

## DAILY CURRENT AFFAIRS (DCA)

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## INDIA TO GET ABOVE-NORMAL MONSOON RAINFALL: IMD

### Context

- Recently, India Meteorological Department (IMD) has forecast 'above normal' rains in the country after a gap of eight years.

### About the Monsoon Forecast:

- The IMD has predicted that the country will receive **106% of the long-term average rainfall (LPA)** this season, with a **model error of approximately 5%**.
- The LPA for the period between June and September is 87 centimetres (870 mm), and is calculated as the average rainfall between 1971-2020.
  - By this calculation, it means that there would be 92.2 cm of rainfall across India.

### About IMD

- It is an agency of the **Ministry of Earth Sciences**.
- It is the principal agency responsible for meteorological observations, weather forecasting and seismology.
- It is also one of the **six Regional Specialised Meteorological Centres** of the **World Meteorological Organisation (WMO)**.
- It releases the long range forecast in two stages in April and June.

### IMD Categorisation Method of Monsoon:

- Long Period Average (LPA):** LPA of rainfall is the rainfall recorded over a particular region for a given interval (like month or season) averaged over a long period like 30 years, 50-years etc.
  - It acts as a benchmark while forecasting the quantitative rainfall for that region for a specific month or season.

### Categories of Rainfall

- Large Excess:  $\geq 60\%$  of LPA.
- Excess: 20% to 59% of LPA.
- Normal: -19% to +19% of LPA.
- Deficient: -59% to -20% of LPA.
- Large Deficient: -99% to -60% LPA.

### Predicting the Monsoon

- Monsoon season is from June to September in India as a whole, the long period average (LPA) is 88 cm and standard deviation is 9 cm (about 10% of mean value).

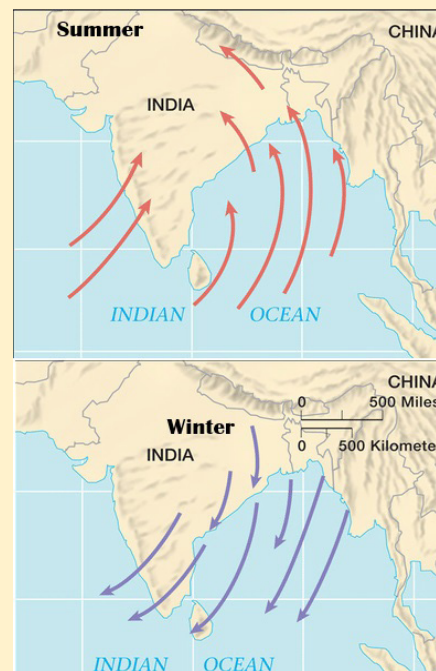
- Therefore, when the rainfall averaged over the country as a whole is within  $\pm 10\%$  from its LPA or 90% to 110% of LPA, the rainfall is said to be '**normal**' and when the rainfall is  $< 90\%$  of LPA it is considered to be '**below normal**' and when it is  $> 110\%$  of LPA, the rainfall is said to be '**above normal**'.

### Factors Influencing the Forecast

- Retreat of El Nino, and Favourable La Nina Conditions:** El Nino conditions, currently prevailing over the equatorial Pacific region and generally responsible for warmer temperatures in many places around the world including in India, were likely to weaken to neutral **El Nino Southern Oscillation (ENSO)** conditions during the early part of the monsoon season.
  - The warming phase of the ENSO cycle is known as El Nino and its cooling phase as La Nina.
- La Nina** conditions are likely to develop during the second half of monsoon season.
  - It is characterised by the unusual cooling of the central and east-central equatorial Pacific Ocean.
- Other key factors influencing the Indian monsoon are *Positive Indian Ocean Dipole (IOD)*, and *Reduced Snow Cover in the Northern Hemisphere*.

### Indian Monsoon

- The term 'monsoon' is derived from the **Arabic word 'mausim'**, which means season. Monsoons are characterised by a **seasonal reversal of wind direction**.



- The onset and retreat of the monsoon have profound implications for the country's climate, agriculture, and economy.

#### Monsoon Onset (Arrival):

- The winds blow from the **South-West** during the summer months (June to September).
- It typically arrives in the southern state of Kerala around the first week of June and gradually progresses northwards, covering the entire country by mid-July.
- The **IMD** officially declares the onset of the monsoon *based on specific criteria, including rainfall, wind field, and Outgoing Longwave Radiation (OLR) values.*

#### Monsoon Progress:

- After its onset over Kerala, the monsoon progresses northwards and covers the entire country in about a month and a half.
- The progress of the monsoon is closely monitored as it has significant implications for agriculture, particularly the **sowing of kharif (monsoon) crops.**

#### Monsoon Retreat (Withdrawal):

- It marks the transition from the rainy season to the dry winter season.
- The monsoon **begins to retreat from the northwestern states** of India around early September and withdraws completely from the country by early October.
- The retreat of the monsoon is not as abrupt as its onset.
  - It's a more gradual process, with the monsoon maintaining its presence over the southern and northeastern parts of the country well into October.

#### Impact on Agriculture and Economy

- The Indian summer monsoon plays a crucial role in India's agriculture and affects the livelihood of a fifth of the world's population.
- About 80% (*about 70% from south - west branch of monsoon*) of the annual precipitation over India occurs during the summer period, supplying water to crops during the prime agricultural season.
  - The southwest monsoon Agriculture accounts for about 14% of the country's GDP.

Source: TH

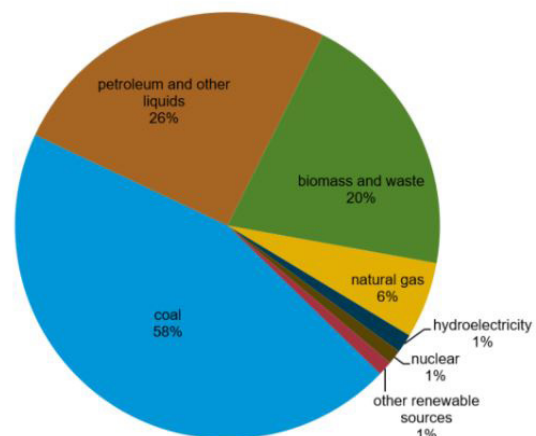
## GAS BASED POWER GENERATION IN INDIA

### Context

- The Centre has directed **all gas-based power generating stations** to operationalise their plants from May 1 to June 30 in view of **rise in electricity demand** due to an early onset of the heat wave this summer.

### India's Gas Based Energy Sector

- The **Central Electricity Authority** under the Ministry of Power, **monitors 62 gas based power stations**, with a total capacity of 23,845 MW using gas as primary fuel.
- India's natural gas demand** is expected to rise by **6 percent in 2024** with a rise in consumption in fertiliser units, power generation and industrial sectors, according to the International Energy Agency (IEA).
- India is the **4th largest importer of liquefied natural gas (LNG).**
- Significance:** Gas-based power plants offer several advantages, including **lower emissions and quicker ramp-up times compared to coal-based plants.**
  - However, the share of gas-based power generation in India's total power mix remains **relatively small compared to coal and renewable energy sources.**



### Need for the Gas Based Power Generation in India

- Cleaner Energy Source:** Gas-based power generation emits fewer pollutants compared to coal-based power plants, making it a cleaner option, especially in urban areas where air quality is a significant concern.

- **Flexibility and Efficiency:** Gas-based power plants are highly efficient and offer greater operational flexibility compared to coal-based plants.
- **Reduced Dependence on Coal:** India heavily relies on coal for electricity generation, but diversifying the energy mix with gas can reduce this dependence, enhancing energy security and reducing vulnerability to supply disruptions.
- **Rapid Deployment:** Gas-based power plants can be constructed relatively quickly compared to large-scale coal or nuclear plants.
  - ◆ This rapid deployment capability makes them a viable option for meeting short-term increases in electricity demand.

### Challenges Faced by the Sector

- **Import of Natural Gas:** India has **limited domestic natural gas reserves**, and the majority of its natural gas consumption is met through imports.
  - ◆ Despite efforts to explore and exploit domestic reserves, India still relies heavily on **imported natural gas, primarily from countries like Qatar, Australia, and the United States.**
- **Infrastructure Constraints:** The development of infrastructure, including pipelines, LNG terminals, and city gas distribution networks, is essential for the efficient transportation and distribution of natural gas.
  - ◆ However, the expansion of infrastructure in India has been hampered by factors such as **land acquisition issues, regulatory hurdles, and funding constraints.**
- **Competitive Pricing:** Natural gas competes with other energy sources such as coal, renewable energy, and imported liquefied petroleum gas (LPG) in India.
  - ◆ The pricing of natural gas relative to these competing fuels influence its attractiveness for various applications, including power generation, industrial use, and transportation.
- **Environmental Concerns:** While natural gas is considered a cleaner alternative to coal and oil, its **extraction, transportation, and combustion still produce greenhouse gas emissions.**
  - ◆ Addressing environmental concerns related to methane leakage, air pollution, and carbon emissions is crucial for the sustainable development of the gas-based energy sector.

### Government Initiatives to Increase Gas Based Energy

- **Infrastructure Development:** A total of 23,391 km of the natural gas pipeline is operational and about 4,125 km of the gas pipeline is under construction as of Feb 2024.
  - ◆ Target to increase the pipeline coverage by ~54% to 34,500 km by 2024-25 and to **connect all the states with the trunk natural gas pipeline network by 2027.**
- **Pradhan Mantri Urja Ganga (PMUG):** Launched in **2016**, PMUG aims to develop the **natural gas pipeline infrastructure in eastern India**, connecting gas sources and major demand centers.
  - ◆ The project involves the construction of a pipeline connecting **Uttar Pradesh to West Bengal, passing through Bihar, Jharkhand, and Odisha.**
- **City Gas Distribution (CGD) Network Expansion:** The government has been promoting the expansion of CGD networks across India to increase access to piped natural gas (PNG) for households, industries, and commercial establishments.
  - ◆ Under the CGD bidding rounds, licenses are awarded to entities for developing CGD networks in geographical areas identified by the Petroleum and Natural Gas Regulatory Board (PNGRB).
- **Natural Gas Marketing Reforms:** The government has introduced reforms in the marketing of natural gas to enhance transparency, promote competition, and attract investment in the sector.
- **Gas Price Rationalization:** Reforms such as the New Domestic Gas Pricing Guidelines (2014) and the introduction of the Hydrocarbon Exploration and Licensing Policy (HELP) have aimed to provide **pricing incentives for domestic gas producers while balancing the interests of consumers.**
- **Natural Gas Infrastructure Development Fund (NGIDF):** The government has set up the NGIDF to provide financial support for the development of natural gas infrastructure in India.
- **Promotion of LNG Imports and Terminals:** The government has encouraged investment in LNG import terminals to diversify gas supply sources and enhance energy security.

**Source: IE**

## TAMIL NADU'S DECENTRALISED INDUSTRIALISATION MODEL

### Context

- Tamil Nadu is India's No.1 state in terms of **economic complexity**, measured by the **diversity of its gross domestic product (GDP) and employment profile**.

### About

- About **45.3% of TN's** farm Gross Value Added (GVA) comes from the **livestock subsector**, the highest for any state and way above the 30.2% all-India average.
- TN is home to **India's largest private dairy company** (Hatsun Agro Product), broiler enterprise (Suguna Foods), egg processor (SKM Group) and also "egg capital" (Namakkal).

### Features of the TN's Industrialisation Model

- Development of Clusters:** TN's economic transformation has been brought about not by so-called Big Capital as much as **medium-scale businesses** with turnover range from **Rs 100 crore to Rs 5,000 crore**.
  - Its industrialisation has also been **more spread out and decentralised**, via the development of clusters. **Many cluster towns are hubs for multiple industries**.
- Employment Generation:** Most of these clusters have come up in **small urban/peri-urban centres**, providing employment to people from surrounding villages who may otherwise have migrated to big cities for work.
  - They have, moreover, created diversification options outside of agriculture, **reducing the proportion of TN's workforce dependent on farming**.
- Entrepreneurship:** TN's early industrialists were mainly Nattukottai Chettiars and Brahmins.
  - The disruptions from World War II and the Burmese nationalist movement led many to redirect their investments back home.
  - The remarkable thing about TN's entrepreneurial culture is its **percolation among diverse communities and in a range of industries**.
  - The drivers of TN's more recent decentralised industrialisation have been **entrepreneurs from more ordinary peasant stock and provincial mercantile castes**.

### Conclusion

- The entrepreneurship from below combined with its high social progress indices from public health and education investments explains **Tamil Nadu's relative success in achieving industrialisation and diversification beyond agriculture**.

Source: IE

## SPACE TOURISM

### Context

- Gopi Thotakura, an Indian entrepreneur and aviator, is set to make history as the first Indian space tourist and will join five other crew members on the NS-25 mission of Blue Origin.

### About Space Tourism

- Space tourism is essentially a section of the aviation sector which seeks to provide tourists with the opportunity to become astronauts and experience space travel for recreational, leisure, or business purposes.
  - If the mission is successful, **Thotakura would be the second Indian to go into space**.
    - The **first one** was Wing Commander **Rakesh Sharma**, who flew to the **Salyut 7 Space Station on a Soviet spacecraft in 1984**.

### Types

- Sub Orbital:** Sub-orbital spacecraft take passengers **just beyond the Kármán line** — nearly 100 kilometres from earth and considered to be the **boundary between Earth's atmosphere and outer space**.
  - The passengers get to spend a few minutes in outer space and then come back to Earth.
- Orbital:** Orbital tourism, on the other hand, entails remaining in space for at least one full orbit.
  - This is a major focus of governmental agencies and private space companies, all of which have the long-term goal to inhabit the moon and Mars.

### Rise of Space Tourism

- According to media reports, in 2023, the space tourism market was valued at \$848.28 million.
  - It is expected to grow to \$27,861.99 million by 2032.
- However, there are several challenges, such as high cost, and environmental concerns, that may limit the industry's growth.

### Major Players in Space Tourism

- There are now **six major space companies** that are arranging or planning to arrange touristic flights to space: *Virgin Galactic, Blue Origin, SpaceX, Boeing, Axiom Space, and Space Perspective*.
- While the first two (*Virgin Galactic, Blue Origin*) are focused on suborbital flights, Axiom and Boeing are working on orbital missions.
  - ♦ **SpaceX**, in its turn, is prioritising **lunar tourism** in the future.

### Challenges Associated with Space Tourism

- **High Costs:** Currently, space tourism is an expensive venture, accessible only to the wealthier sections of society.
  - ♦ A passenger generally has to pay at least a million dollars to reach outer space.
  - ♦ This high cost leads to social inequity and elitism, as it limits access to a privileged few.
- **Safety Concerns:** The weakening of bones and muscles due to lack of gravity (*atrophy*), potential damage to spacecraft from extreme temperatures and collisions with space debris, and health problems from extended space travel and radiation exposure are all risks associated with space tourism.
- **Environmental Impact:** Several studies have pointed out that space tourism may lead to environmental damage as rockets emit gaseous and solid chemicals directly into the upper atmosphere.
  - ♦ Scientists worry that growing numbers of rocket flights and the rise of space tourism could harm Earth's atmosphere and contribute to climate change.
- **Legal and Regulatory Challenges:** The regulatory framework for space activities is complex, with numerous international treaties and agreements governing space activities and national laws and regulations varying between countries.
  - ♦ There is an urgent need to draft new treaties to regulate the space tourism industry.
- **Infrastructure Limitations:** Limited infrastructure for space travel and tourism is another challenge that needs to be addressed.
  - ♦ As more companies invest in developing spacecraft and launch infrastructure, there

will be an increased demand for engineers, technicians, pilots, and other specialised professionals.

### Conclusion

- Space tourism represents a new frontier in human exploration. It not only offers the promise of space travel to ordinary people but also has the potential to drive technological innovation and inspire a new generation of explorers.
- The high cost of space travel and the potential environmental impact are significant hurdles that need to be addressed.
  - ♦ Moreover, the physical and psychological effects of space travel on humans are still not fully understood.
- As we stand on the cusp of this new era, it is clear that space tourism will play a significant role in shaping the future of human space exploration.

Source: IE

## NEWS IN SHORT

### ASHWAGANDHA

#### In Context

- India is the top producer and exporter of Ashwagandha with states like Rajasthan and Madhya Pradesh emerging as leading producers

#### About Ashwagandha

- Ashwagandha is also known as **Indian Ginseng or Withania somnifera or Winter Cherry**. It is among a group of herbs called 'adaptogens' and has a long history of use in Ayurveda.
- It is an evergreen herb mostly **found in India, Africa and the Middle East**.
- Ashwagandha has active substances called **withanolides and alkaloids**. Withanolides are organic compounds which are known to have medicinal properties. Alkaloids are also organic compounds (compounds of carbon), which are generally known for their soothing effect.

Source: BL

### RINGWOODITE

#### Context

- Researchers have discovered a gigantic reservoir of water 700 km beneath the planet's surface in a rock known as ringwoodite.

**About**

- The size of this subterranean ocean is triple the volume of all the planet's surface oceans combined.
- By analyzing the speed of the seismic waves generated by earthquakes, scientists inferred the composition of the Earth's inner layers.

**What is ringwoodite?**

- Ringwoodite is a mineral that exists in the Earth's transition zone. It has a unique crystal structure that allows it to absorb water and hydrogen, acting like a sponge.
- This mineral can hold a significant amount of water.

Source: TOI

**REQUIREMENTS FOR A PARLIAMENTARY CANDIDATE****Context**

- Recently domicile as a requirement for a parliamentary candidate was in news, as Union Minister for Women and Child Development Smriti Irani became an elector from her Lok Sabha constituency.

**Constitutional Provision**

- As per **Article 84** of the Constitution, both Lok Sabha and Rajya Sabha candidates must be citizens of India.
- While for the Lok Sabha, they need to be at least 25 years of age, the minimum age limit for the Upper House is 30.
- The Article also says that the candidates should possess "such other qualifications as may be prescribed in that behalf by or under any law made by Parliament".
- Article 84 also says that on being elected, the MPs must take an oath or affirmation as per the Third Schedule, which prescribes the format of the oath.

**Other Provisions**

- **The Representation of the People Act, 1951**, lays down that candidates for the Lok Sabha **should be enrolled as electors**, from any constituency.
  - ♦ The nomination papers that candidates fill out require them to attach the extract of the electoral roll where they are enrolled.

- However **Domicile is not a criterion for parliamentary candidates**, who are allowed to contest from multiple seats.

Source: IE

**SCIENCE BASED TARGETS INITIATIVE (SBTi)****Context**

- The SBTi recent declaration of allowing companies to utilize carbon offsets to fulfill their climate commitments has gathered widespread criticism

**About**

- **The Science Based Targets initiative (SBTi)** is a corporate climate action organization that enables companies and financial institutions worldwide to play their part in combating the climate crisis.
- SBTi perform various function such as;
  - ♦ **Defines and promotes best practice** in emissions reductions and net-zero targets in line with climate science.
  - ♦ **Develops standards, tools and guidance** to enable companies and financial institutions to set science-based targets in line with the latest climate science.
  - ♦ Through its validation services arm, it assesses and validates companies and financial institutions targets.

**What is a carbon offset?**

- A carbon offset refers to a way by which organizations or individuals can **cut down on their carbon dioxide emissions** from the atmosphere.
- These reductions are achieved through projects that either **capture and store carbon or prevent emissions** from occurring in the first place, such as through renewable energy projects, reforestation initiatives, and methane capture from landfills.
- Companies or individuals purchase carbon offsets to compensate for their own carbon emissions, thereby "offsetting" their environmental impact and contributing to climate change mitigation efforts.

Source: TOI

## SENSEX

### Context

- **The Indian stock market** extended **losses for the third straight session**.
  - ♦ **Escalating tension in the Middle East** due to the Israel-Iran conflict is one of the reasons for the stock market fall as the situation has resulted in geopolitical uncertainty in the region.

### About

- Sensex is the benchmark index of the **Bombay Stock Exchange (BSE) in India**.
- It was launched on **January 1, 1986** as a **basket of 30 stocks** representing the country's largest, financially-sound companies listed on the BSE.
- The term 'Sensex' is a blend of words '**Sensitive**' and '**Index**' and was coined by stock market expert **Deepak Mohoni**.
- If the Sensex value increases it means that there is a **general increase in the prices of shares**. On the other hand, if the value of Sensex declines, it means that there is a **general decrease in share prices**.
- Since sensex comprises companies from all key sectors of the economy, it truly **reflects the sentiment of the stock market in India**.

Source: IE

## CORALS

### Context

- **South Florida researchers** are using **biodegradable drinking straws** to prevent **laboratory-grown coral from becoming fish food**.

### About

- The **small biodegradable cage** that's made in part with drinking straws **boosts the survival rate of transplanted coral to over 90%**.
  - ♦ The coral cage consists of a **limestone disc** surrounded by eight vertical shade brand drinking straws.

### What are Corals?

- Corals are **invertebrates** that belong to a large group of animals called **Cnidaria**.
  - ♦ Corals are formed by **multiple small, soft organisms known as polyps**.

- ♦ They secrete a **rocky chalk-like (calcium carbonate) exoskeleton** around themselves for protection.
- ♦ **Coral reefs** are therefore created by **millions of tiny polyps forming large carbonate structures**.
- **Appearance:** Corals range in colour from **red to purple and even blue**, but are most commonly shades of **brown and green**.
  - ♦ They get most of their colours from the **millions of microscopic algae that grow inside each polyp's tissues**.
- **There are three types of coral reefs** – fringing reefs, barrier reefs and atolls.
  - ♦ Fringing reefs **form along shorelines**, **barrier reefs form in open water** and **atolls are circular reefs** that have formed around **sunken volcanos**.
- **Significance:** They provide food, shelter, resting and breeding grounds to a quarter of all marine life, acting as nurseries and refuges to protect critical biodiversity.
  - ♦ They also support more than 1 billion people living in coastal regions around the world by providing food, livelihoods and recreation.

Source: TH

## SHRINKFLATION

### In News

- As input prices turn inflationary, the fast-moving consumer goods (FMCG) segment can experience shrinkflation.

### About

- Shrinkflation is the practice by companies of reducing the size or quantity of a product while keeping the same price. For example: reducing the scoops of ice cream in a container or reducing the number of chips in a packet would count as shrinkflation.
- **Causes:** Rising production costs, Avoid sensitivity of consumers to price increases.

Source: FE

## MOUNT ETNA

### In News

- Volcanic vortex rings emerged from a new pit crater on the north side of the southeast crater of the Etna Volcano in Sicily, Italy.



### About Mount Etna



- It is an active stratovolcano volcano on the east coast of Sicily, the largest island in the Mediterranean Sea.

- Etna's peak is the highest in Italy south of the Alps, and it is Europe's largest and one of the most active volcanoes of the world
- Its summit has **five craters**, which are responsible for most of the volcano's eruptions.
- It lies above the convergent plate margin between the African Plate and the Eurasian Plate.
- It has been a UNESCO World Heritage Site since 2013.

Source: TH

