
- Additionally, **drones, the internet of things (IoT) and blockchain technology** can be leveraged to monitor mechanisms by using **Global Positioning System, radar and Radio Frequency (RF) Locator**.
- State governments such as Gujarat and judicial directions such as the High Court of Madras have employed some of these technologies to check illegal sand mining.

Illegal extraction of Minor Minerals leads to irreparable losses to the Environment and revenue loss to the exchequer. Analyze suitable measures to overcome these challenges.

## 14) Launch a National Tribal Health Mission

### Context

- Nearly 11 crore tribal people (enumerated as Scheduled Tribes (ST) in the Census of India (2011) live in India. They constitute 8.6% of India's population, the second largest number of tribal people in any country in the world.
- A study published in The Lancet, titled '**Indigenous and Tribal Peoples' Health**' (2016), found that India held the inglorious distinction of having the **second highest infant mortality rate for the tribal people**, next only to Pakistan.

### State of Tribal People's Health in India

- The first **National Report on the State of India's Tribal People's Health** was submitted to the Government of India by the **Expert Committee on Tribal Health** in 2018.
- The picture was both pathetic and promising. Firstly, tribal people are concentrated in 809 blocks in India. Such areas are designated as the **Scheduled Areas**. However, the more unexpected finding was that **half of India's tribal population, nearly five and a half crore, live outside the Scheduled Areas, as a scattered and marginalised minority**. They are the most powerless.
- Second, the **health status of tribal people has certainly improved** during the last 25 years as seen in the decline in the under-five child mortality rate from 135 in 1988 in the National Family Health Survey

(NFHS)-1 to 57 in 2014 (NFHS-4). However, the **percentage of excess under-five mortality among STs compared to others has widened.**

- Third, **child malnutrition is 50% higher among tribal children:** 42% compared to 28% among others.
- Fourth, **malaria and tuberculosis are three to 11 times more common** among the tribal people. Though the tribal people constitute only 8.6% of the national population, half of the total malaria deaths in India occur among them.
- Fifth, while malnutrition, malaria and mortality continue to plague tribal people, gradually, the **more difficult to treat non-communicable diseases** such as hypertension and diabetes, and worse, mental health problems such as depression and addiction leading to cancer and suicide, **are increasing.** These threaten the health and survival of tribal adults.
- Sixth, **tribal people heavily depend on government-run public health care institutions,** such as primary health centres and hospitals, but there is a **27% to 40% deficit in the number of such facilities, and 33% to 84% deficit in medical doctors** in tribal areas. Government health care for the tribal people is **starved of funds as well as of human resources.**
- Seventh, there is **hardly any participation of the tribal people** – locally or at the State or national level – in designing, planning or delivering health care to them.

#### Road Map

- The expert committee also prepared a road map for the future which includes a large number of recommendations.

- Firstly, the committee recommended launching a **National Tribal Health Action Plan** with a goal to bring the status of health and healthcare at par with the respective State averages in the next 10 years.
- Second, the committee suggested nearly **80 measures** to address the 10 priority health problems, the health care gap, the human resource gap and the governance problems.
- Third, the committee suggested **allocation of additional money** so that the per capita government health expenditure on tribal people becomes equal to the stated goal of the **National Health Policy (2017)**, i.e. **2.5% of the per capita GDP.**

#### Way Forward

- The tribal healthcare system is sick, and tribal people need more substantive solutions. We need to move from symbolic gestures to substantive promises, from promises to a comprehensive action plan, and from an action plan to realising the goal of a healthy tribal people.
- If actualised, the Tribal Health Mission can be the path to a peaceful health revolution for the 11 crore tribal people. India needs to demonstrate to them that democracy offers a caring solution to their wounds.

### 15) Working towards animal health

#### Context

- India has a livestock population of 1.6 billion that in turn translates into a scenario where approximately 280 million farmers rely on livestock and related industries for livelihood.

- From the perspective of trade, the dairy industry in the country is valued at \$160 billion, while the meat industry is valued at \$50 billion.
- In addition, livestock and related activities have significant overlap with wildlife and humans.
- In the current atmosphere of climate change and unpredictable weather, animal husbandry assumes significance as a source of reliable income to farmers.

### Increase in Zoonotic Diseases

- Statistics indicate that globally, we have witnessed around 9,580 instances of disease outbreaks from 2000 to 2010, of which **60% diseases were zoonotic in nature** (type of disease passes from an animal or insect to a human).
- In India, we see that annual outbreak of zoonotic diseases translates into an estimated **annual loss of \$12 billion to the economy**.
- Thus, these diseases are responsible for huge consequences to farmers, exports and gross domestic product (GDP) growth nationally.

### Government Response

- The **Department of Animal Husbandry and Dairying (DAHD)** in Government of India has been working towards increased investment in preparedness to protect health and building economic resilience so that India could become a world leader in animal pandemic preparedness.
- To this end, the Department has set up a dedicated '**One Health Unit**'. One of the primary focus areas of the unit has been on coming up with an "**animal pandemic preparedness**" model by creating a mechanism for storage and seamless exchange of data and

information on livestock health — this will be implemented through the **National Digital Livestock Mission (NDLM)**.

- *NDLM is a digital platform being developed jointly by the DAHD and National Dairy Development Board (NDDB). Goal of NDLM is to build a connected livestock disease programme that can integrate with wildlife and human disease systems to inform us about the movements and control of zoonotic diseases.*
- So far, synergies from advances in human vaccines have not been leveraged in animal vaccine development.
- To incentivise the growth of the animal health industry in India, companies can now avail incentives for setting up or expansion of animal vaccine and related infrastructure under the **Animal Husbandry Infrastructure Fund**.
- Additionally, DAHD in collaboration with the Office of the Principal Scientific Adviser, Central Drugs Standard Control Organisation (CDSCO), Indian Council of Agricultural Research (ICAR), and the Indian Pharmacopoeia Commission (IPC) has set up an **Empowered Committee for Animal Health** to streamline the animal health regulatory ecosystem in the country.

### Creating a successful model

- To create a robust pandemic preparedness model, it is imperative to juxtapose the data on animal health with the available data on human health.
- Within the framework of the NDLM, so far, substantial progress has also been made by **linking all the animal disease diagnostic labs**

involved in sero-surveillance through a single portal.

- This pandemic preparedness initiative would thus enable the linking and comparison of real-time information regarding diseases between wildlife and human systems — that would create a reliable mechanism for forecasting disease outbreaks.

### Way Forward

- This India-focused initiative will also present a good starting point to lead global pandemic preparedness effort because this threat is faced by other countries as well, including developed economies.
- The dynamic model under preparation would further result in enhanced disease surveillance so that we are better prepared before the next outbreak hits.

## 16) The coming 75 years

### Context

- India spends a meagre **0.7% of its GDP on research and development (R&D)**.
- **Increasing the R&D budget to 4%** of the nation's GDP, will shift the focus to science and technology and thereby contribute to a higher standard of living for every citizen.

### Strengthening infrastructure

- Spending 4% of the national GDP on R&D is required to **drive science and innovation**.
- **Israel and South Korea** are prime examples that drive their respective economies by spending nearly 5% of their GDP on R&D.
- However, an increase in the science budget to innovate must precede **appropriate macro-level policy changes on how and where the money needs to be spent**.
- A part of this increase needs to be **earmarked for building physical and intellectual infrastructure**

across the country, especially in the universities.

- A first-class infrastructure must be accompanied by **well-trained, globally competitive institutional administrators and processes**.
- India cannot compete on a global stage unless the dwindling infrastructure of its universities is upgraded.

### Role of Institutions

- Before any policy changes take effect, individual institutions must implement processes to accommodate the large budget. This requires **standardising procedures across institutions and borrowing the best practices from some global counterparts**.
- For example, when the government encourages public-private partnerships, each grant-receiving institution must have **internal procedures** to handle their scientists' requests to facilitate effective academia-industry collaboration.
- Although there is a well-defined system to disburse research grants to scientists through their institutions, it is **mired in inefficiencies**.
- **Inadequate staffing at funding agencies, lack of transparency in fund disbursement, lack of a rigorous international standard review and feedback process, excessive delay in fund disbursement, and an outdated appraisal system** are holding our scientists back.

### Science for the masses

- The fruits of science and technology must be brought closer to the masses. There is no better way to do this than by **promoting and facilitating individual entrepreneurs**.

- This has received increased attention from the government with many positive policy changes.
- There are no better cradles for creative ideas than our university labs. A **robust system to link the labs with the entrepreneurs** to funnel innovative ideas, products, and solutions to our society needs to be in place.
- To make this happen, the universities must encourage scientists to innovate and place standardized procedures to take ideas out of labs.
- Entrepreneurship will only succeed in India if it is backed by a funnel of ideas and a liberal process of taking those ideas out of our university labs.
- The two sides adopted a **Joint Action Plan** in **2005** towards strengthening dialogue and consultation mechanisms in the political and economic spheres, enhancing trade and investment, and bringing peoples and cultures together.
- The 15th India-EU Summit, in 2020, provided a common road map to guide joint action and further strengthen the partnership over the next five years.
- The road map highlights **engagement across five domains**: foreign policy and security cooperation; trade and economy; sustainable modernisation partnership; global governance; and people-to-people relations.

#### Way Forward

- By ensuring that individual institutions implement processes to accommodate the large budget, encouraging individual entrepreneurs and linking science with society, India can make true progress in achieving a higher standard of living for every citizen.

### 17) A road map for India-EU ties

#### Context

- While India celebrates its 75th year of Independence, it also celebrates 60 years of diplomatic relations with the European Union (EU).

#### Evolution of Relations

- A cooperation agreement signed in 1994 took the bilateral relationship beyond trade and economic cooperation.
- The **first India-EU Summit**, in June 2000, marked a watershed in the evolution of the relationship.
- At the **fifth India-EU Summit** in 2004, the relationship was upgraded to a **'Strategic Partnership'**.
- Beyond the economic partnership, India and the EU have several avenues of collaboration. For example, the **'green strategic partnership'** between **India and Denmark** aims to address climate change, biodiversity loss and pollution, and the **India-Nordic Summit** in May focused on green technologies and industry transformation that are vital for sustainable and inclusive growth.
- All this will act as a catalyst for enhanced cooperation between the two regions.

### Defence Cooperation

- Cooperation with the EU in the **defence sector** has also increased substantially. This is critical for India at this juncture, to **reduce its hardware dependence on Russia** in the backdrop of the Ukraine conflict and seek **diversification of its armament imports** from other regions with latest technologies in wake of its confrontation with China.
- India and the EU regularly conduct **joint military and naval exercises** which reflects on their commitment to a **free, open, inclusive and rules-based order in the Indo-Pacific**.
- **France's** on-time delivery of 36 **Rafale fighter jets** and willingness to offer **Barracuda nuclear attack submarines** to the Indian Navy reflects the growing level of trust in their relationships.
- Leading European defence equipment manufacturers are willing to partner with Indian companies for defence projects aligned with the 'Make in India' programme.

### Other Areas

- Another rapidly growing area of engagement is the **start-up and innovation ecosystem** across India and Europe.
- In 2020, there was an **agreement for research and development cooperation in the peaceful uses of nuclear energy** between the European Atomic Energy Community and the Government of India.

### Challenges

- India's **reluctance to explicitly condemn Russia's intervention in Ukraine, and the country's increasing economic cooperation with Russia**, has been one area of disagreement.

- **India has called out the EU's double standards on the same**, for the EU purchases 45% of its gas imports from Russia in 2021.
- There is also **ambiguity on the EU's strategy in tackling the rise of China**. Its muted response during the **Galwan clash** is a case in point.

### Way Forward

- India and the EU should not let such divergences of views overwhelm the many areas of convergence among them.
- The proactive resumption of negotiations for the ambitious **India-EU free trade and investment agreement** is a step in the right direction.
- European partners acknowledge India as an important pillar in ensuring stability in the Indo-Pacific region.
- The EU wants to be more than just a trading bloc and is seeking alliances with like-minded countries like India.

## 18) Making out a case for the other UBI in India

### Context

- As the importance of social security came into focus after the major waves of the pandemic, the debate on **universal basic income (UBI)** began to resurface in policy circles across the globe.
- However, there is another UBI that needs to be examined in the Indian context, i.e., **universal basic insurance**.

### Types of security nets

- **Income shocks** result in a free fall of those living on the line of **basic living wages** (say line 1) down towards the **critical survival line** (say line 2). In any case, a fall that is further below line 2 needs to be prevented as it can be catastrophic

- a household can end up facing a **poverty trap**.
- **Social security systems are like a safety net placed at line 2.** These social security nets can be of **three types**.
  - The first is a **passive safety net** which catches those falling from line 1 and prevents a fall below line 2. It is basically a **social assistance programme** meant for the most income-deprived sections of society.
  - The second is an **active safety net** which works like a trampoline so that those who fall on it are able to bounce back to line 1. It includes schemes with a **higher outlay**.
  - The third is a **proactive safety net** which acts like a launchpad so that those who fall on it will not only bounce back but will also move up beyond line 1. It is the **most desirable option** but requires **immense resources and institutional capacity**.

### Social Security

- For social security, people on the south end of the income line need **social assistance schemes**. Those on the north end of the income line should have **voluntary insurance**.
- Social security mainly encompasses **food security, health security and income security**.
- India operates the widest spectrum of social security schemes which cater to the largest number of people than any other country.

### Food Security

- The Indian food security programme, for example, has over **800 million beneficiaries** being provided heavily subsidised food

grain under the **National Food Security Act (NFSA)**, the world's largest food security programme.

- About 120 million children are provided free lunch under the **Mid-Day Meal Scheme**.
- In addition, some 50 million people benefit from the free meals programme run by a few State governments. Nevertheless, there are **issues of financial sustainability and leakages** in the food security programme.

### Health Security

- On the health security front, for the unorganised sector, there is the **Ayushman Bharat Scheme** of the central government with over 490 million beneficiaries.
- In the organised sector, the Central government runs the **Employees State Insurance Corporation (ESIC)** and **Central Government Health Scheme (CGHS)** catering to 130 million and four million beneficiaries, respectively. Health insurance schemes run by various State governments cover about 200 million people.
- Only about 110 million people in India have **private health insurance**. Despite these large-scale provisions, **about 400 million Indians are not covered under any kind of health insurance**.

### Income Security

- Income security is the trickiest part to tackle in the social security basket.
- For the **organised sector**, there are **three types of provident fund schemes**:
  - **General Provident Fund (GPF)** which is availed by about 20 million Central and State government employees in the country.

- The second is the **Employees' Provident Fund (EPF)** which is availed by about 65 million workers in the other organised sector.
- The third is **Public Provident Fund (PPF)** that can be availed by any Indian citizen but has contributions from the organised sector mostly.
- There are about 53 million **New Pension Scheme** subscribers in the country (about 2.2 million in the Central government, 5.6 million in the State government and the rest in the private sector).
- In the **unorganised sector**, the **Pradhan Mantri Kisan Maandhan Yojana (PM-KMY)** and the **PM-KISAN** scheme is availed by about 120 million farmers. **Atal Pension Yojana (APY)** benefits 40 million people.
- The **Pradhan Mantri Shram Yogi Maandhan Yojana** has about five million beneficiaries while there are about 50,000 beneficiaries under the **National Pension Scheme for Traders and Self-Employed Persons (NPS-Traders)** scheme.
- The largest unorganised sector income security programme is the scheme under the **Mahatma Gandhi National Rural Employment Guarantee Act**, which has about 60 million beneficiaries.
- Out of 500 million workers in India, **about 100 million have no income security** (pension, gratuity or other income) coverage.
- **Note:**
  - Pradhan Mantri Kisan Maandhan Yojana is a government scheme meant for **old age protection and social security of Small and Marginal Farmers (SMF)** having cultivable landholding **up to 2 hectares**. It is a voluntary and contributory pension scheme, under which the subscriber would receive a **minimum assured pension of Rs 3000/- per month** after attaining the age of 60 years.
  - Under the PM Kisan Yojana, **income support of Rs 6000 per annum** is provided to all eligible farmer families across the country in three equal installments of Rs 2,000 each every four months.
  - Atal Pension Yojana addresses the **old age income security of the working poor**. It is focused on the **unorganized sector workers**. It offers **fixed pension** for the subscribers ranging between **Rs.1000 to Rs. 5000**.
  - Pradhan Mantri Shram Yogi Maandhan Yojana is a government scheme meant for **old age protection and social security of Unorganized workers**. It is a voluntary and contributory pension scheme with a provision of payment of **Rs. 3000/-** monthly pension on attaining the age of 60 years.
  - NPS-Traders scheme is meant for **old age protection and social security of retail traders/shopkeepers and self-employed persons** whose **annual turnover is not exceeding Rs. 1.5**

**crore.** It is a voluntary and contributory pension scheme, under which the subscriber would receive a **minimum assured pension of Rs 3000/- per month** after attaining the age of 60 years.

#### Feasibility of Universal Basic Income

- Universal basic income is the concept under which **all citizens of a country receive a legally stipulated and equally set financial grant** paid by the government.
- However, besides **huge fiscal implications** (around 4.5% of GDP), the proposal of universal basic income runs the **risk of implementation failure due to large-scale beneficiary identification requirements.**

#### Way Forward

- The other UBI, i.e. **universal basic insurance**, is a better proposition for two reasons.
  - One, the **insurance penetration** (premium as a percentage of GDP) **in India** has been hovering **around 4%** for many years compared to 17%, 9% and 6% in Taiwan, Japan and China, respectively.
  - Two, though the economy largely remains informal, **data of that informal sector are now available** both for businesses (through GSTIN, or Goods and Services Tax Identification Number) and for unorganised workers (through e-Shram, which is the centralised database of all unorganised workers).
- Till the Indian economy grows to have adequate voluntary insurance, social security can be boosted through the scheme of universal basic insurance.

## 19) The implications of the 5G roll-out for law enforcement

### Context

- Prime Minister Narendra Modi recently announced that 5G deployment in India will commence sooner than expected.
- The long-awaited upgrade from 4G to 5G will allow **ultra-fast Internet speeds and seamless connectivity** across the country compared to 4G.
- The implications of the 5G roll-out could be significant, particularly for **law enforcement in India.**

### Ensuring security

- The 5G roll-out is set to **enhance efficiency, productivity, and security** by helping the police access critical information in real-time and nab criminals.
- 5G has **high bandwidth and low latency**, so its adoption would ensure the best performance of police devices such as body cams, facial recognition technology, automatic number-plate recognition, drones, and CCTVs.
- 5G promises to transmit clearer images. This will simplify the task of the police who, at present, often look at hazy images from devices and attempt to decipher them while working on cases.
- The **increased storage capacity** promised by 5G will allow the police to streamline their investigation methods.
- 5G will also allow **rapid and secure communication** within the organisation as well as between civilians and emergency responders.
- With 5G, the police can remotely **access and analyse crime data and information from other infrastructure** such as traffic lights.

### Challenges in adopting 5G

- Deploying 5G when we have a **shaky cyber security foundation** is like erecting a structure on soft sand.
- The 5G network is **susceptible to cyber threats** such as botnet attacks, man-in-the-middle attacks, and distributed denial-of-service (DDoS) overloads.
- Besides, as 5G lacks end-to-end encryption, hackers can plot their attacks more precisely and perpetrate cybercrimes by hacking into systems or disseminating illegal content.
- The **bandwidth expansion due to 5G will enable criminals to embezzle data bases easily**. With time, as 5G connects with additional devices, the **frequency of attacks could increase**.
- Criminals could use 5G to **conceal their activities or mask their location**. They could use 5G to locate their victims quickly and track their movements and coordinate onslaughts through real-time communication with each other.
- There could be a **lower probability of criminals getting caught** when they commit identity theft or credit card fraud or steal information from computers, smartphones and tablets.
- 5G may also make it easier for criminals to **perpetrate cyber bullying**.
- They could also **hack into Internet-of-Things (IoT) devices and remotely commit crimes**.
- **Training programmes focusing on such crimes** must be developed. This includes identifying potential scenarios for new types of crimes and their prevention.
- The government and telecom companies could think of setting up a **5G crime monitoring task force** to monitor and identify new crimes and develop countermeasures.
- Regulations may also require telecom companies to **allow police officers access to their equipment to track the location** of victims and perpetrators of 5G-facilitated crimes for countermeasures.
- These countermeasures may not only safeguard critical infrastructure but also defend private citizens from cyber-attacks using 5G technology.
- Finally, law enforcement agencies will have to **evolve strategies to identify victims of 5G-facilitated crimes, locate them and take action** against the perpetrators of such crimes.

### Way Forward

- The 5G roll-out will be a game-changer for law enforcement agencies. It will enable the police to fight crime effectively. At the same time, criminal use of 5G is inevitable.
- In this context, the recent recommendation of the **Telecom Regulatory Authority of India** to the government to develop a **national road map for India** to implement 5G in the best possible manner should encompass law enforcement requirements.

### Fighting new-age crimes

- The authorities will have to adopt measures to hinder crimes facilitated by 5G technology.
- The **police will need to be trained** so that they recognise new 5G-enabled crimes.

**20) Net zero is net positive for profits, people, and planet**  
Context

- There is a worry that decarbonisation will impede the country's development because
  - coal-based energy cannot be replaced by solar
  - electric cars are too expensive
- Simply put, low-carbon emissions (green) technologies are considered to be worse than high-carbon, fossil-fuel based (brown) technologies.
- However, if green technologies are more cost-effective than brown technologies, then development pathways that take us to net zero emissions will be good for India.
- Market-driven approaches will power these pathways and Net zero will be net positive for profits, people, and the planet.

### Adverse Impacts

- Current policies are likely to lead to a **2-3 degrees centigrade rise in global mean temperatures by 2100** and India will be devastated by such rapid warming.
  - **Droughts, floods, coastal flooding, glacial melting, and heat waves** will damage our economy and stall job creation.
  - **Extreme weather events** will destroy vital infrastructure and require massive investments in disaster management.
  - **Sea level rise** will threaten many of our coastal cities.
  - Comparing a 2-3 degree warming to 1.5 degree warming, **India's gross domestic product could be 10-20 per cent lower.**
- In addition, fossil fuels are leading to highly destructive **air pollution** across our cities which is killing 1-2 million people per year.

- While the world is pursuing net zero emissions by 2050, India's fossil fuel-dependent economy is likely to cross 7 billion tonnes of carbon-equivalent emissions by 2050.

### Green Technologies

- Our net zero pathways require **massive and immediate investments in green technologies** such as solar and wind power, electric mobility, green hydrogen, and plant proteins.
- But Green technologies are believed to be more expensive than brown technologies, to which Bill Gates has used the term **green premium**.
- However, innovative Indian businesses have transformed the green premium into a **green discount**.
  - Round-the-clock **solar power** is now being delivered at prices **20-30 per cent cheaper** than coal-fired thermal power plants.
  - **More than 90 percent of auto-rickshaws being sold in India are now all-electric** which are cheaper to operate and also cost less than fossil fuel-based rickshaws.
  - **All-electric fleets using Indian electric vehicles (EVs)** are providing much cheaper rides to commuters than diesel and petrol cabs.
  - **Sugarcane mills are being repurposed to produce ethanol** that will be mixed with imported fossil fuels to bring down prices.
  - **Significant subsidies** are also available for rooftop solar, electric vehicles, and charging networks.

- These incentives ensure that green technologies will become even more **cost-effective** spurring India's vibrant start-up ecosystem to develop even better solutions. As we begin to promote more and more green unicorns, entirely new green industries will emerge that will enable rapid decarbonisation.
- Adoption of cost-effective green technologies, accelerated by supportive government policies, will lead to massive technology shifts across the Indian economy.

### Way Forward

- Detailed modelling studies have shown that **India needs to invest \$50-100 billion per year to get to net zero emissions** by mid-century.
- Private sector capital will spur **green entrepreneurship**. These return-generating investments will drive even more capital deployment into green technologies, and market forces will then drive India's net zero pathway.
- Pursuing net zero will therefore result in **much faster GDP growth, more job creation, lower air pollution, better balance of payments, and a more resilient economy for India**.

## 21) Focus on nutrition

### Context

- The month of September is observed as "Poshan Maah" (nutrition month) every year, this is the right time to draw attention to the need for a balanced and diversified diet among all classes of the population.

### State of Food Security and Nutrition

- Though the country has made noticeable progress in alleviating starvation, **malnutrition is still pervasive**.

- The **United Nations (UN) report** titled "**State of Food Security and Nutrition 2022**" has indicated that even though the **number of undernourished people in India** has **declined** from 247.8 million in 2004-06 to around 224 million in 2019-21, the **count of anaemic children and women, as also of overweight people, is still disquietingly high**.
- The findings of the **5th National Family Health Survey**, conducted in 2019-21 also showed that **while over half the children and women were anaemic, the incidence of obesity was on the rise among both men and women**.

### Skewed Consumption Pattern

- This is a perturbing state of affairs because:
  - India is one of the world's major producers and exporters of food.
  - It is the world's **second-largest producer of fruit and vegetables, after China**.
- The country's vast public-distribution network along with other food-based welfare programmes covering nearly two-thirds of the population has failed to deliver to its potential. This is because of its **narrow focus on supplying primarily the belly-filling cereals**.

### Advantages of Millet Consumption

- The **root cause of malnourishment** is not so much the inadequacy of food but its **skewed consumption, tilted towards cheaper (subsidised) cereals**, notably wheat and rice, rather than the **relatively nutritious coarse grains like millets**.

- A recent study by seven organisations under the leadership of the Hyderabad-based International Crops Research Institute for Semi-Arid Tropics points out that:
  - Regular consumption of millets can **improve hemoglobin levels;**
  - **Reduce anemia-causing iron deficiency;**
  - **Meeting all or most of the daily nutritional requirements** of an average person.

### Way Forward

- India, the **world's largest producer of millets**, has been instrumental in getting the UN General Assembly declare 2023 the "**International Year of the Millets**".
- The country, therefore, must lead the world in showing the ways and means to boost their production and consumption and their value-added products.
- The ultimate objective should be to **make millet products part of the modern food platters** to combat malnutrition in a cost-effective manner.

## 22) Water-wisdom for climate change

### Context

- We need to get the policy and practice of water management right because
  - One, water is a **key determinant of health security and economic growth.**
  - Two, **water wars** are not inevitable but will happen if we do not manage our resources prudently.
- Over the past decades, the country has learnt critical lessons on water

management and has evolved a new paradigm.

### Evolution of water management policy

- **Till 1980s** policy focus was on **irrigation projects:**
  - There was an emphasis on the construction of dams and canals.
  - Goal was to store and supply water over long distances.
- **Late 1990s** saw beginning of policy of **decentralized water management:**
  - States launched massive programmes to capture rainwater by building ponds, digging tanks, and setting up check-dams on streams.
- With the crisis of urban drought in the 2010s, Policy emphasized on
  - **Augmenting water supply** as
    - Dependency on long-distance sources meant pumping and piping water leading to losses in distribution and rising electricity costs;
    - Ponds and tanks in the city were almost destroyed by real estate;
    - People turned to groundwater, but without recharge it only meant declining water levels.
  - **Addressing the water pollution**
    - Available water was expensive and its supply inequitable;
    - Dependency on long-distance sources meant pumping and piping water leading to losses in distribution and rising electricity costs;

- Ponds and tanks in the city were almost destroyed by real estate;
- People turned to groundwater, but without recharge it only meant declining water levels.

#### Approach to ensure water-security

- Increased focus on **local water systems** like ponds, tanks, and rainwater-harvesting structures is crucial.
- Measures are required to ensure **affordable sanitation for all** and put in place **affordable treatment of wastewater**.
- Government should focus on **re-engineering on-site waste collection systems** in a way waste can be collected from each household, transported, and treated.
- Other measures include **investing in water-efficient irrigation and household appliances, changing diets** to ensure that the crops we eat are water-prudent and **protecting our forests and green spaces** as this is how groundwater gets recharged.

#### Conclusion

- In times of water stress, we must make sure that wastewater is not only treated but also recycled and reused. Only this approach can make us water-secure.

## 23) Chips for growth

#### Context

- The last three years have seen the **value chain for semiconductor chips drastically disrupted** which has affected the supply of **neon**, a gas that's key for the semiconductor manufacturing process.
- In this context, India's attempt to enter the global semiconductor market with a **government**

**commitment of \$10 billion** is well-timed.

#### Scenario in India

- India has some major advantages in entering this space.
  - First, India has a **strong background and plenty of skills and experience** in chip design.
  - Second, it has a **large domestic market**.
    - In the coming days, **5G** will enable high-speed internet and support a big expansion in enterprise and consumer-related applications such as IoT, thus creating new demand for chips.
    - India has a **large automobile industry** which has suffered from chip shortages.
    - Domestic semiconductor production could also provide a boost to the burgeoning **aerospace-defence sectors** and enable **local mobile handset manufacturing** to move up the value chain.

#### Challenges

- Some of the issues and challenges are generic while others are specific to the semiconductor industry.
  - The semiconductor manufacturing industry requires **massive scale to make it economically sustainable**.
    - It is a **highly concentrated industry** with only about 15 companies possessing the skills and scale to be

- significant global players.
  - The policy commitment of \$10 billion and assurances of support **may not be enough.**
- **Infrastructure lacunae** can retard production.
  - Chip manufacturers require **massive amounts of absolutely pure water, and rock-steady, totally reliable power supply.**
  - India is **water-deficient**, and the **water quality is poor** in most places.
  - Any semiconductor foundry will need **captive power generation capacity, and large-scale in-house water purification systems**, which may be a criterion that narrows down choice of possible locations.
- **Delays in land acquisition** for all sorts of projects is another major challenge.
- **Delays in environmental and other statutory clearances** also affect India's competitiveness.

### Conclusion

- Policymakers will have to take note of these issues and challenges and tackle them head-on to create a sound base for domestic semiconductor manufacturing.

## 24) The road to energy atma nirbharta

### Context

- The Prime Minister has called for "Energy Atmanirbharta" by 2040.

### 10 suggestions to achieve the objective of Energy Atma Nirbharta

- To have **definitional clarity**
  - Atmanirbharta translates literally to **self-reliance** but many interpret it to mean self-sufficiency.
  - In the Energy field self-sufficiency is infeasible and uneconomic. A better statement of intent would be "**strategic autonomy**".
- Prioritise **access to fossil fuels**
  - The transition to a green energy system will take a **longer duration**. Our policy must continue to emphasise on **affordable and secure access to oil and gas**.
  - **Intensifying domestic exploration** and carrying out production in commercially viable terms and **involving private players** in this high-risk, capital-intensive activity are necessary.
- Prioritise **access to the building blocks of green energy**.
  - The **Central Electricity Authority (CEA)** has forecast that wind and solar energy will make up around 51 per cent of the installed power generation capacity of 830 GW by 2030.
  - The sine qua non for realising this forecast will be **cost-competitive access to minerals/components** such as copper, cobalt, lithium, semiconductor chips etc required to build EVs, solar panels, wind turbines and batteries.
  - A study by S&P Global has noted, for instance,

- 38 percent of copper is produced from **Chile and Peru**
  - **China** controls 47 percent of copper smelting and 42 percent of copper refining.
- The problem is these commodities are **concentrated in countries that are not on the same political page with India**. For example Chile and Peru have left-wing governments unreceptive to private sector mining.
- India has some resources such as **cobalt, nickel and heavy rare earth metals** but it has done little to expedite their mining and processing. India should **remove the obstacles to domestic mining and develop strategies** to manage the dynamics of market concentration, global competition and unfavourable geopolitics.
- **Infrastructure development**
  - The European economic powerhouse, Germany, has been left in peril by the sudden lack of Russian gas after the **closure of Nord Stream 1**, which runs from Vyborg, north-west of St Petersburg, under the sea to Germany's Baltic coast.
  - India cannot afford such vulnerability. GAIL is investing in the development of a **national gas pipeline grid**.
  - It is important to **expand our strategic petroleum reserves to cover at least 30 days of consumption**.
- **Green incentives**
  - The government's **production-linked incentive scheme (PLI)** offers benefits for investment in green energy. The investor response has so far been encouraging.
  - Other governments are also going down a similar route and are also looking to attract private capital to help them meet their **net carbon zero targets**.
  - For example: The US Chips and Science Act has offered, for instance, tax credits and subsidies that are a multiple of that offered under PLI. We may have to go back to the drawing board to retain the interest of potential investors.
- **Demand conservation and efficiency**
  - Energy usage norms must be standardised and tightened. Legislation should be contemplated to ensure compliance.
- **Retraining and upskilling**
  - The nature of jobs and their location will change with the progressive transition to a green energy system.
  - The consequential requirements for training/skilling should be anticipated and delivered.
- **Energy diplomacy**
  - Because of our dependence on the international energy supply chains, success in navigating the cross-currents of economic and geopolitical uncertainties will rest greatly on skilful diplomacy.

- **Holistic governance**
  - The current siloed structures of energy governance are suboptimal.
  - Institutions should be created to facilitate **integrated energy planning and implementation.**
- **Political statesmanship**
  - We need leadership that can reconcile temporal differences and balance the short-term pressures of elections with the longer-term imperatives of sustainability.

## 25) Deepening of India-Bangladesh Ties

### Context

- The deepening of ties between Bangladesh and India comes at a time of increased uncertainty in South Asia.
- Sri Lanka and Pakistan are reeling from economic and political crises. The region as a whole is dealing with the twin shocks of the pandemic and the supply chain problems caused by the conflict in Ukraine.

### Trade Front

- Both sides have directed officials to begin negotiations on the **Comprehensive Economic Partnership Agreement (CEPA)** which is long overdue:
  - **India is Bangladesh's second biggest trade partner and its largest export market in Asia.**
  - Despite the pandemic, **bilateral trade grew at an unprecedented rate of almost 44 per cent** from \$10.78 billion in 2020-21 to \$18.13 billion in 2021-22.

### Border management and River Waters

- On both border management and river waters — two issues on which there have historically been differences between Delhi and Dhaka — significant progress has been made.
  - An MoU has been signed between the Ministry of Jal Shakti and the Bangladesh Ministry of Water Resources on the **withdrawal of water from the Kushiyara.**
  - The two sides also affirmed that **border management is a shared priority** and commended the fact that the deaths on the border have greatly reduced. Both countries have agreed to expedite work to complete all pending developmental works within 150 yards of the Zero Line, including fencing starting with the Tripura sector with the objective of maintaining a tranquil and crime-free border.

### Concerns

- For all the progress, however, there is still much to be done.
- The long-pending issue of **sharing Teesta waters**, a major concern for Dhaka, continues to be unresolved, in no small part due to the stance of the Government of West Bengal.
- Dhaka has traditionally **relied on Beijing for its defence needs.**
- The strategic cooperation between Delhi-Dhaka needs to keep pace with economic ties.

### Conclusion

- Bangladesh has done much to deal with terrorism and extremism, and to deny a haven to anti-India groups.
- The PM of Bangladesh described the India-Bangladesh relationship

as **“a role model for neighbourhood diplomacy worldwide”**. Such a relationship needs to be carefully nurtured.

## Model Questions

- 1) The Intergovernmental Panel on Climate Change reports that there is a continuous increase in the global temperature for the coming years. Assess the impact of increase in temperature in India and suggest some measures to reduce the impact of heat in India.
- 2) Women form around 50 percent of the total population of India. Yet their role in participatory democracy is at a staggering level of around 20 percent. Critically analyse the reason behind it and suggest some measures to overcome the same.
- 3) "The abundance of nitrogen and declining availability of nitrogen affects the biodiversity differently". Discuss in the light of the above statement.
- 4) The forest communities protect and help in the conservation of forests through Community Forest Resource Rights. Substantiate it with the help of NC Saxena committee recommendations on it.
- 5) Female labour force participation is at a meagre of around 24%. Analyse the programmes under DAY -NRLM (Deendayal Antyodaya Yojana - National Rural Livelihood Mission) that can help in boosting the same.
- 6) India aims to achieve a \$5 trillion economy by 2025. Boosting rural income will help the target to be intact. Analyse the governmental measures in boosting rural income.
- 7) Gandhiji said that India lives in Villages. Analyse how rural industrialisation will impact the lives of people in villages. Enumerate the governmental schemes that help in increasing rural industries.
- 8) India is facing a trade deficit in the balance of trade in goods. Rural exports can help in overcoming it. Discuss the governmental measure for boosting the rural exports.
- 9) Tribal uprisings form a major part of British resistance from 1757 to 1947. Discuss tribal uprisings in central India before and after 1857.
- 10) Patriarchy remains as a hurdle to women in obtaining inheritance rights. Land Ownership gives women moral support and financial support. Critically analyse the above statement.
- 11) From importer of defence products to exporter of defence products India has come a long way. Discuss the governmental measures in achieving this milestone.
- 12) Are Freebies a tool of empowerment or a tool of electoral politics? Comment.
- 13) Illegal extraction of Minor Minerals leads to irreparable losses to the Environment and revenue loss to the exchequer. Analyze suitable measures to overcome these challenges.
- 14) Can Tribal Health Mission alleviate the health problems faced by tribal people? Comment

- 15) India can lead developed countries in the Animal Pandemic Preparedness Model template. Critically analyse the above statement.
- 16) India needs to step up its R&D funding to achieve a higher standard of living for every citizen. Comment.
- 17) How can India and the EU leverage each other's advantage and thereby contribute to a multipolar world? Critically analyse.
- 18) Universal Basic Insurance is a better alternative to Universal Basic Income. Critically Analyse.
- 19) Explain the role of 5G in the context of Law enforcement agencies and authorities. Substantiate with suitable examples.
- 20) What do you understand by the term 'Green Premium'? Do you think adopting green technologies to achieve net zero emission impede India's development? Comment.
- 21) The root cause of malnourishment is not so much the inadequacy of food but its skewed consumption. Critically examine.
- 22) Discuss the evolution of water management policy in India. What steps can India take to ensure water security?
- 23) The Indian government's \$10-billion incentive plan to boost semiconductor manufacturing is well timed. Comment. What are the advantages and challenges the Indian semiconductor industry faces?
- 24) Discuss measures that India can take to achieve the objective of Energy Atma - Nirbharta.
- 25) India-Bangladesh relationship is described as a role model for neighborhood diplomacy worldwide but such a relationship needs to be carefully nurtured. Comment.