



CURRENT AFFAIRS PROGRAM

PRE-CUM-MAINS 2024

JULY 2023 - BOOKLET-3

TABLE OF CONTENTS

1. General Studies Paper – 3	2
1) Economy: Textile Sector	2
A) Prelims: PM Mitra (PM Mega Integrated Textile Region and Apparel).....	4
B) Prelims: Textile PLI Scheme.....	4
C) Prelims: SAMARTH (Scheme for Capacity Building in Textile Sector)	4
2) Economy: Internationalization of RUpee	5
3) Economy: Agriculture: Tomato Prices	8
A) Prelims: Cucumber Mosaic Virus (CMV) and Tomato Mosaic Virus (ToMV) (July 2023)	10
4) Infrastructure: Renewable ENergy: Distributed Renewable ENergy	11
5) Environment: Plastic Pollution.....	12
A) Some Recent Domestic Efforts towards reducing Plastic Waste and ensuring better plastic waste management ...	14
B) International Efforts.....	16
C) Key Challenges faced by Plastic Waste Management in India	17
D) Way Forward for India	17
6) Environment: Plastic Pollution – Need of a Global Treaty	18
7) Environment: Ground Water Issues	19
2. Prelims Facts	23
1) Culture: Pashmina Shawls	23
2) Geography: Places in News – Kerch Bridge (Crimean Bridge)	23
3) S&T: Nuclear Science and Technology: Personality – Oppenheimer	24
4) Biodiversity: Changthangi Goat	24
5) Biodiversity: Snakes: World SNAke Day.....	25
A) World Snake Day: 16th July.....	25
B) Snakes of India:	25
C) King Cobra (Ophiophagus hannah)	27
D) Reticulated Python.....	28
E) Indian Rat Snake (Ptyas mucosa)/ Oriental Rat Snake / Indian Rat Snake	29
F) Indian Rock Python	29
G) Other vulnerable snakes of India	30

1. GENERAL STUDIES PAPER – 3

1) ECONOMY: TEXTILE SECTOR

- **Why in news?**
 - » 43 new partners empaneled under SAMARTH; additional training target of 75,000 beneficiaries (July 2023: Source - PIB)
 - » PM MITRA mega textile parks will bolster productivity, foster innovation and generate many employment opportunities: PM (July 2023: Source PIB)
- **Practice Question:**
 - » What role does the textile sector play in the economic development of India? What are the major challenges faced by the industry in the current scenario. [15 marks, 250 words]
- **Introduction:**
 - » The Textile Sector, also known as the textile and apparel industry, is a crucial part of global economy. It involves the production, processing, and distribution of various types of fabrics, fibers, and clothing.
- **Role of Textile Sector in India's Economic Development:**
 1. **Employment:** Textile sector directly engages around 5 crores of the population and is the 2nd largest employer after Agriculture.
 - It also has huge employment potential as it is a labor intensive sector.
 2. **Industrial Output:** It contributes to around 10% of India's industrial production and adds to value addition.
 3. **Export Earning:** It is one of the largest contributors to India's exports. In 2022-23, India's textile and apparel exports were worth more than \$40 billion.
 4. **Inclusive Growth:**
 - Textile mills provide a lot of opportunities weaker section and under privileged.
 - Apparel sector provides opportunities for women who constitute
 - Requires less training period (3-4 months) and thus is suitable for even unskilled workforce.
- **The sector has a lot of potential to grow:**
 - » Rising cost of manufacturing in western countries (USA, Europe)
 - » Structural shift in Global industry
 - China who was an undisputed leader for the 1980-2010 period have lost momentum after the 2009 economic crisis.
 - It is vacating the global export markets due to high wages and shift in focus to the domestic market.
 - India stands a good chance to capture a mammoth share of space ceded by China in global textile and apparel trade leveraging its raw material and manpower advantages
 - » Abundance of skilled and cheap manpower
 - » Vast natural resources and favorable economic policies
 - Easy raw material available of natural as well as manmade fibers

- » Large domestic demand - increase in disposable income of consumers and their increasing propensity to spend on clothing items has been driving a double digit growth of the domestic market.
- **Key Challenges of textile sector:**
 - » **Financial Stress due to overcapacity:** As per the Confederation of Indian Textile Industry (CITI), there is a 30% over-capacity in spinning and weaving sector. PM-MITRA parks may add further capacity in few years.
 - » **Moderating Exports** (compared to FY2021-22) due to Inflation, Russia Ukraine war etc.
 - » **Cotton Import Duty**
 - » **Supply disruptions** due to COVID-19 and war.
 - » **FDI inflow** in textile sector are yet to recover to pre-pandemic levels.
 - » **Lack of Innovation:** Indian textile industry has been slow to innovate. This has prevented the sector from penetrating certain markets.
 - » **Lack of focus on man-made fibers** whose demand has increased globally.
 - » **Pollution:** Textile and apparel effluents account for 17-20% of all water pollution.
- **Steps taken by government to promote textile sector:**
 1. **PM MITRA** announced in Budget 2022-23 is aimed at creating seven PM MITRA Parks which will increase investments, production and competitiveness of India's textile sector. It will also lead to improved quality of the products and reduced logistics cost. All this will also contribute to employment generation in India.
 2. **Production Linked Incentives (PLIs)** related to textile sectors have been launched to promote investment and increase the production of Man-Made Fibre (MMF) Apparel, MMF Fabrics and Products of Technical Textiles.
 3. **Scheme for Capacity Building in Textiles Sector (SAMARTH)** is a demand driven and placement-oriented umbrella skilling program of Ministry of Textiles. It aims to incentivize and supplement the efforts of the industry in creating jobs in the organized textile and related sectors.
 4. **Labor Reforms** like introduction of fixed term employment to ensure that the sector is able to easily hire workers during the peak season.
- **Way Forward:**
 - » **Digitalization and Automation** in areas such as design, prototyping, and production are the key to the future. It will improve the production quality and timely delivery.
 - » **PM MITRA and National Logistic Policy 2022**, if implemented properly can be crucial in reducing the logistic cost.
 - » **Focus on Sustainability:** Regenerative organic farming (that focuses on soil health, animal welfare, and social fairness), sustainable manufacturing energy, and circularity should be adopted.
 - » **Adaptability in meeting the demands** of man-made textiles, other complex products and services are also important.
 - » **Reskilling and upskilling** of the labor force should be a priority for the region to stay aloft in the market.
 - » Finally, there is a need of government's proactive support in infrastructure, capital, liquidity and incentivization.

A) PRELIMS: PM MITRA (PM MEGA INTEGRATED TEXTILE REGION AND APPAREL)

- **Why in news?**
 - » PM Modi lauded the foundation stone laying of 2 PM-MITRA mega textile parks in Maharashtra and Gujarat over the last few years (July 2023)
- **Details of the Scheme:**
 - » Announced in the Budget 2023
 - » **Ministry of Textiles**
 - » Government has approved setting up of seven PM MITRA Parks.
 - » The parks will not only reduce logistics costs and improve competitiveness of Indian textiles but also boost employment generation, attract domestic investment and FDI, and position India firmly in the global textile market.
 - » Government expects the parks to attract investments worth Rs 70,000 crores, generate jobs for 20 lakh people, and can create integral value chain for the products.
- The Centre has selected sites in TN, Telangana, Karnataka, Maharashtra, Gujarat, MP and UP to set up new textile parks.
- As of July 2023, foundation stone for 2 PM-MITRA mega textile parks have been laid. These parks will be in Amravati, Maharashtra and Navsari, Gujarat.
 - » These parks are expected to create one lakh direct and two lakh indirect employment.

B) PRELIMS: TEXTILE PLI SCHEME

- Approved outlay of Rs 10,683 crores (over five years starting from Jan 2022) to promote investment and increase the production of Man-Made Fibre (MMF) Apparel, MMF Fabrics and Products of Technical Textile.
- This will enable the textile sector to achieve size and scale, enhancing export competitiveness.

C) PRELIMS: SAMARTH (SCHEME FOR CAPACITY BUILDING IN TEXTILE SECTOR)

- **Why in news?**
 - » In a meeting of the Empowered Committee for Scheme for Capacity building in Textile Sector (SAMARTH), the panel of implementing partners has been broadened with empanelment of 43 new implementing partners and additional target of training around 75,000 beneficiaries. (July 2023: Source - PIB)
- **Details about SAMARTH:**
 - » It is a flagship skill development initiative of Ministry of Textiles. Launched in 2017, it aims to provide demand-driven, placement-oriented skilling programs to incentivize and supplement the efforts of the industry in creating jobs in the organized textile and related sectors.
 - » It was formulated under the broad skilling policy framework adopted by M/o Skill Development & Entrepreneurship (MSDE).
 - » It has provisions for skilling in Apparel & Garmenting segments both at the entry level as well as upskilling/reskilling of existing workers.
 - » It also caters to the upskilling/reskilling requirement of traditional sectors such as handloom, handicraft, silk and Jute.
- **Progress:**

- » As of July 2023, the Ministry of Textiles has partnered with 157 Industries/Industry associations, 16 central/state government agencies and 3 sectoral organizations of the Ministry undertaking the training program SAMARTH.
- » Out of the skilling target of 4.72 lakh beneficiaries allocated so far, 1.88 lakh beneficiaries have been provided training.
- » More than 85% of the beneficiaries trained so far under the schemes are women. More than 70% of the beneficiaries trained in organized sector course have been provided placement.

2) ECONOMY: INTERNATIONALIZATION OF RUPEE

- **Why in news?**
 - An RBI appointed working group recommended various measures to accelerate internationalization of the rupee (July 2023)
- **Example Questions:**
 - Discuss the major challenges and obstacles faced by the Indian Rupee in achieving internationalization and becoming a global reserve currency. [15 marks, 250 words]
 - Discuss the key advantages and disadvantages of having the Indian Rupee as an International currency for cross-border transactions [10 marks, 150 words]
- **What is Internationalization of Rupee?**
 - Internationalization is a process that involves increasing the use of the rupee in cross-border transactions. It involves promoting the rupee for import and export trades, and then other current account transactions, followed by its use in capital account transactions.
 - It will also require:
 - » **Full capital account convertibility** (currently India allows only full current account convertibility, capital account convertibility is limited).
 - » **Availability in sufficient quantities**
 - » **Opening up of currency settlement and a strong swap and forex market**.
- **Advantages of Internationalization of Rupee:**
 - **Reduces exchange rate risks**, while curtailing the demand for US dollar.
 - This not only promotes ease of doing business but also improves the chances for Indian businesses to grow globally.
 - **Reduces the need of forex war chest** to meet the external vulnerabilities.
 - **Reduces risk to economy** due to sudden withdrawal of capital from market.
 - **Lower cost of capital** due to better access to international financial markets.
 - **Bargaining power of Indian businesses** will increase, adding weight to Indian economy and enhancing India's global stature and respect.
 - **Reduced transaction costs**: They will not have to incur exchange rate fees.
 - **Geopolitical Significance**: US-dollar dominated global currency system can become limitations for the economy if India's relations with US and Europe becomes tense in future. In that scenario, business in domestic currency can be a savior.

- Internationalization of currency is closely linked with a nation's economic progress.
 - Currently, the US \$, the Euro, the Japanese Yen and the pound sterling are the leading reserve currencies in the world. China's efforts to make its currency renminbi (yuan) a reserve currency has met with only limited successes so far.
 - US\$ is said to enjoy an 'exorbitant privilege', which refers to the innumerable benefits that accrue to the US on account of all other countries of the world using the US\$ as their currency in most of their international transactions, among global currencies.
 - Factors behind US\$ being the most common currency of reserve and exchange:
 - **Size of US Economy** (largest in the world)
 - **Reach of its trade and financial market**
 - **Depth and liquidity** of the US financial market
 - History of macro-economic stability
 - Currency convertibility
 - Lack of viable alternative.
 - Is there are challenger to US dominance?
 - The obvious challenger to US dominance is the Chinese Renminbi. However, its ability to rival the US dollar will depend on future policies in both the US and China and the ability of Chinese economy and its financial system to demonstrate long term resilience, integrity, transparency, openness and stability.
- China's Experience:
 - Before 2004, RMB couldn't be used outside China.
 - By 2007, the "Dim Sum bond" and offshore RMDB bond market had been created.
 - Post 2008, China pursued a phased approach.
 - First, it allowed use of RMB outside China for Current account transactions and for select investment transactions (FDI, outward direct investment) etc.
 - By 2009, it had signed currency swap agreements (i.e., an exchange of an equivalent amount of money, but in different currencies) with countries like Brazil, UK etc.
 - Then, Central banks, offshore clearing banks and offshore participating banks were allowed to invest excess RMB in debt securities.
 - Singapore Free Trade Zone was launched in 2013, to allow free trading between non-resident onshore and offshore accounts.
 - In this way, overtime RMB was internationalized, with reserve currency status increasingly enabled. For e.g. in Q2, 2022, the RMB's share of international reserves had reached around 2.88%.
- Steps Taken towards Internationalization of Rupee:
 - **Liberalization of Capital Account**: Over the years, government has relaxed FII and FDI norms, facilitating greater cross-border investment and trade.
 - Enabling of ECB in rupee.
 - Currency Swap Agreements with several countries, which allow for the exchange of rupee and foreign currency between the central banks of the two countries.
 - RBI allowed banks from 18 countries to open Special Vostro Rupee Accounts (SVRAs) for settling payments in Indian Rupees.

- RBI constituted Inter-departmental group (IDG) headed by RBI Executive Director **Radha Shyam Rathi** to frame roadmap for the Internationalization of Indian Rupee has submitted its report.
 - During PM Modi's visit to UAE in July 2023, Reserve Bank of India (RBI) signed two MoUs with Central Bank of UAE. One of the MoU focuses on establishing a framework to promote the use of local currencies from cross-border transactions, the other was for linking payment systems.
- **Challenges in achieving internationalization:**
- » **Little traction for international trade in rupee:**
 - The daily average share of Rupee in the global foreign exchange market hovers around 1.6%, while India's share of global goods trade is around 2%.
 - For e.g. Russia reportedly preferred Yuan or Dirham as a medium of transaction for Indian imports of oil, rather than rupee.
 - » **Large Trade Deficit:** It would make acceptance of Rupee in global economy would be limited due to its depreciation problem.
 - » **Lack of Liquidity:** For now, Indian rupee is not as liquid as other major global currencies and thus it may be difficult to buy and sell large amounts of rupees.
 - » **Underdeveloped Financial Markets:** India's financial market are still relatively under-developed when compared to major economies, which can limit the range of products and services available to international investors.
 - » **IDG has also highlighted following limitations that may arise due to internationalization of Rupee:**
 - Exchange rate volatility in rupee's exchange rate will increase in initial stages of internationalization
 - Triffin Dilemma: Obligation of a country to supply its currency to meet the global demand may come in conflict with its domestic monetary policies.
 - Accentuation of external shock may take place due to open channel of flow of funds into and out of the country and from one currency to another.
 - » However, the IDG itself said that the advantages of internationalization far outweigh the above limitations. Moreover, the internationalization of rupee will be a long drawn process and would enable timely redressal of these challenges.
- **Recommendations given by RBI's Inter-Departmental Group:**
- » **Short term measures:**
 - Adoption of Standardized approach for examining the proposals on bilateral and multilateral trade arrangements for invoicing, settlement, and payment in the rupee and local currencies.
 - Encouraging the opening of the rupee accounts for non-residents both in India, and outside India.
 - Incentivizing exporters to use Indian currency for trade settlements.
 - Integrating payment systems to provide seamless cross border transactions.
 - Strengthening the financial markets by fostering a global 24X5 rupee market
 - Recalibration of FPI regime.
 - » **Medium Term Measures (2-5 years targets)**
 - Synchronizing tax regimes of India and other financial centres.
 - A review of taxes on masala bonds
 - Allowing banking services in the rupee outside the country

- Allowing international use of RTGS for cross border trade
 - Inclusion of Indian government bonds in global bond indices
- » **Long Term**
 - Measures to have rupee included in the IMF's SDR.
- **Other steps that can be taken:**
 - » **Focus on increasing exports** - As India increases exports and accepts money in rupee, it will lead to more acceptance of rupee internationally.
 - » **Rupee should be made fully convertible** - letting financial investments move freely between India and abroad.
 - » **Deeper and more liquid rupee bond market** - This will allow foreign investors and Indian trade partners to have more investment options in rupees, enabling its international use.
 - » **Additional Currency Swap Agreements** (as with SL) would further allow India to settle trade and investment transactions in rupees, without resorting to a reserve currency like dollar.
 - » **Tax incentives to foreign businesses** to utilize rupees in operations in India would also help.
 - » **Currency Management Stability:** RBI and Finance Ministry has to ensure currency management stability through consistent and predictable issuance/retrieval of notes and coins.
 - » **Improvement in general macro-economic parameters** - The Tarapore Committee's recommendations must be pursued including a push to reduce fiscal deficits lower than 3.5%, a reduction in gross inflation rate to 3%-5% and a reduction in gross banking NPAs to less than 5%.
- **Conclusion:**
 - » As the Indian economy grows in size, as its trade linkages with other countries grow stronger, more space will be created for using the rupee in international transactions.

3) ECONOMY: AGRICULTURE: TOMATO PRICES

- **Why in news?**
 - » Prices of tomatoes hovered between Rs 100 to Rs 200 in various parts of the country (July 2023)
- **Example Question:**
 - » Discuss the key factors responsible for annual increase in prices of Tomato in India. How can sustainable production and technological interventions be leveraged to enhance tomato production while addressing the concerns of both farmers and consumers? [15 marks, 250 words]
- **Introduction**
 - » Among the vegetables consumed in India, Tomato ranks 3 after potato and Onion, but globally it is the 2nd most consumed vegetable after Potato.
 - Note: Botanically, tomatoes fit the definition of fruit as they form from a flower and contain seeds.
 - » In terms of area under tomato cultivation and in terms of total production, India ranks 2nd in the world.
 - The major tomato producing countries in the world are China, India, USA, Turkey and Egypt.

- **About Tomato production in India**

- » **India's total tomato production** is around 20 million tonnes. It peaked in 2019-20 at 21.187 million tonnes and has been **declining since**. The production in 2021-22 dropped to 20.69 MT and 20.62 MT in 2022-23.
- » It is typically a 90-100 day crop that starts yielding fruits 60-70 days after transplantation.
 1. The seeds are first sown in nursery beds to raise seedlings that are transplanted in fields after around 25 days.
 2. Production happen in flushes.
- » There are two major crops of tomato annually - **Kharif and Rabi**.
- » There are two main crops of tomato grown in the country.
 1. The first one transplanted from around mid-June in Central and South India (places such as Shivpuri, Sagar in **MP**, Nasik In **MHA**, Madanapalle in **AP**, Kolar and Mysore in **Karnataka** and Dindigul in **TN**) and mid-July to Aug in North India (Jhalawar and Jaipur-chomu belt in Rajasthan; Sonabhadra, Varanasi, Lucknow, Bareilly and Agra in Uttar Pradesh) and stretching to end of Sep in Eastern India (Purulia in West Bengal, Buxar in Bihar and Ranchi in Jharkhand)
 - **The autumn to late kharif crop supplies the market from Sep onwards**. This along with a smaller rabi crop transplanted during October-November, contributes to the familiar low tomato prices through the winter.
 2. The second main crop is transplanted during January-February. This is a longer duration crop typically taking 130-150 days, yielding an average of 25 tonnes per acres.
 - This is the **summer tomato** as it is harvested during May-July is grown mostly in regions where maximum temperature don't go beyond the mid-to-late thirties range during the flowering and fruiting season.
 - Such conditions are mostly found in relatively cool or hilly areas such as Madanapalle, Mysore, Kolar in Karnataka; Sangamner and Narayangaon in Maharashtra, or Solan and Mandi in Himachal Pradesh.

- **Why increase in Prices:**

- » **Dip in overall tomato production due to:**
 - i. **Lower acreage of tomato**
 - ii. **Extreme Weather Conditions**
 - i. **Heatwaves and High temperatures** in April and May along with delayed Monsoon showers in southern India and Maharashtra led to attack on tomato crops.
 - **Farmers in Maharashtra have said their tomato crop was impacted by attacks of the Cucumber Mosaic Virus (CMV) and growers in Karnataka ad other South Indian States have blamed the Tomato Mosaic virus (ToMV) for crop loss.**
 - ii. Later, incessant rains in tomato-growing regions further affected the new crop and also made transportation to non-growing regions difficult.

- iii. **Low commercial realization of the crop for farmers** in the months of June as well as the last year.
 - iv. **Seasonal Fluctuation:** July and August are the lean tomato production.
- **Other general challenges:**
 - » **Perishability of tomato** is much higher than Onion and Potato.
 - » **Supply chain issues** in transporting the vegetable from areas where it is grown to regions where it is not compounds the problem.
- **Way Forward** for dealing with Price Fluctuations in Tomato:
 - » **Improved Supply Chain** - to deal with wastage due to perishability
 - Analyze why initiatives like TOP scheme and Operation Greens has failed and what lessons can be learned from the scheme.
 - Government should identify pre-existing clusters and invest in infrastructure in these areas. This infrastructure could include cold storages at the block or village levels, supported by solar dryers and cottage level processing plants.
 - Similarly, improvement of connectivity in hilly areas such as Himachal Pradesh, Uttarakhand, Kashmir, and parts of north-east will be very crucial. These reasons facilitate major off-season production.
 - » **Special MSP for TOP Crops** - supported by government led production - This will ensure stability in acreage.
 - » **Improved food processing** - Linking tomato value chain to processing of at least 10% of tomato production into tomato paste and puree during peak seasons, and using them in lean season (July-Aug), when tomato prices are high.
 - » **Reforming Marketing:**
 - **Eliminating middleman** and **encouraging FPOs** to sell produce directly
 - **Amending APMC laws** to reduce cartelization, commission and other fees.
 - » **Increasing Yield:**
 - Tomato yield in India at 25 tonnes per hectare (25t/ha) is very low than the global average of 37t/ha.
 - ICRIER suggests encouraging cultivation in structures called poly houses and greenhouses (as done in many European countries), which can control pest attacks.
 - » **Accurate weather forecasts** should be made accessible to farmers. If there are sufficient advanced predictions of heavy rain or floods, farmers can prematurely harvest and save at least a part of their crop that can come into the market.
 - » **Satellite mapping of sowing area and dissemination of this data for better supply side planning**
 - Both over-production and under-production creates multiple wastages and should be avoided.

A) PRELIMS: CUCUMBER MOSAIC VIRUS (CMV) AND TOMATO MOSAIC VIRUS (TOMV) (JULY 2023)

- Farmers in Maharashtra have said their tomato crop was impacted by attacks of the Cucumber Mosaic Virus (CMV) and growers in Karnataka ad other South Indian States have blamed the Tomato Mosaic virus (ToMV) for crop loss.
- The two plan pathogens have similar names and cause similar damage to crops, but they belong to different viral families, and spread differently.

- **About Tomato Mosaic Virus (ToMV):**
 - » It belongs to the **Virgaviridae** family and is closely related to the **Tobacco Mosaic Virus (TMV)**.
 - » **Hosts:** ToMV hosts include tomato, tobacco, peppers, and certain ornamental plants.
 - » **Spreading mechanism:** It mainly spreads through infected seeds, saplings, agricultural tools and often, through the hands of nursery workers who have failed to sanitize themselves before entering the field. It would require only few infected saplings for virus to take over an entire field in matter of days.
 - » In the present case, farmers have blamed seed manufacturers and nurseries.

- **About Cucumber Mosaic Virus (CMV)**
 - » It was first identified in cucumber in 1934, which gave the virus its name.
 - » **Hosts:** It has much larger host pool that include cucumber, melon, eggplant, tomato, carrot, lettuce, celery, cucurbits (member of gourd family, including squash, pumpkin, zucchini, some gourds, etc.) and some ornamentals.
 - » **Spreading mechanism:** They spread by aphids, which are sap-sucking insects. CMV too can spread through human touch, but the chances of that are extremely low.

- **Impact of these viruses:**
 - » Both viruses can cause almost 100% crop loss unless properly treated on time.
 - The foliage of **plants infected by ToMV** shows alternating yellowish and dark green areas, which often appears as blisters on the leaves. Distortion of leaves and twisting of younger leaves are also symptoms. The fruit develops **necrotic spots**, which leads to **overripening**. Younger plants are dwarfed, and fruit setting is affected.
 - CMV too cause distortion of leaves, but the pattern is different. Often **leaves at the top and bottom are distorted** while those in the middle remain blemish free. Overall it causes stunting and lower production.

- **Controlling these viruses:**
 - » Following biosafety standards in nurseries, and compulsory seed treatment to stop spread of ToMV.
 - » **Awareness among farmers:** Farmers who buy trays of saplings should check before planting, and discard any visible infected material. They should also look for signs of infection during cropping cycle and remove any infected plants without allowing it to touch the healthy ones.
 - » Any eye must be kept on aphid migration so that measures can be taken while planting the crop.

4) INFRASTRUCTURE: RENEWABLE ENERGY: DISTRIBUTED RENEWABLE ENERGY

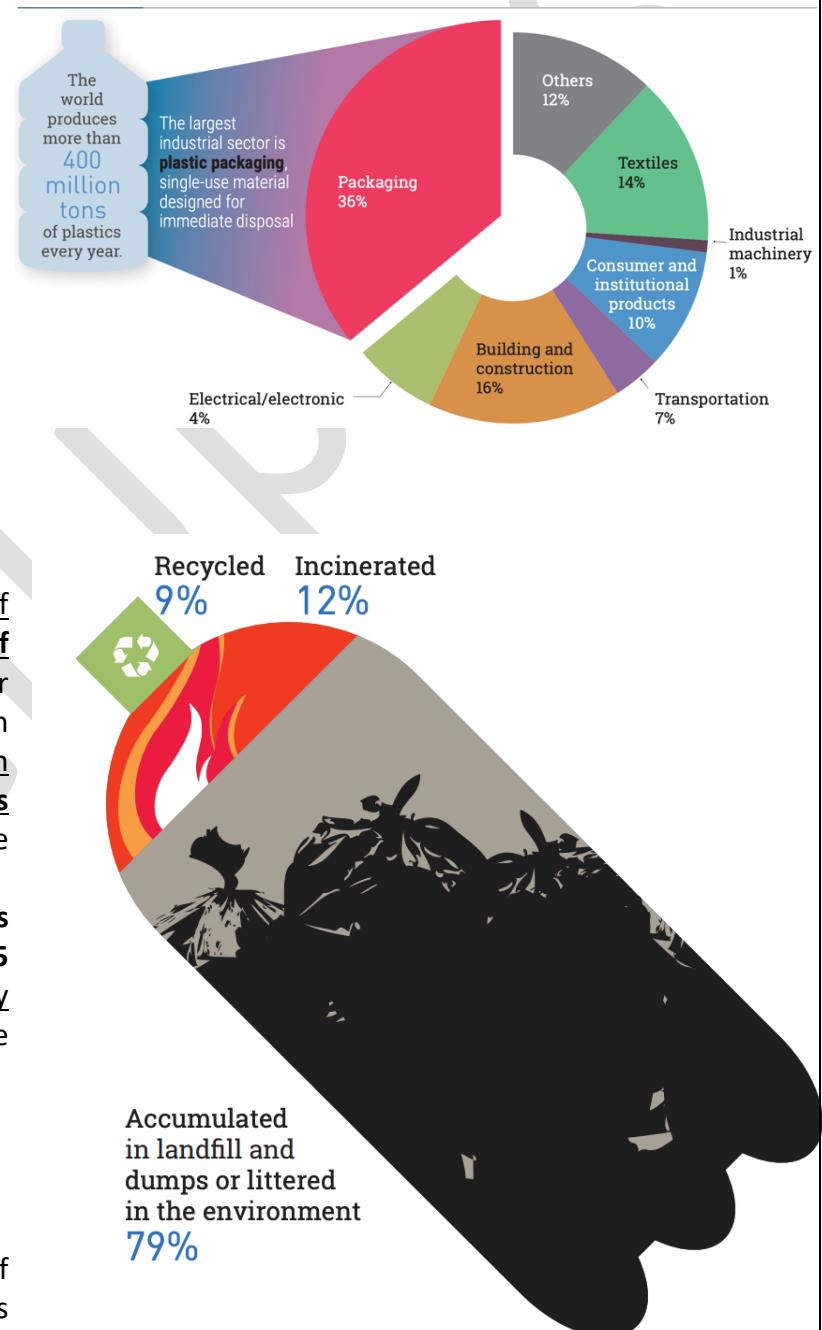
- **Why in news?**
 - Distributed Renewable Energy (DRE) can help achieve SDG 7 - access to affordable & sustainable energy for all: G20 Energy Transitions Working Group Side Event (July 2023, Source: PIB)
 - Decentralized clean energy tech can impact 37 million livelihoods in India's agri sector, textile sector: Study (May 2023, Source: DTE)

- **Example Question:**

- "Decentralized renewable energy play a vital role in transitioning towards a more sustainable and resilient energy future, particularly in areas where centralized grid infrastructure is inadequate or non-existent" Critically Analyze [10 marks, 150 words]
- **Decentralized Renewable energy** refers to generation and distribution of renewable energy at a small and localized level, typically closer to the point of consumption.
 - Currently, India has 12 mature technologies powered by DRE. These include high capacity irrigation pumps, as well as micro-pumps, silk reeling machines, dryers, charkhas, small horticulture processors, small refrigerators/deep freezers, cold storages, vertical fodder growing institutions units, grain milling machines etc.
 - The DRE technologies include solar run textile manufacturing units, biomass powered cold solar storages and micro solar pumps etc.
- **Key characteristics** include localized generation, distributed energy resource, Off-Grid or Mini-Grid Solutions;
- **Advantages:**
 - **Environmentally sustainable:** DRE doesn't lead to environmental damages which are caused by large scale hydropower plants, large scale solar parks etc.
 - **Energy Security:** Technologies like rooftop solar, micro hydel power plants etc. can lead to sustainable energy production and thus can ensure long term energy security.
 - **Inclusive Growth:** DRE can ensure energy supply and thus other associated services in remote, under-developed regions.
 - **Scalability and Flexibility:** DRE can be scaled gradually depending on the local needs.
 - **Job Creations:** DRE will stimulate local job opportunities in manufacturing sector, installation, operations etc.
 - As per MNRE, DRE has a market potential of Rs 4 lakh in rural and peri-urban communities in India.
- **Challenges and way forward**
 - **Repairing** remained a challenge: Enough human resource and contact with manufacturers is still poor, especially in remote areas.
 - Skill development can not only improve the repair services but can also provide increased job opportunities.
 - **Affordability** - For a lot of people, affordability is a major concern and increased access to loans/government incentives is crucial for accessing the DREs.
 - At the same time, development of DRE industries in India, more R&D, etc. would be important for reducing the cost of the technology.
- **Conclusion:**
 - DRE can play a vital role in transitioning towards a more sustainable and resilient energy future, particularly in areas where centralized grid infrastructure is inadequate or non-existent.

5) ENVIRONMENT: PLASTIC POLLUTION

- **Practice Questions:**
 - What is Extended Producer Responsibility (EPR) in plastic waste management. Why has EPR provisions have not been effective so far in dealing with plastic pollutions in the country. Suggest some measures to improve its implementation. [15 marks, 250 words]
- **Introduction**
 - Plastic is a lightweight, hygienic and resistant material which can be molded in wide range of applications and is cheaply manufactured. Because of these reasons, since the 1950s, the production of plastic has outpaced almost all other materials.
- **Extent of Plastic Pollution:**
 - Globally, plastic production stands at about 400 million tonnes, and could double by 2040.
 - **Global Plastic Production by Industrial Sector, 2015**
- **How is plastic disposed off?**
 - According to the UNEP, as of 2015, of the 9 billion tonnes of Plastic that the world has ever produced, only 9% has been recycled and 12% has been incinerated, the balance 79% has accumulated in landfills or in the natural environment.
- India produces around **10 million tonnes of plastic** per year of which around 5 million tonnes is rendered waste every year. Therefore, its crucial that this waste is properly managed.
- **Harmful Impacts of Plastic Pollution**
 - **Physical Pollution:** Pieces of plastics interact with living bodies and ecosystems. It causes physical harm through ingestion, choking and entanglement hazards to wildlife on land and in ocean.



- For e.g. UAE in the UAE an estimated 1% mortality rate of dromedary camels is attributable to plastic pollution.
- Similarly, microplastics can be ingested by organisms at the bottom of food chain like oceanic planktons. This may reduce photosynthesis and growth.
- **Chemical Pollution:** A number of chemicals used in plastic are toxic and carcinogenic and are responsible for infertility, recurrent miscarriage, feminization of male foetuses etc.
- **Environmental Impacts:**
 - **Plastisphere:** Sometimes called the 'Plastisphere', bacteria, viruses and other life colonize the surface of plastic waste, creating distinct communities and population structure.
 - They may also contribute in growth of invasive species. For e.g., more than 80% of invasive species in the Mediterranean may have arrived on floating plastic waste.
- **Health and Social Impact:** Health losses, welfare losses -> unusable parks, Sewage Blocking -> Malaria, Dengue etc.
 - As per a study published by World Wildlife Foundation (WWF) in 2019, an average human may be ingesting as much as 5 grams of plastic every week. This is because 1/3rd of the plastic waste that is getting generated ends up in nature, especially water, which is largest source of plastic ingestion.
 - **Welfare loss** associated with visual disamenity of a park being contaminated with litter.
 - **Blocking of sewage** due to plastics also contribute to vector borne diseases like Malaria and Dengue.
- **Economic Impact**
 - Visual pollution negatively impacts the tourism sector.
 - Further, future cost of removing these plastics from nature is higher than the cost of preventing the littering today.
- **Exacerbate disasters like floods** - an important cause of urban floods.
- **Even the biodegradable plastics** have many unintended consequences.
- **Exacerbates Climate Change:** Plastics are 80% carbon and more than 99% of plastics use crude oil, fossil gas or coal as feedstock. Manufacturing also involves burning of large quantities of fossil fuels to provide high energy demands of the industrial processes.
 - By 2015, the total estimated lifecycle emissions from plastics were **1.78 billion tonnes** of CO₂ equivalent (GtCO₂e). For context, if the whole plastics lifecycle were a country, it would be fifth largest emitter of greenhouse gases in the world.

A) SOME RECENT DOMESTIC EFFORTS TOWARDS REDUCING PLASTIC WASTE AND ENSURING BETTER PLASTIC WASTE MANAGEMENT

a. Plastic Waste Management Rules 2016 (as amended in 2021)

- **Min thickness** of plastic carry bags has been increased to 120 microns from 31st Dec 2022 (after the 2021 amendment to the rules)
- **Ban on Several Single Use Plastic:** The manufacture, import, stocking, distribution, sale and use of several single use plastics (e.g ear buds with plastic sticks, plastic sticks for balloons, plastic plates, cups, glasses etc.) including polystyrene and expanded

polystyrene commodities shall be prohibited wef from 1st July 2022. (as per the 2021 amendment)

- **Plastic Packaging Waste**, which is not covered under the phase out of identified single use plastic items, shall be collected and managed in an environmentally sustainable way through the **EPR** of producer, importer and Brand Owner (PIBO), as per the Plastic Waste Management Rules, 2016.

1. For effective implementation of EPR, the Guidelines for EPR being brought out have been given legal force through the Plastic Waste Management Rules, 2021.

- **Expand the coverage to rural areas.** The earlier regulations only covered urban municipal areas.
- **Introduces Extended Producer Responsibility** for producers and generators of Plastic Waste
- **Shopkeepers and Vendors** can only use plastic carry bags which have been properly labelled and marked for use or else there will be imposition of fines.
- **ULB and Panchayats** have been provided with the responsibility of establishing and operating waste management systems.

b. **Guidelines on EPR for Plastic Packaging** under 'Plastic Waste Management Rules, 2016: Notified in Feb 2022

- **Mandatory Registration** on the centralized portal developed by CPCB of entities such as producer, importer, brand owners and waste processors of plastic.
- The guidelines categorizes SUPs in 4 categories and provides targets for minimum level of recycling.
- **Environmental Compensation** shall be levied based upon polluter pay principle, with respect to non-fulfilment of EPR targets.
- **Sale and Purchase of surplus EPR certificates are allowed** -> this has thus set up market mechanisms for plastic waste management.
- **Focus on Digitization:** Implementation of EPR will be done through a customized online platform which would act as the digital backbone of the system. It will allow tracking and monitoring of EPR obligations and will reduce the compliance burden for companies through online registration and filing of annual returns.
- Further, to ensure monitoring on fulfilment of EPR obligations, the guidelines have prescribed a system of verification and audit of enterprises.
- Producers, importers, & brand owners, may operate schemes such as deposit refund system or buy back or any other model.
- CPCB shall constitute a committee under chairpersonship of Chairman, CPCB that shall be responsible for recommending measures to MoEF&CC for the effective implementation of EPR that shall include amendments to the EPR guidelines.
- **Promote development of new alternatives** to plastics
- **Significance:**
 - Gives boost to formalization and further development of plastic waste management sector.

- By operationalizing EPR, the amendment implements the '**Polluter Pay Principle**'. It aims to hold manufacturers and producers of ecologically unsustainable plastic items financially and socially accountable for the pollution these materials cause.
 - Online Monitoring mechanism -> Increase accountability
 - Market based approach -> Promotes Ease of Doing Business.
 - The amendment demonstrates India's political will to address the challenge of plastic pollution.
 - Promote Development of Alternatives
 - **Concerns/Challenges**
 - The biggest challenge will be to implement highly ambitious recycling and reuse targets in a country where various existing waste management rules haven't been implemented.
- c. **Strengthening of waste management infrastructure** through Swatch Bharat Mission.
- d. **Promotion of Alternatives:**
- CPCB has already provided certificates to more than 300 manufacturers of **compostable plastics**.
 - India Plastic Challenge - Hackathon conducted for development of innovative alternatives to SUP.
- e. **Steps for Effective Monitoring** (E.g., an SUP Public Grievance App, an SUP compliance Monitoring Portal etc.)
- g. **Stricter Punishment:**
- Those found violating the SUP ban would be penalized under the Environment Protection Act, 1986 - which allows for imprisonment upto 5 years, or a penalty upto Rs 1 lakh or both.
- h. **Awareness Generation:**
- **Mascot 'Prakriti'** has been launched to spread awareness about how small lifestyle changes can play a big role in environmental sustainability.
- i. **Promoting Alternative uses of Plastic Waste:**
- For e.g.
 - waste plastic is being used as replacement of coking coal (by upto 1%) in steel manufacturing.
 - MoRT&H have also issued guidelines for use of plastic waste in road construction.
- j. **WWF-India and CII** have joined hands to develop a platform to promote a circular system for plastics. The new platform is called, the '**India Plastic Pact**'.

B) INTERNATIONAL EFFORTS

- a. **Steps towards Plastic Pollution Treaty:** In 2022, the UN member states agreed to start negotiating new global treaty to end plastic pollution. Now it is crucial that the treaty that is finalized is ambitious and effective enough to truly address the plastic crisis.
 - As of July 2023, 2 negotiation meetings, for the new treaty has taken place.
- b. **Awareness and Education:**
 - The theme of **World Environment Day, 2018** was "**Beat Plastic Pollution**" and it focused on increasing awareness related to plastic pollution across the world.

- c. EU Parliament bans 10 single use Plastics with effect from 3rd July 2021
- d. Other International Initiatives which deal with Plastic Waste
 - i. #Clean Seas campaign of UN Environment
 - To reduce and eliminate the use of single use plastic, cosmetics and micro-plastic sources
 - ii. Stockholm Convention on POPs
 - It is an international environment treaty that came into force in 2004 and aims to restrict or eliminate the production of PoPs.
 - iii. Honolulu Strategy by UNEP aimed at reduce **marine debris**

C) KEY CHALLENGES FACED BY PLASTIC WASTE MANAGEMENT IN INDIA

- Problems like lack of people's participation, source segregation, absence of a suitable alternatives etc are increasing the load on plastic management sector.
- **Domination of Informal sector:** Around 70% of the plastic waste management industry is informal in nature and yet no major effort towards formalizing the industry has been pushed in recent times.
- **Plastic Waste management** has been put under a **5% GST bracket** hurting the formal sector, which already lacks a concrete action plan.
- **Implementation of Plastic waste management rules** have been poor in all aspects.
 - In the past too, many states in India have banned plastic at state level. However, these bans have a very little impact on ground.
 - A CAG Report in Dec 2022 highlighted that MoEF&CC has no mechanism to assess the collection and safe disposal of plastic waste. This has led to poor implementation of the 2016 rules as well as the EPR guidelines.
- Since waste management is the responsibility of the local bodies, the resource constraints with our local bodies in terms of **human resource and infrastructure** is another major challenge.
- **COVID-19 pandemic** has increased the plastic pollution burden drastically - masks, gloves, sanitizer bottles, PPE kits etc.

D) WAY FORWARD FOR INDIA

- **Improving the Waste Management System**

IMPROVE WASTE MANAGEMENT SYSTEMS	Segregation of waste at sources: plastics, organic, metals, paper, etc.	Effective collection of the segregated waste, transport and safe storage	Cost-effective recycling of materials (including plastics)	Less landfilling and dumping in the environment
---	---	--	--	---
- **Promoting Circular Economy:** As per a recent report by UNEP titled - "*Turning Off the Tap: How the world can end plastic pollution and create a circular economy*" - Global Plastic Pollution can reduce by 80% by 2040 if countries and companies make deep policy and market shifts using existing technologies and shift to circular economy.
- **Reducing the Usage of Plastic**
 - **Focus on Packaging Innovation -> Promote Eco-friendly alternatives:** This will reduce the use of plastic for packaging purpose which has expanded in recent years, especially due to e-commerce.
 - Companies need to invest more in R&D to find sustainable alternatives.

- **Taxing Plastic Production** can also increase the cost of plastic and thus help in reducing the usage
 - **Awareness generation** among end users.
- Steps to **implement EPR** -> innovative solutions such as offset mechanism and deposit refund schemes
 - The producers/generators may also form **waste cooperatives** and employ informal waste pickers if offset mechanism is in place.
- **Strengthening Local Bodies** -> **More resources with local bodies** can be ensured by support from producers. This resource can contribute in more sustainable waste management system by ensuring better infrastructure.
- **Social Awareness and Public Pressure**
- **International collaboration and coordination** -> A Global pact like Montreal Protocol and Paris Agreement for the reduction of plastic production and usage.

- **Conclusion**

With a worldwide crisis due to plastic waste, India has to find a way to curb its plastic pollution at the earliest and that is only possible when all the stakeholders take the responsibility of ensuring minimization, reuse and recycling of plastic to the maximum.

6) ENVIRONMENT: PLASTIC POLLUTION – NEED OF A GLOBAL TREATY

- **Why in news?**
 - 2nd Session of Intergovernmental negotiation Committee (INC) on plastic pollution was held in Paris in June 2023.
- **Background:** In 2022, the UN member states agreed to start negotiating new global treaty to end plastic pollution. Now it is crucial that the treaty that is finalized is ambitious and effective enough to truly address the plastic crisis.
 - The Intergovernmental Negotiation Committee (INC) on Plastic Pollution is in the process of developing "an international legally binding instrument on plastic pollution, including in the marine environment"
 - As of July 2023, 2 negotiation meetings, for the new treaty has taken place.
- **Why is a global Treaty on Plastic Pollution required?**
 - i. **Plastic Pollution is a global problem** which requires global solution. Most of the plastic is being dumped into oceans. This is eventually converting into micro-plastics, entering food chain and affecting everyone.
 - ii. Plastic pollution is harmful to wildlife and biodiversity which is impacting everyone.
 - iii. **Increased International Cooperation** will be feasible through a global treaty.
 - iv. The treaty may set global target for reduction
 - v. A global treaty may make the fight against plastic pollution more fair -> by giving higher responsibility to developed economies and giving more time to under developed countries.
- **Way Forward:**

- **Fast Track the Negotiation** to finalize the treaty quickly (unlike the agreements under UNFCCC which took many years of negotiations).
 - The treaty should have plans to reduce production and consumption of plastics and chemicals used in plastics, especially by businesses.
 - It should have provisions to regulate priority sectors like packaging which use unsustainable amounts of plastics.
 - Along with reduction, transparency with respect to production, consumption and import/export of plastic and plastic waste has to be created and nurtured at a global level.
- **Conclusion:** A strong global plastic treaty would be a major step forward in the fight against plastic pollution. It will not only help environment, but will also be crucial for human health and our future.

7) ENVIRONMENT: GROUND WATER ISSUES

- **Why in news?**
 - India's farmers need financial motivation to check indiscriminate use of groundwater for irrigation (July 2023: Source - DTE)
 - Increased rainfall alone will not help groundwater recovery (June 2023: Source - TH)
 - A study by IIT Delhi shows that - climate change led excessive rainfall will not be able to compensate for depletion of ground water. The periods of high precipitation may not directly translate to an overall increase in groundwater storage.
 - The increasing influence of evapotranspiration will become dominant in the far period and at higher warming levels.
- **Example Questions:**
 - What are the major factors contributing to the depletion of groundwater resources in India? Suggest sustainable measures to address this issue [15 marks, 250 words]
- **Introduction: Global Situation**
 - As per World Water Development Report, 2022, Ground water accounts for 99% of the liquid freshwater on earth. It has continued to serve humankind for many millennia and currently around 50% of water used in domestic purpose and 25% of water used for irrigation globally comes from groundwater.
 - Yet, despite its enormous importance, this natural resource is often poorly understood, and consequently undervalued, mismanaged and even abused.
- **India's Situation:**

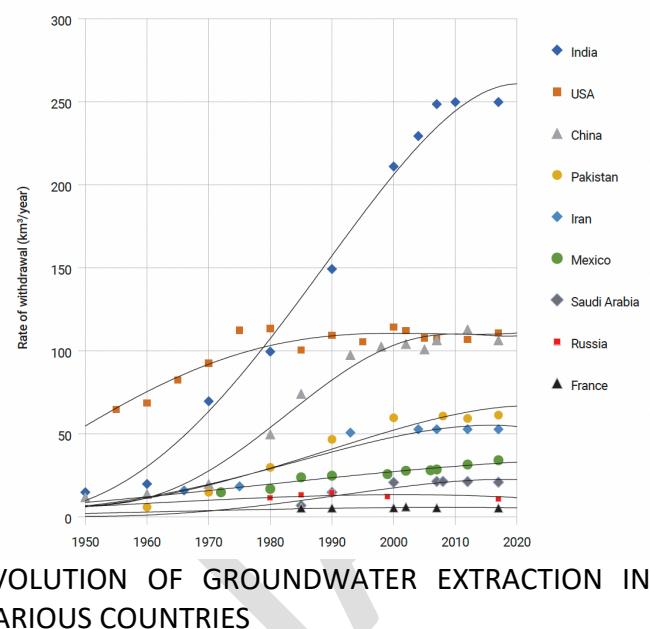
Annual extractable groundwater availability in India (2017) is 393 BCM.

India is the largest user of ground water in the world, extracting **253 BCM** per year, which is 25% of the global ground water extraction. It extracts more groundwater than USA and China combined together. Most of the ground water extracted in India is for Irrigation (228 Billion Cubic Meter (BCM)) which accounts for 90% of the total extraction.

- In India, 60% of irrigation requirement is fulfilled by groundwater.

The remaining **10%** (225 BCM) is for drinking, domestic as well as industrial uses.

Industrial use accounts for only 5% of the total extraction



- **Satellite Gravimetry** has provided convincing evidence in support of the alarming rates of groundwater depletion.
- The data is supported by local level water table measurements in wells, where in 61% decline has been seen by CGWB.
- As per the 2022 assessment by the CGWB, 14% of assessments units in the country (1006/7089) have been categorized as 'Over-exploited' where the annual groundwater extraction is more than annual available Ground Water Resource. 4 States/Uts viz. Haryana, Punjab, Rajasthan, Dadra & Nagar Haveli and Daman & Diu have stage of Ground Water Extraction greater than 100%.

Key Challenges:

- **Depletion due to Over-extraction:**
 - Over the years, groundwater has become the dominant source of irrigation as well as for domestic purpose. This is primarily due to unavailability of surface irrigation in regions such as Rajasthan.
 - Installation of tube-wells have increased in north-western plains. Since the 1980s, 77% of the total addition to irrigation has come from tubewells. This has allowed farmers in the region to grow water intensive crops like Wheat and Rice. It has also allowed increase in cropping intensity by allowing for sowing of crops during dry winters.
 - **Electricity Subsidy for agriculture and increased rural electrification** has also been a factor behind over-exploitation of ground water.
 - **Expansion of solar powered irrigation systems** which have led to very affordable cost of ground water extraction.
 - **Weak law and regulations** to prevent or limit diffuse groundwater pollution.
 - Industry that withdraws groundwater include manufacturing, mining, oil, and gas, power generation, engineering, and construction.
 - Bottled water industry is emerging as a major extractor.

- **Destruction of wetlands, aquifers etc.** which used to act as water sinks and contributed to ground water recharge.
- **Pollution:** Many sources of groundwater pollution are located in or near surface, but several other sources inject pollutants into the subsurface at greater depth below the surface.
 - Pollution due to Agriculture is widespread and difficult to control as it is a diffused source and includes large quantities of nitrates, pesticides, and other agronomics.
 - Industrial effluent discharge; Leaching through coal ash waste dumps; Fracking of natural gas, particularly in shallow aquifers can present considerable risk of groundwater contamination.
- **Irreversibility:** Once polluted, the aquifers tend to remain with polluted water.
- **Climate Change:** CC impacts groundwater through impacting precipitation, leakage from surface water, sea water intrusion into coastal aquifers
- **Key Efforts for Groundwater:**
 - **Recent Schemes:**
 - **Jal Shakti Abhiyan:** First launched in the year 2019, it focuses primarily upon effectively harvesting the monsoon rainfall through creation of artificial recharge structures, watershed management, intensive afforestation, awareness generation etc. JSA for the year 2023 was launched on 4th March 2023 with the theme "Source Sustainability for Drinking Water".
 - **Amrit Sarovar Mission** - launched in April 2022 - focuses on developing and rejuvenating 75 water bodies in each district of the country as part of celebration of Azadi ka Amrit Mahotsava.
 - **Atal Bhujal Yojana** is being implemented by central government in collaboration with states. It has an outlay of Rs 6,000 crores and is being implemented in certain water stressed areas of Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh. The Primary aim of the scheme is demand side management through scientific means based on water budgeting of the area involving local communities at village levels leading to sustainable groundwater management in targeted areas.
 - **Institutions:**
 - **Central Ground Water Authority (CGWA)** has been constituted under Section 3(3) of the "Environment (Protection) Act, 1986" for the purpose of regulating and control of ground water by industries, mining projects, infrastructure, projects etc. in the country.
 - The latest guidelines in this regard with Pan- India applicability was notified by Minsitry in 2020. CGWA and State issues No Objection Certificate (NOC) for extraction of groundwater to various industries/project proponents as per their jurisdiction and as per the extant guidelines.

- CGWA is also implementing **National Acquifer Mapping Program (NAQUIM)** in the country. These reports along with management plans are shared with States/Uts for suitable intervention.
 - MoHUA has formulated **Model Building By Laws (MBBL)**, 2016 for the states/ Uts, wherein adequate focus has been given on requirement of rainwater harvesting and water conservation measures. 35 states/Uts have adopted the features of the Model Bye Laws.
 - Major and Medium projects under Accelerated Irrigation Benefit Program are also reducing dependency on ground water extraction.
- **Way Forward:**
- **Controlling over-extraction:**
 - i. **Rationalizing Energy Pricing** - to make it expensive to withdraw groundwater
 - ii. **Reforming MSP regime** - to encourage the production of oilseeds, pulses etc. instead of water guzzling crops.
 - iii. **Incentive Driven - Volumetric Water Pricing** - This will motivate the economy in water-use.
 - Direct and visible incentives are required for the economy in terms of water use and diversifying the cropping pattern in the state.
 - iv. **Improving Water Use Efficiency in Agri-Sector:** Micro-irrigation, less water intensive crops.
 - v. **Development of high yielding varieties** of crops such as pulses, millets etc. The increased productivity can play a crucial role in encouraging farmers to move away from water guzzlers.
 - vi. Enforcing Groundwater regulations - To ensure groundwater is used in a sustainable manner.
 - **Recharging Groundwater:**
 - **Protecting and rehabilitating wetlands; Watershed Management** (small and large check dams)
 - For e.g. the state of Maharashtra have started there own Managed Aquifer Recharge Program such as the Jalyukt Shivar.
 - **Rainwater Harvesting** in urban areas could be crucial in reducing the extraction of groundwater.
 - Effectively implementing Building Laws - to make it mandatory for large houses to provide water harvesting facilities.
 - **Pollution Control:**
 - Reducing the Open Dumping of Municipal Solid Waste, controlling surface water pollution and strict action against water polluting industries.
- **Conclusion:** Through these efforts, India can help to address the issue of groundwater depletion and ensure that this vital resource is available for future generations.

2. PRELIMS FACTS

1) CULTURE: PASHMINA SHAWLS

- **Why in news?**
 - A first of its kind initiative is helping women artisans recreate authentic Pashmina shawls that are making comeback in the valley (July 2023)
- **About Pashmina Shawl**
 - A Pashmina Shawl (also known as Kashmiri Shawl) is a luxurious shawl made from Pashmina; a type of fine wool obtained from Pashmina Goats (Changthangi Kashmeri goat).
 - They are known for their softness, warmth, and elegant appearance.
 - A shawl costs anywhere between Rs 25,000 to Rs 2,00,000 depending on the intricate work and yard used. The raw pashmina is procured from high-altitude regions of Ladakh and engages artisans from Kargil and Leh.
- **Details about efforts to bring back artisans/women artisans in Pashmina sector:**
 - **Background:** Power looms and poor wages drove 10,000 women artisans away from the job of spinning in the state.
 - **Wajahat Kazi**, a writer-turned-entrepreneur came up with a novel idea to stem the attrition. He set up the first Karkhana in the valley (website: [website zaevyul.com](http://zaevyul.com)) encouraging women to travel to work and paid them monthly wages, besides a cut from the profits. Through this he has been able to revive and retain centuries-old ways and means of shawl production, without introducing machine at any stage.

2) GEOGRAPHY: PLACES IN NEWS – KERCH BRIDGE (CRIMEAN BRIDGE)

Kerch Bridge (Crimean Bridge) : It is a 19 km bridge which links Russian mainland with Ukrainian Peninsula in the black sea. The bridge has two parallel rail and roadways. It was opened in 2018 by Russian President Vladimir Putin with great fanfare, four years after Russia annexed Crimea from Ukraine after a contested referendum.

In July 2023, According to Russian authorities, one of the sections of the bridge was blown up killing two people and injuring a child. Russians have claimed that this was an attack by Ukraine.

The **bridge is so important for Russians** for symbolic, administrative and operational reasons.

- **Connectivity:** Before Russia had control over Donbas and Kherson, the bridge was the only connection between mainland Russia and Crimea.
- Even now, when it has control over the Donbas and Kherson, it is not far from the frontline and well within the range of Ukrainian fire. So, the **Kerch bridge remains a**



critical logistical supply link for the Russian troops in the south.

3) S&T: NUCLEAR SCIENCE AND TECHNOLOGY: PERSONALITY – OPPENHEIMER

- **Why in news?**
 - » Christopher Nolan's new film on the American Physicist who built most destructive weapon known to man was released on 21st July 2023.
- **J Robert Oppenheimer** (1904-1967) was an American physicist and one of the most prominent scientists of 20th century. He is best known for his role as the scientific director of the Manhattan Project, the top-secret US government program during WW-II that led to the development of the first atomic bomb.
- **Education:** He was born in 1904, in New York City. He attended Harvard University and studied Physics there. He completed his PhD in theoretical physics at University of Gottingen in Germany under the supervision of Max Born in 1927. Later he returned to USA, and taught in University of California, Berkely, and the California Institute of Technology (Caltech). He made significant contribution to physics, especially in the area of quantum mechanics and quantum field theory, earning him the recognition as one of the leading theoretical physicists of his time.
- In **1942**, he was appointed as the scientific director of the Manhattan Project. He played a crucial role in organizing and coordinating the efforts of various scientists and engineers to develop an atomic bomb. The project resulted in successful detonation of the first atomic bomb on 16th July 1945, in the New Mexico desert, in an area known as the Trinity Test Site.
- **The use of Atomic Bomb** over Hiroshima and Nagasaki in Aug 1945 led to the end of WW-II and raised profound ethical and moral questions about the use of nuclear weapons. Oppenheimer was deeply affected by the destruction caused by the bombs and became an advocate for arms control and international cooperation in the peaceful use of atomic energy.
- **His political views** and opposition to nuclear weapons led to him coming under scrutiny during the era of McCarthyism and the Red Scare. In 1954, his security clearances were removed and he was also ostracized from the scientific community.
- Inspite of these controversies, he continued serving at Princeton from 1947 – 1966. In 1963, he received the Enrico Fermi Award, one of the highest honors in the field of nuclear science.
- He passed away in 1967, leaving behind a complex legacy of a brilliant physicist and a controversial figure in American History.
- It was only in 2022, that the US government nullified its 1954 decisions, and affirmed his loyalty. President Joe Biden's Energy Secretary, Jennifer M Granholm, said the decision to revoke Oppenheimer's clearance was the result of a “flawed process”, and that with time more evidence of his loyalty and love of country have only been further affirmed.

4) BIODIVERSITY: CHANGTHANGI GOAT

Changthangi or Pashmina Goat is a special breed of goat indigenous to the high altitude regions of Ladakh. They are raised for ultra-fine Kashmere wool, known as Pashmina once woven. The textile is home spun and were first woven in Kashmir.

These goats are generally domesticated and reared by nomadic communities called the Changpa in the Changthang region of Great Ladakh. They live in tough and hostile terrain of **Changthang** and are solely dependent on Pashmina for livelihood. At present there are around 2,400 families rearing around 2.5 lakh goats.

Ladakh produces around 50 MT of the finest grade Pashmina in the world (12-15 microns).

IUCN: LC

In 2019, PASHMINA products have received BIS Certifications.

- BIS has published an Indian standard for identification, marking and labelling of Pashmina products to certify its purity

Significance of BIS Certification

- It will discourage counterfeit or substandard products presently mislabeled and sold as genuine Pashmina in the market.
- It will also ensure better prices for the goat herding community in Ladakh as well as Local handloom artisans producing genuine Pashmina products. They are till now disadvantaged due to rampant marketing malpractices.



5) BIODIVERSITY: SNAKES: WORLD SNAKE DAY

A) WORLD SNAKE DAY: 16TH JULY

- **History:**
 - World Snake Day is an annual event celebrated on July 16th to raise awareness about the importance of snakes and to dispel some of the myths and fears that surround them.
 - It was first celebrated in 2006 by the Snakebite Survivors Network (SSN) and the International Society of Herpetologists (ISH).
- **National Zoological Park, New Delhi** has celebrated World Snake Day on 16th July 2023.

B) SNAKES OF INDIA:

- Snakes have been slithering on earth for more than a 100 years. These creatures have evolved from lizards

- Globally, more than 34,00 species of snakes have been identified. India, is home to 350 species of snakes. Thus number is increasing constantly as a result of new discoveries. But only 15% of these are venomous.

THE BIG FOUR:

- The four venomous snake species responsible for causing the greatest number of medically significant human snake bite cases on Indian subcontinent are sometimes collectively referred to as the **Big Four**.
- They Include the following snakes:

Russel's Viper: Daboia russelii:

It is native to Indian subcontinent. They are mainly nocturnal.

Their hiss is amongst the loudest hiss of the snakes in the country.

IUCN Status: LC

They are responsible for more than **40% of snake bites in India**.



Common Krait (Bungarus caeruleus):

It is a nocturnal snake and thus most of the human encounters happen at night.

IUCN: Not Evaluated

They are responsible for around **18% of snake bites in India**.



Indian Cobra (Naja Naja):

Indian Cobra is a species of the genus Naja found in India, Pakistan, Bangladesh, Sri Lanka, Nepal and Bhutan. It is also known as the spectacled Cobra, Asian Cobra, or binocellate Cobra.

Conservation Status:

It is not a threatened species and is not listed in IUCN Red List.

It is listed under Appendix II of CITES because it closely resembles other species that are threatened and in need of protection.

About Genome Sequencing

A large international team of researchers affiliated with corporate and academic institutions has sequenced the genome of the Indian Cobra. They have published their paper in the journal Nature Genetics. The group describes their goal to develop an anti-venom.

With gene sequencing scientists are hoping that it would be lead to development of an antivenom based on synthetic recombinant venom built from protein.



Indian Saw Scaled Viper (Echis Carinatus):

It is a venomous viper species found in West Asia, Central Asia and South Asia.

It is the smallest member of the big four snake that are responsible for causing the most snakebite cases and deaths, due to various factors including their frequent occurrence in highly populated region, and their inconspicuous nature.

IUCN: Note Evaluated



C) KING COBRA (OPHIOPHAGUS HANNAH)

Details about King Cobra: It is one of the most venomous snakes in the world. They can reach upto 18 feet in length, making them longest of all venomous snakes.

Habitation and Distribution

- King Cobra lives mainly in the **rain forests and plains in India, southern China and Southeast Asia**. They are comfortable in a variety of habitats, including forests, bamboo thickets, mangrove swamps, high altitude grasslands, and in rivers.
- In India, they are known from Odisha and Jharkhand. Recently (Aug 2022), it has been confirmed that their habitat has expanded to Central India (Chhattisgarh) as well.

Food:

- They are carnivores and it other snakes, lizards, eggs, and small mammals.

Other special features

- They are the only snakes in the world that build nests for their eggs, which they guard ferociously until the hatchlings emerge.
 - It is best known as the species of choice for the snake charmers of South Asia. Though, they can hear, they are actually deaf to ambient noises, sensing ground vibrations instead.
 - **Snake charming** is “often a sad con game in which an exhausted cobra is put on the defensive, yet conditioned (with pain) not to strike the flutist,” Smithsonian’s National Zoo says



Protection Status: They face a variety of threats stemming from human activities, these snakes are vulnerable to extinction.

- **IUCN Status: VU**
- **CITES: Appendix-II**
- **WPA: Schedule-II**

Note: It is different from **Indian Cobra (Naja naja)** which is not a threatened species.

Increase in sightings in Human Settlement in Odisha

- Disturbances caused by forest fires and other human activities may cause the king cobras to come to their natural habitats in the forests to human habitats.
- The dwindling population of prey in forests could be other reason.

Sightings of King Cobra in Chhattisgarh for the first time (Aug 2022)

- **31 nesting spots of King Cobras** have been confirmed in the Korba forest range.
- **Note:** Earlier, there was no known evidence of the longest venomous snake in Chhattisgarh or all of central India before this.
- King Cobras require a continuous forest patch. Their presence indicates that the habitat is performing better in terms of ecosystem services.

D) RETICULATED PYTHON

It is the longest snake (third heaviest) in the world regularly reaching 6.25 m in length. The longest reticulated python ever recorded was 10 metres.

It is a non-venomous snake.

IUCN: LC (wide distribution)

Distribution: Native to South and South-east Asia

Habitat: Rainforests, woodlands, grasslands.



E) INDIAN RAT SNAKE (PTYAS MUCOSA)/ ORIENTAL RAT SNAKE / INDIAN RAT SNAKE

It is a common non-venomous species of Columbidae family found in south and Southeast Asia. In northern India they are also called **Dhamans**.

They are famous for their crawling speed and large size. They are a farmer's friend, as they help control the rodent population from destroying crops.

They are favorite meals of King Cobra.

Ptyas mucosa



Indian rat snakes (grey and yellow)

Conservation status



F) INDIAN ROCK PYTHON

It is one of the heaviest and longest snakes found in India.

Despite being common in most part of the country it is difficult to see them in the wild as they are nocturnal and arboreal snakes. They have a thermal sensing pit on their jaws.



G) OTHER VULNERABLE SNAKES OF INDIA

Burmese Rock Python (*Python bivittatus*)

It is one of the five largest species of snakes in the world. It is found in SE Asia, Southern China and North-Eastern Indian region.

Note2: It is an invasive species in Southeastern United States and it reached there as a result of pet trade.



Useful Video: [The Bounty Hunters Catching Pythons In Florida \(HBO\)](#) (The bounty hunters Catching Pythons in Florida)

6) DFENCE EXERCISE: JIMEX 23

JIMEX (Japan India Bilateral Maritime Exercise)	India Japan	JIMEX 23, Naval Exercise 7th Edition: In Bay of Bengal, hosted by Indian Navy When: July 2023	The exercise was <u>first held in 2012</u> with special focus on <u>maritime security cooperation</u> . JIMEX 23 witnessed <u>complex exercises</u> , undertaken jointly by the two navies. Both sides engaged in advanced level exercises in all three domains of maritime warfare - surface, sub surface and air.
---	-------------	---	--