

# CURRENT AFFAIRS

WEEKLY

WEEK - 3  
JANUARY, 2020

MAINS

## ECONOMY

- Analysis of India's Chemical Industry
- A new controversy on India's Fiscal Deficit

## ENVIRONMENT & ECOLOGY

- Reading the new State of Forest Report 2019

## INTERNATIONAL RELATIONS

- Statue of Unity finds place in '8 Wonders of SCO'

## POLITY & GOVERNANCE

- Centre-State disputes and Article 131
- How Malappuram topped the list of world's 'Fastest Growing Cities'

## SCIENCE & TECHNOLOGY

- Goldilocks Zone
- H9N2
- NASA's Artemis mission, and the Indian American in its new astronaut cohort
- NEON: The Virtual Human
- The First 3-D Model of GluD1 Receptor

## ECONOMY

- The significance of the Kolkata port

## ENVIRONMENT & ECOLOGY

- A Giant fish is declared extinct
- Diego- the giant tortoise Green Credit Scheme
- Highest number of wetland species in Kaziranga

## HISTORY

- Highest number of wetland species in Kaziranga

## INTERNATIONAL RELATIONS

- JUS COGENS  
Nepal's Seke 'near-extinct'

## POLITY & GOVERNANCE

- How is a language declared 'classical' in India, what benefits it enjoys
- Private Property is a human right: SC

PRELIMS

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The current affairs articles are segregated from prelims and mains perspective, such separation is maintained in terms of structure of articles. Mains articles have more focus on analysis and prelims articles have more focus on facts.

However, this doesn't mean that Mains articles don't cover facts and PT articles can't have analysis. You are suggested to read all of them for all stages of examination.

# CURRENT AFFAIRS ANALYST

WEEK-3 (JANUARY, 2020)

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**SECTION: A**  
**(MAINS)**

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**CURRENT AFFAIRS**

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# A NEW CONTROVERSY ON INDIA'S FISCAL DEFICIT

## CONTEXT

- Former Economic Affairs secretary, has claimed that the actual fiscal deficit for the last financial year and the current one is more than a full percentage point higher than the official data.
- India's fiscal deficit, which essentially maps how much money the Indian government has to borrow to make up the gap between its expenditure and its revenues, was just 3.4 per cent of the gross domestic product (GDP) for 2018-19.

## ABOUT

### Current Scenario-

- All government expenditure, revenues and debts are required to be carried out through the Consolidated Fund of India (CFI).
- If it is done so, the fiscal deficit of the Government should equal to the additional debt incurred during the year, all recorded in the CFI.
- But all these transactions are not recorded through the CFI all the time. Some debt/liabilities are not assumed outside the CFI — either in the Public Account or totally outside the formal accounting system of the Government i.e. outside CFI and Public Account. Such transactions are described popularly as Below the Line, Off Budget etc.
- Equity infusion in the Public Sector Banks (PSBs), during last few years, has been done by deducting debt received by the Government of India in from the PSBs from the equity investments made.
- As a result, there is no impact of such expenditure/investment on fiscal deficit but the debt and liabilities stock of the Government goes up.

### Fiscal Deficit:

- Fiscal Deficit is the difference between the Revenue Receipts plus Non-debt Capital Receipts (NDCR) and the total expenditure.
- In other words, fiscal deficit is "reflective of the total borrowing requirements of Government".
- The gross fiscal deficit (GFD) is the excess of total expenditure including loans net of recovery over revenue receipts (including external grants) and non-debt capital receipts.
- The net fiscal deficit is the gross fiscal deficit less net lending of the Central government.

### Significance of fiscal deficit:

- The significance of fiscal deficit is that if this ratio is too high, it implies that there is a lesser amount of money left in the market for private entrepreneurs and businesses to borrow.

- Lesser amount of this money, in turn, leads to higher rates of interest charged on such lending.
- A higher fiscal deficit means higher borrowing by the government, which, in turn, mean higher interest rates in the economy.
- A high fiscal deficit and higher interest rates at a current scenario like this would also mean that the efforts of the Reserve Bank of India to reduce interest rates are undone.

### Implications of Fiscal Deficit:

- **Debt Trap:** Borrowings not only involve repayment of principal amount, but also require payment of interest. Interest payments increase the revenue expenditure, which leads to revenue deficit. It creates a vicious circle of fiscal deficit and revenue deficit, wherein government takes more loans to repay the earlier loans. As a result, country is caught in a debt trap.
- **Inflation:** Government mainly borrows from Reserve Bank of India (RBI) to meet its fiscal deficit. RBI prints new currency to meet the deficit requirements. It increases the money supply in the economy and creates inflationary pressure.
- **Foreign dependence:** Government also borrows from rest of the world, which raises its dependence on other countries.

### Acceptable level of fiscal deficit?

- There is no set universal level of fiscal deficit that is considered good. Typically, for a developing economy, where private enterprises may be weak and governments may be in a better state to invest, fiscal deficit could be higher than in a developed economy.
- In developing economies, governments also have to invest in both social and physical infrastructure upfront without having adequate avenues for raising revenues.
- In India, the Fiscal Responsibility and Budget Management Act requires the central government to reduced its fiscal deficit to 3 per cent of GDP. India has been struggling to achieve this mark.

### Financing a Deficit

- All deficits need to be financed. This is initially done through the sale of government securities, such as Treasury bonds (T-bonds).
- Individuals, businesses, and other governments purchase Treasury bonds and lend money to the government with the promise of future payment.
- The clear, initial impact of government borrowing is that it reduces the pool of available funds to be lent to or invested in other businesses.

### Recent steps by Govt-

- Government of India is recently issuing Fully Serviced Bonds (FSBs). These bonds are raised outside the CFI and Public Account and used from special purpose vehicles outside budget/ accounts to pay off the government expenditure/ subsidy.
- Interest and principals of these liabilities are serviced by the Government at the time of payment. These bonds don't enter into calculations of either fiscal deficit or the debt and liabilities of the Government.
- The government has also been paying off food subsidy liability by providing cash from the National Small Savings Fund (NSSF).
- Such transactions have the effect of reducing fiscal deficit and not showing up in the Debt and Liabilities of the Government.

### Recent trends-

- Fiscal deficit of the Union government rose to 114.8 per cent of the target in the first eight months of the fiscal year as per the data released by the Controller General of Accounts.
- The gap between the government's revenue and spending is at Rs 8.07 trillion at the end of November — Rs 1 trillion (13 per cent) more than the full-year target.
- A persistent contraction in gross tax revenue, with expenditure growing consistently, has put pressure on government finances, resulting in a larger deficit

- The corporation tax collection contracted to 1 per cent in April–November on the revenue side, budgetary capital spending on roads took the worst hit on the expenditure side.
- Income support to farmers and food subsidy bills have taken a graver hit in terms of revenue expenditure.

### Measures need to be taken-

- Fiscal consolidation is important from the point of view of the credibility of policy-making.
- A drastic reduction in expenditure on major subsidies such as food, fertilisers, exports, electricity to curtail public expenditure. A huge sum of money equal to Rs. 20,000 crores are spent on major subsidies on food, fertilisers, export promotion by the central government.
- Interest payments account for about 40 per cent of expenditure on revenue account of the central government. Funds raised through disinvestment in the public sector should be used to retire a part of old public debt rather than financing current expenditure.
- To reduce fiscal deficit and thereby check rise in inflation rate, apart from reducing government expenditure, government revenue has to be raised.
- To increase revenue from taxation, tax base should be broadened by taxing agricultural incomes and incomes derived from unorganised industrial and services sectors.
- There should be restructuring of public sector enterprises so that they should make some surpluses at least for their own development so that their dependence on government's budgetary resources should be dispensed with. For this purpose, their pricing policy should be such that it recovers at least user cost.

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# ANALYSIS OF INDIA'S CHEMICAL INDUSTRY

## CONTEXT

- India's chemical industry, the sixth-largest in the world, continues to expand dangerously.

### ◎ BACKGROUND

#### India's Chemical Industry:

- India's Chemicals industry is highly diversified, covering more than 80,000 commercial products.
- It is broadly classified into Bulk chemicals, Specialty chemicals, Agrochemicals, Petrochemicals, Polymers and Fertilizers.
- India is a strong global dye supplier, accounting for approximately 16% of the world production of dyestuff and dye intermediates.
- In 2017-18, the sector produced 49 million tonnes of chemicals and petrochemicals. Alkaline accounts for 69 per cent of India's chemical production and polymer accounts for 59 per cent of petrochemical production.
- The domestic chemicals industry will reach \$304 billion by 2025 from the current \$163 billion.
- Furthermore, India will develop manufacturing hubs at Dehej in Gujarat, Vishakhapatnam in Andhra Pradesh, Paradip in Odisha and Cuddalore in Tamil Nadu.
- 100% FDI is allowed under the automatic route in the chemicals sector (except in the case of certain hazardous chemicals).

### ◎ ANALYSIS

#### Importance of India's Chemical Industry:

- **Economic growth:** The chemical industry's role as the key enabler of economic growth is well-established worldwide. From the ubiquitous cellphone to solar panels producing carbon-free energy, to LED lights providing efficient lighting—all are made possible by chemical industry products.
- **Improving the standard of life:** In India, the chemical industry occupies a pivotal position in meeting basic needs and improving the quality of life as well.
- **A contributor to GDP:** The sector overall contributes to about three percent of India's gross domestic product (GDP).
- **Serving all sectors:** The chemical industry is critical for the economic development of any country, providing key products and enabling technical solutions in virtually all sectors of the economy.

#### Challenges & Issues:

- **Lack of proper knowledge:** India does not have an exhaustive inventory on the chemicals being used and their associated risks. The country does not have proper knowledge of the chemicals being used. So, several chemicals banned internationally continue to be used in India.
- **Major accidents:** India, on an average recorded over four major chemical accidents every month in the past three years (Bhopal Gas Tragedy). The 152 recorded accidents are underestimated as most cases go unregistered.



#### Bhopal Gas Tragedy:

- Post-midnight on December 3, 1984, poisonous gas leaked from the factory of Union Carbide in Bhopal, Madhya Pradesh, which killed thousands of people directly.
- The incident is now known as the Bhopal disaster or Bhopal gas tragedy.
- About 40 tonnes of methyl isocyanate (MIC) gas and other chemicals leaked from the Union Carbide factory.
- Methyl isocyanate is extremely toxic and if its concentration in the air touches 21ppm (parts per million), it can cause death within minutes of inhaling the gas. In Bhopal, the level was multiple times higher.
  - ▶ Even 35 years after the Bhopal gas tragedy, India has not banned Methyl isocyanate.
  - ▶ The government in August 2018 reluctantly banned Carbaryl Sevin, the insecticide the Union Carbide plant was manufacturing in Bhopal.

- ▶ Methyl isocyanate is still legally used in the country to make polyurethane, a form of plastic.
- India took a hard stance against the sector after the Bhopal gas tragedy. But it went soft after economic liberalisation in 1992 to attract investment.
- **A source of hazardous waste:** Besides accidents, the chemical industry is also a major source of hazardous waste, which, if not handled properly, can lead to widespread contamination. There are around 56,350 industrial units that produce 7.7 million tonnes of hazardous waste every year, as per the Hazardous Waste Inventory Report 2016-17.
- **Lack of data:** Lack of data is the other big problem. "Many organisations are involved in collecting data — the database on pesticides, industrial chemicals and chemical wastes is encouraging. However, with respect to consumer chemicals, attention is needed.
- **Lack of coordination:** There is no coordination between the customs department and environment ministry to prevent illegal activities. Due to this, importers constantly violate the Customs Act, 1962. Cargos are given clearances without being emptied every day. Importers use their own software and provide wrong information to the department.
- **Poor legal regulation:** India has over 15 Acts and 19 rules that govern different aspects of the chemical industry. Yet none of the acts have been designed exclusively for the industry.
  - ▶ **The Central Motor Vehicles Rules, 1989,** deals with all aspects of road transportation in general and also specifically addresses transportation of hazardous goods, including chemicals.
  - ▶ **The Environment (Protection) Act, 1986,** currently serves as the umbrella act when it comes to the chemical industry, suggests the National Chemical Management Profile for India report, released in 2005-06 by the Ministry of Environment, Forest and Climate Change (MoEFCC) and the Central Pollution Control Board (CPCB).
  - ▶ The national chemical policy has been pending since 2012.
- **Confusing monitoring:** There is no rationale behind having so many Union ministries looking after one sector. It leads to over interference and little work.

#### How the sector is monitored?

- Currently, nine Union ministries have a stake in the sector:
- **Ministry of Environment, Forest and Climate Change** is the nodal ministry to enforce the Environment (Protection) Act, 1986.
- **The Ministry of Commerce and Industry,** along with the **Ministry of Finance,** take care of import and export of chemicals.
- **The Ministry of Health and Family Planning,** along with the **Ministry of Agriculture and Farmers' Welfare,** are concerned with laws that handle consumer interest.
- **The Ministry of Road Transport and Highways,** along with the **Ministry of Shipping,** ensure implementation of transportation laws.
- **The Ministry of Labour and Employment** is concerned with the safety and occupational health and, the **Ministry of Commerce and Industry** is concerned with the use of explosives.

#### Chemicals to look for:

- **Organophosphate pesticides:** They are a class of neurotoxic chemicals used as warfare agents in the 1930s. However, today, they are widely used. They can make their way onto crops that we use as food sources. Areas that spray pesticides heavily, such as farms, may find higher rates of exposure.
- **Polybrominated diphenyl ethers:** They are used as flame retardants, chemicals that can slow the speed of a flame. They can be found in televisions, computers, insulation and foam products, including children's toys and baby pillows.
- **Phthalates:** These chemicals soften plastics and help scents and chemicals bind together. Exposure to phthalates has been associated with lower IQ levels. They can be found in shampoos, conditioners, body sprays, hair sprays, perfumes, colognes, soap, nail polish, shower curtains, medical tubing, IV bags, vinyl flooring and wall coverings, food packaging and coatings on time-release pharmaceuticals.
- **Polychlorinated biphenyls:** Polychlorinated biphenyls are associated with cancer in occupational settings and has been associated with issues with motor skills and short term memory in children.
- **Nonylphenol (NP):** NP is a persistent, toxic, bio-accumulative chemical which acts as a hormone disruptor and can be responsible for a number of human health effects. It is found in detergents.
- **Lead:** Lead is a naturally occurring metal. It is used in a variety of products like industrial paints, car batteries and wheel weights. It can also make its way into water, because of corrosion from old

water pipes. Lead exposure has been associated with ADHD, lower IQs and developmental delay.

**Suggestive measures:**

- Currently, the weakest factors are inspection, vigilance and public awareness. To correct this, we need standardised procedures and personnel for inspection and vigilance.
- The European Union has effective regulations like the Registration, Evaluation, Authorisation and Restriction of Chemicals and India needs similar regulation.
- In order to grow in a sustainable way, the industry need to address matters and activities related to water, environmental impact, raw materials, and energy use in the Indian chemical industry.
- The Indian chemical industry needs to upgrade its technology to meet world standards and show improved performance in global trade.
- India urgently needs a National Chemicals Policy, which has been pending since 2008 with few signs of progression.

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# READING THE NEW STATE OF FOREST REPORT 2019

## CONTEXT

- **State of Forest Report 2019 has shown a 1,275 sq km gain in very dense forest, but what this statistic masks is the fact that the country continues to lose its best natural forests. A look at what was gained and lost**

### ◎ BACKGROUND

- The report is published by the Forest Survey of India (FSI) which has been mandated to assess the forest and tree resources of the country including wall-to-wall forest cover mapping in a biennial cycle.
- Starting 1987, 16 assessments have been completed so far. ISFR 2019 is the 16th report in the series.
- India is among few countries in the world where forest cover is consistently increasing.
- The total forest and tree cover of the country is 80.73 million hectare which is 24.56 percent of the geographical area of the country.
- Compared to the assessment of 2017, there is an increase of 5,188 sq. km in the total forest and tree cover of the country.
- Out of this, the increase in the forest cover has been observed as 3,976 sq km and that in tree cover is 1,212 sq. km; Range increase in forest cover has been observed in open forest followed by very dense forest and moderately dense forest and the top three states showing increase in forest cover are Karnataka (1,025 sq. km) followed by Andhra Pradesh (990 sq km) and Kerala (823 sq km)."

### Some Major Findings of the report

- Area-wise Madhya Pradesh has the largest forest cover in the country followed by Arunachal Pradesh, Chhattisgarh, Odisha and Maharashtra.
- In terms of forest cover as percentage of total geographical area, the top five States are Mizoram (85.41%), Arunachal Pradesh (79.63%), Meghalaya (76.33%), Manipur (75.46%) and Nagaland (75.31%).
- The Mangrove ecosystems are unique & rich in biodiversity and they provide numerous ecological services.
- Mangrove cover has been separately reported in the ISFR 2019 and the total mangrove cover in the country is 4,975 sq km.
- An increase of 54 sq Km in mangrove cover has been observed as compared to the previous assessment of 2017.
- Top three states showing mangrove cover increase are Gujarat (37 sq km) followed by Maharashtra (16 sq km) and Odisha (8 sq km).

- The total growing stock of India's forest and TOF is estimated 5,915.76 million come of which 4,273.47 million come inside the forests and 1,642.29 million come outside.
- There is an increase of 93.38 million come of total growing stock, as compared to the previous assessment.
- Out of this the increase in growing stock, there is an increase of 55.08 million come inside the forests and 38.30 million come outside the forest areas.
- The extent of bamboo bearing area of the country has been estimated 16.00 million hectare.
- There is an increase of 0.32 million hectare in bamboo bearing area as compared to the last assessment of ISFR 2017.
- The total estimated green weight of bamboo culms is 278 million tonnes, slowly an increase of 88 million tonnes as compared to ISFR 2017.
- Under the current assessment the total carbon stock in country's forest is estimated 7,124.6 million tonnes and there an increase of 42.6 million tonnes in the carbon stock of country as compared to the last assessment of 2017.
- The annual increase in the carbon stock is 21.3 million tonnes, which is 78.2 million tonnes CO<sub>2</sub> eq.
- Wetlands within forest areas form important ecosystems and add richness to the biodiversity in forest areas, both of faunal and floral species. Due to importance of wetlands, FSI has carried out an exercise at the national level to identify wetlands of more than 1 ha within RFA.
- There are 62,466 wetlands covering 3.8% of the area within the RFA/GW of the country.

### Methodology used for the survey

- In tune with the Government of India's vision of Digital India, FSI's assessment is largely based on digital data whether it is satellite data, vector boundaries of districts or data processing of field measurements.
- The report provides information on forest cover, tree cover, mangrove cover, growing stock inside and outside the forest areas, carbon stock in India's forests, Forest Types and Biodiversity, Forest Fire monitoring and forest cover in different slopes & altitudes.

- Special thematic information on forest cover such as hill, tribal districts, and north eastern region has also been given separately in the report.
- The biennial assessment of forest cover of the country using mid-resolution Satellite data is based on interpretation of LISS-III data from Indian Remote Sensing satellite data Resourcesat-II.
- This information provides inputs for various global level inventories, reports such as GHG Inventory, Growing Stock, Carbon Stock, Forest Reference Level (FRL) and international reporting to UNFCCC, targets under CCD, Global Forest Resource Assessment (GFRA) done by FAO for planning and scientific management of forests.
- For the first time, Ortho-rectified satellite data has been used for forest cover mapping due to its better positional accuracy as it removes effects of image perspective (tilt) and relief (terrain) and scale distortions in the image to represent features in its true positions for accurate measurement of distances, angles and areas.
- FSI, in a first ever attempt has carried out a rapid assessment of biodiversity for all the States and UTs (except two) and for all the sixteen Forest Type Groups as per Champion & Seth Classification (1968).
- Apart from the number of tree, shrub and herb species as observed in the survey, **Shanon Wiener Index which gives species richness** along with the relative abundance, has also been calculated for each forest type groups in each State & UT.
- FSI has carried out mapping of forest types of India as per the Champion & Seth Classification (1968), for the first time in the year 2011 based on the base line forest cover data of 2005.

### Other Major Highlights

- A study to assess the dependence of the people living in close proximity to forests for their day to day needs like fuel wood, fodder, small timber and bamboo was undertaken by FSI.
- The present report also gives information on the fire prone forest areas of different severity classes, mapped in the grids of 5km x 5km based on the frequency of forest fires in the last 14 years that would enable the SFDs to manage and control forest fires effectively in the respective States.
- Non Timber Forest Produce (NTFP) are important source of livelihood for many tribal communities and villagers living in the proximity of forests.
- New information has been generated from the national forest inventory data about the top five NTFP species in each State & UT in terms of their availability in forests i.e. relative occurrence.
- Invasive species pose serious threat to the sustainable management of forests. Analysis of NFI data has been done for determining five major invasive species in each State & UT and also an estimate of area affected by them.
- The information given in the report would provide valuable information for policy, planning and sustainable management of forest and tree resources in the country.

### Objectives of the Nation-Wide Forest Cover Mapping

- To monitor forest cover and changes therein at the National, State and District levels
- To generate information on forest cover in different density classes and changes therein
- To produce forest cover and other thematic maps derived from it for the whole country
- To provide primary base layer for assessment of different parameters including growing stock, forest carbon etc
- To provide information for international reporting

### Limitations of the Forest Cover Mapping

- Since the resolution of the LISS III sensor data is 23.5 m, land cover features having a geometric dimension less than 23.5 m on the ground are not discernible.
- Considerable ground details may sometimes be obscured due to clouds and shadows. Such areas can be discerned to a certain extent with the help of collateral data and image processing techniques, but not always.
- Non-availability of appropriate season data sometimes puts constraints on the interpretation of the features owing to poor reflectance of data and phenological changes in forests.
- Occurrence of weeds like lantana in forest areas and agricultural crops like sugarcane, cotton, etc adjacent to forests, causes mixing of spectral signatures and often make precise forest cover delineation difficult.
- Young plantations and tree species with less chlorophyll or inadequate foliage, many a times are not discernable on satellite images due to inadequate reflectance.
- Haze and other atmospheric distortions pose difficulty in interpretation, especially in the coastal areas.

Forest Cover of India		
Class	Area (sq km)	Percentage of Geographical Area
Very Dense Forest	99,278	3.02
Moderately Dense Forest	3,08,472	9.39
Open Forest	3,04,499	9.26
Total Forest Cover	7,12,249	21.67
Scrub	46,297	1.41
Non-Forest	25,28,923	76.92
Total Geographical Area	32,87,469	100.00

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# STATUE OF UNITY FINDS PLACE IN '8 WONDERS OF SCO'

## CONTEXT

- The 182-meter tall Statue of Unity in Gujarat has been included in the Shanghai Cooperation Organisation's '8 Wonders of SCO' list.

### ◎ BACKGROUND

- The Statue of Unity depicts Sardar Vallabhbhai Patel (1875–1950), a leading figure in the nonviolent Indian Independence Movement.
- The Statue of Unity is the world's tallest statue, with a height of 182 metres (597 feet) which is almost double the height of the Statue of Liberty, USA.
- The height of the toe of the Statue of Unity measures 3.6 metre. It replaced the Spring temple of Buddha in China to become the tallest statue in the world.
- It was inaugurated in October 2018 on the occasion of Sardar Vallabhbhai Patel's 143rd birth anniversary

### ◎ ANALYSIS

#### Contribution of Sardar Vallabhbhai Patel in India's history:

- Sardar Vallabhbhai Patel, born in Nadiad, Gujarat, on October 31, 1875, was India's first Home Minister and also the first Deputy Prime Minister.
- Today, his birth anniversary is observed as **National Unity Day** or **Rashtriya Ekta Diwas**.
- Known as the 'Ironman' of India, Sardar Vallabhbhai Patel was instrumental in India's independence struggle, and then for the integration of 562 princely states into the Union of India.
- **Removing sexual disqualification:** Sardar happened to be the first to pitch for removing "sexual disqualification" in the District Municipal Act. The Act barred women from contesting elections as per Section 15(1)(C). Sardar had argued that keeping women out of the elected body was equivalent to eliminating the representation of half of the urban population. In 1926, Section 15(1)(c) was abolished.
- **Kheda Satyagraha:** He lent his active co-operation to Gandhiji for the first time in the Kheda Satyagraha of 1918.
- **Agitation against Rowlatt Act:** The historic agitation against Rowlatt Act initiated by Mahatma Gandhi in 1919 brought Sardar Vallabhbhai Patel into prominence as a popular leader in Western India. He led the agitation in Gujarat.
- Sardar Patel participated in the 1930 Salt Satyagraha and for this he was sentenced to three months imprisonment.
- In 1931, Sardar Patel headed the Karachi session of the Indian National Congress (INC).
- During Quit India Movement (1942), he got arrested and imprisoned from 1942 to 1945 at the fort in Ahmednagar.
- In 1937 elections, he led the Congress Party and was a major contender for the post of Congress President for 1937 but due to Gandhi's pressure, Patel withdrawn nomination and Jawaharlal Nehru was elected congress President.







#### About Shanghai Cooperation Organisation (SCO):

- The Shanghai Cooperation Organisation (SCO) is a permanent intergovernmental international organisation, the creation of which was announced on 15 June 2001 in Shanghai (China) by the Kazakhstan, China, Kyrgyzstan, Russia, Tajikistan, and Uzbekistan. It was preceded by the Shanghai Five mechanism.
- The SCO Charter was signed during the St.Petersburg SCO Heads of State meeting in 2002, and entered into force on 19 September 2003.
- This is the fundamental statutory document which outlines the organisation's goals and principles, as well as its structure and core activities.
- The aim of SCO is to establish cooperation between member nations on:
  - ▶ Security-related concerns
  - ▶ Resolving border issues
  - ▶ Military cooperation
  - ▶ Intelligence sharing
  - ▶ Countering terrorism
  - ▶ Countering American influence in Central Asia
- The historical meeting of the Heads of State Council of the Shanghai Cooperation Organisation was held on 8-9 June 2017 in Astana.
- On the meeting the status of a full member of the Organization was granted to the Republic of India and the Islamic Republic of Pakistan.
- Thus, currently:


- ▶ **Member states:** the SCO comprises eight member states, namely the Republic of India, the Republic of Kazakhstan, the People’s Republic of China, the Kyrgyz Republic, the Islamic Republic of Pakistan, the Russian Federation, the Republic of Tajikistan, and the Republic of Uzbekistan;
- ▶ **Observer States:** the SCO counts four observer states, namely the Islamic Republic of Afghanistan, the Republic of Belarus, the Islamic Republic of Iran and the Republic of Mongolia;
- ▶ **Dialogue partners:** the SCO has six dialogue partners, namely the Republic of Azerbaijan, the Republic of Armenia, the Kingdom of Cambodia, the Federal Democratic Republic of Nepal, the Republic of Turkey, and the Democratic Socialist Republic of Sri Lanka.

- The SCO included the Statue of Unity among the list of eight wonders among the member nations to promote tourism among member states.

○ The Eight Wonders of the SCO are:

S.No	Wonders of SCO	Country	
1.	The Statue of Unity	India	
2.	The Archaeological Landscape of Tamgaly	Kazakhstan	
3.	The Daming imperial palace complex	China	
4.	Lake Issyk-Kul	Kryrgyzstan	
5.	The Great Mughals’ heritage at Lahore	Pakistan	
6.	The Golden Ring cities	Russia	



7.	The Palace of Nowruz	Tajikistan	
8.	The Poi Kalon complex	Uzbekistan	

**India & SCO:**

- **A platform to connect with Central Asia:** SCO is a potential platform to advance India's Connect Central Asia policy. 2020 will mark the first time India hosts the annual Shanghai Cooperation Organization (SCO) summit.
- **Economics & geopolitics benefits:** The SCO's significance for India lies in economics and geopolitics. Having begun as the Shanghai Five in 1996 and rechristened as the SCO in 2001, the member states occupy the huge landmass adjacent

to India's extended neighbourhood where India has both economic and security imperatives.

- **Economic cooperation:** The moot point for India's strategy at the SCO, is to enhance economic cooperation with the Eurasian states and benefit from the security framework.
- **Leverage to win big:** The summit represents a structured forum where India can leverage its interests that would help it both on the domestic and the international front.

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# HOW MALAPPURAM TOPPED THE LIST OF WORLD'S 'FASTEST GROWING CITIES'

## CONTEXT

- The Economist put Malappuram at the top of the “Top ten fastest-growing cities” in the world, based on “Total % change, 2015-20 forecast”. The list is based on data from the United Nations Population Division.

### ◎ BACKGROUND

- The list based on data from the United Nations Population Division, appears unusual because the total fertility rate in Kerala is 1.8 as per NITI Aayog data from 2016 which is below the replacement rate of 2.1.
- Another Kerala city, Thrissur, is No. 13, and the capital Thiruvananthapuram is No. 33 on the UN list.
- Tiruppur in Tamil Nadu which has an even lower TFR of 1.6 is No. 30. Surat in Gujarat (TFR of 2.2) is No. 27.
- There is no representation on the list from high population growth states like Bihar and UP.

### Does “fastest growing” refer to population? How is a “city” defined?

- The UN list refers to “urban agglomerations” (UA), which are extended areas built around an existing town along with its outgrowths — typically villages or other residential areas or universities, ports, etc., on the outskirts of the town.
- The Census defines a UA as “a continuous urban spread consisting of a town and its adjoining urban outgrowths or two or more physically contiguous towns together”.

- The Economist has listed the rate at which the populations of the UAs are expected to increase between 2015 and 2020.
- The rate of growth between 2015 and 2020 thus calculated provides a measure of the pace of urbanisation.

### How does urban population grow?

- Urban populations can grow when the birth rate exceeds the death rate (natural growth).
- When workers migrate to the city in search of jobs.
- When more areas get included within the boundaries of the city
- When existing rural areas are reclassified as urban.
- The low fertility rate in Kerala means the increase in the population of Malappuram and other cities is not because women are having more children; rather it is because more villages are being transformed into towns, and city borders are expanding.
- According to the Census definition, an urban area is either a census town (CT) or a statutory town (ST).
- An ST is any place with a municipal corporation, municipal council, or cantonment board.
- A CT can be a village with “urban characteristics” — a population more than 5,000, population density more than 400 people per sq km and with more than 75% of the population not engaged in agriculture for their livelihood.
- When a village becomes a CT, its population is included in the urban population of the district.

### Could migration have caused the increase?

- Migration can either increase or decrease the population of a town.
- Kerala sees both emigration — migration from the state to other places — and immigration — the migration of workers to the state
- The remittances that emigrants send allow the residents of villages to move away from agriculture, which changes the status of a village to census town.

### PACE OF URBANISATION MOST TRAPID IN KERALA

FASTEST GROWING URBAN AGGLOMERATIONS, 2015-20	FASTEST GROWING INDIAN URBAN AGGLOMERATIONS, 2015-20 (Rate of growth in per cent)
1. Malappuram, India	Malappuram : 44.05
2. Suqian, China	Kozhikode : 34.51
3. Can Tho, Vietnam	Kollam : 30.99
4. Kozhikode, India	Thrissur : 30.22
5. Abuja, Nigeria	Surat : 26.69
6. Suzhou, China	Tiruppur : 26.21
7. Sharjan, UAE	Thiruvananthapuram : 22.57
8. Putian, China	Raipur : 22.21
9. Muscat, Oman	Kochi : 21.87
10. Dar-es-Salam, Tanzania	Bangalore : 21.55
11. Kollarn, India	Indore : 19.01
12. Wuhu, China	Kota : 18.76
13. Thrissur, India	Vijayawada : 18.61
14. Yaounde, Cameroon	Rajkot : 17.21
15. Batam, Indonesia	Moradabad : 17.11

### Top ten fastest-growing cities

Total % change, 2015-20 forecast

Malappuram, India	44.1
Can Tho, Vietnam	36.7
Suqian, China	36.6
Kozhikode, India	34.5
Abuja, Nigeria	34.2
Suzhou, China	32.5
Putian, China	32.2
Sharjah, UAE	32.2
Muscat, Oman	31.4
Kollam, India	31.1

### Why are Malappuram (44%), Kozhikode (34.5%), and Kollam (31%) growing so fast?

- These cities are seeing rapid urbanisation, and the main reason is the inclusion of new areas in the UA's limits.
- In 2001, there were two municipal corporations within the UA of Malappuram. In 2011, the number of municipal corporations had doubled to four, and an additional 37 CTs were included within Malappuram.
- The population of the UA (excluding the residents of the outgrowths) increased almost 10 times in the same period because of the inclusion of existing urban areas in the town.
- Similarly, Kollam UA grew from one municipal corporation in 2001 to 23 CTs, one municipal corporation, and one municipal council in 2011.
- Its population increased by 130%, even though the population of the original ST of Kollam actually decreased by 4%.

### Why is this not seen elsewhere in India?

- In Kerala, urbanisation is driven by a move away from agriculture, which leads to a change in a village's Census classification status.
- This is evident from the large number of CTs that were included in the UAs of the state since the last Census.
- On the other hand, except Delhi, the more populous cities in the North had fewer CTs in 2011.
- While the pace of urbanisation has been slower in the North, some unnaturally high increases in the population can be expected after the 2021 Census because in some cases, villages on the peripheries were brought within the administrative boundaries of the cities.

### But is this kind of increased urbanisation good for the economy? /Way forward

- It has both positive and negative sides. Urbanisation leads to the growth of cities, which are sites of infrastructure like universities, hospitals, and public transport facilities.
- There are more opportunities for the youth, which is why they attract young people and entrepreneurs.
- In India, people moving to cities leave behind (to some extent) caste and class divisions that dominate life in the villages, and can hope to climb up the social ladder.
- However, unplanned urbanisation can be "exclusionary", making it difficult for migrants to live there given the high cost.
- "Unregulated housing, lack of reliable public transport, and longer commutes within these towns puts a strain on the meagre resources of migrants.

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# CENTRE-STATE DISPUTES AND ARTICLE 131

## CONTEXT

- Kerala has recently become the first state to challenge the Citizenship (Amendment) Act (CAA) before the Supreme Court.
- However, the Kerala government has moved the apex court under Article 131 of the Constitution.
- Besides, the Chhattisgarh government has also filed a suit in the Supreme Court under Article 131, challenging the National Investigation Agency (NIA) Act on the ground that it encroaches upon the state's powers to maintain law and order

## ◎ ABOUT

- Under Article 131 of the Constitution, the provision under which the Supreme Court has original jurisdiction to deal with any dispute-
  - ▶ between the Government of India and one or more States; or
  - ▶ between the Government of India and any State or States on one side and one or more other States on the other; or
  - ▶ between two or more States, if and in so far as the dispute involves any question (whether of law or fact) on which the existence or extent of a legal right depends.

### What is Article 131?

- The Supreme Court has three kinds of jurisdictions: original, appellate and advisory.
- Under its advisory jurisdiction, the President has the power to seek an opinion from the apex court under Article 143 of the Constitution.
- Under its appellate jurisdiction, the Supreme Court hears appeals from lower courts.
- In its extraordinary original jurisdiction, the Supreme Court has exclusive power to adjudicate upon disputes involving elections of the President and the Vice President, those that involve states and the Centre, and cases involving the violation of fundamental rights.

### Criteria:

- For a dispute to qualify as a dispute under Article 131, it has to necessarily be between states and the Centre, and must involve a question of law or fact on which the existence of a legal right of the state or the Centre depends.
- In a 1978 judgment, State of Karnataka v Union of India, Justice P N Bhagwati had said that for the Supreme Court to accept a suit under Article 131, the state need not show that its legal right is violated, but only that the dispute involves a legal question.

- Article 131 cannot be used to settle political differences between state and central governments headed by different parties.

### How is this move different?

- The other petitions challenging the CAA have been filed under Article 32 of the Constitution, which gives the court the power to issue writs when fundamental rights are violated.
- A state government cannot move the court under this provision because only people and citizens can claim fundamental rights.
- Under Article 131, the challenge is made when the rights and power of a state or the Centre are in question.
- However, the relief that the state (under Article 131) and petitioners under Article 32 have sought in the challenge to the CAA is the same — declaration of the law as being unconstitutional.

### Can the Supreme Court declare legislation unconstitutional under Article 131?

- A 2012 dispute between Bihar and Jharkhand that is currently pending for consideration by a larger Bench deals with the issue of liability of Bihar to pay pension to employees of Jharkhand for the period of their employment in the former, undivided Bihar state.
- Although earlier judgments had held that the constitutionality of a law can be examined under Article 131, a 2011 judgment in the case of State of Madhya Pradesh v. Union of India ruled otherwise.
- Since the 2011 case was also by a two-judge Bench and was later in time, the court could not overrule the case. However, the judges did not agree with the ruling.

### Can the Centre too sue a state under Article 131?

- The Centre has other powers to ensure that its laws are implemented. The Centre can issue directions to a state to implement the laws made

by Parliament

- If states do not comply with the directions, the Centre can move the court seeking a permanent injunction against the states to force them to comply with the law.
- Non-compliance of court orders can result in contempt of court, and the court usually hauls up the chief secretaries of the states responsible for implementing laws.

**Is it unusual for states to challenge laws made by Parliament?**

- Under the Constitution, laws made by Parliament are presumed to be constitutional until a court holds otherwise.
- However, in India's quasi-federal constitutional structure, inter-governmental disputes are not uncommon.
- Original jurisdiction of the Supreme Court has been added in the constitution for their resolution. The quasi-federal structure envisaged in 1950 has consolidated into defined powers of the states.

- Under a powerful Centre with a clear majority in Parliament, fault lines in India's federal structure are frequently exposed.
- Since 2014, when the government came to power, debates around the 15th Finance Commission, the Goods and Services Tax, the linguistic divide on the National Education Policy, land acquisition, and the proposed All India Judicial Services have all emerged as flashpoints between the strong Centre and states ruled by the Opposition.

**The disputes which Parliament, by law, is authorized to exclude the jurisdiction of the Supreme Court are:**

- Disputes relating to water (article 262).
- Matters referred to the Finance Commission.
- Adjustment of certain expenses between the Union and the states under Article 290.
- Disputes specified in the provision to Articles 131 and 363(1).
- Adjustment of expenses between the Union and the states under Articles 257 (4) and 258(3).

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# **SECTION: B**

## **(PRELIMS)**

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### **CURRENT AFFAIRS**

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## 'THE SIGNIFICANCE OF THE KOLKATA PORT'

### ◎ CONTEXT

- In a recent development, Prime Minister Narendra Modi renamed the Kolkata Port Trust after Bharatiya Jana Sangh (BJS) founder Dr Syama Prasad Mookerjee, at an event to mark its 150th anniversary.

#### About Kolkata Port:

- Kolkata Port is the only riverine Major Port in India, situated 232 kilometers up-stream from the Sandheads, having arguably the longest navigational channel amongst Major Ports of India and its navigational channel is one of the longest in the world.
- KoPT is India's oldest operational port and the first among the 12 major ports (government-owned) of India. Kolkata Port System includes three ports:
  - Kolkata
  - Haldia
  - Sagar Island
- The port facility has aided in industrialization, employment generation and major economic activity in the region while serving a vast hinterland as well as landlocked neighbouring countries such as Bhutan and Nepal.
- The river Hooghly, on which it is located, has many sharp bends, and is considered a difficult navigational channel.
- Throughout the year, dredging activities have to be carried out to keep the channel open.
- The **Farakka Barrage**, built in 1975, reduced some of the port's woes as Ganga waters were diverted into the **Bhagirathi-Hooghly system**.

#### Historical background:

- In the early 16th century, the Portuguese first used the present location of the port to anchor their ships, since they found the upper reaches of the Hooghly river, beyond Kolkata, unsafe for navigation.
- **Job Charnock**, an employee and administrator of the **East India Company**, is believed to have founded a trading post at the site in 1690. Since the area was situated on the river with jungle on three sides, it was considered safe from enemy invasion.
- After the abolition of slavery in the British Empire in 1833, this port was used to ship lakhs of Indians as 'indentured labourers' to far-flung territories throughout the Empire.
- As Kolkata grew in size and importance, merchants in the city demanded the setting up of a port trust in 1863.
- The colonial government formed a **River Trust in 1866**, but it soon failed, and administration was again taken up by the government.
- Finally, in 1870, the **Calcutta Port Act (Act V of 1870)** was passed, creating the offices of Calcutta Port Commissioners.
- In 1869 and 1870, eight jetties were built on the Strand. A wet dock was set up at Khidirpur in 1892. The Khidirpur Dock II was completed in 1902.
- As cargo traffic at the port grew, so did the requirement of more kerosene, leading to the building of a petroleum wharf at Budge Budge in 1896.
- In 1925, the Garden Reach jetty was added to accommodate greater cargo traffic. A new dock, named King George's Dock, was commissioned in 1928 (it was renamed Netaji Subhash Dock in 1973).
- During World War II, the port was bombed by Japanese forces.

- After Independence, the Kolkata Port lost its preeminent position in cargo traffic to ports at Mumbai, Kandla, Chennai, and Visakhapatnam.
- In 1975, the Commissioners of the port ceased to control it after the Major Port Trusts Act, 1963, came into force.

### Who was Dr. Shyama Prasad Mookerjee?

- Dr. Shyama Prasad Mookerjee was born in Calcutta on 6<sup>th</sup> July, 1901. He was the youngest (33) ever Vice-Chancellor of Calcutta University and Independent India's first Minister of Industry and Supply.
- After India's independence, Prime Minister Jawaharlal Nehru made Dr. Shyama Prasad Mookerjee Ministry for Industry and Supply in the interim Central Government.
- However he resigned from the Cabinet in 1950 as he was against the 'Nehru-Liaquat Ali Pact'.
- After he formed Bhartiya Jana Sangh on 21<sup>st</sup> October, 1951 and became its first President

The Bhartiya Jana Sangh (BJS) or Akhil Bharatiya Jana Sangh was an Indian right wing political party that existed from 1951 to 1977. The BJS was ideologically close to the Rashtriya Swayamsevak Sangh, and derived most of its political activist base and candidates from the RSS ranks. It was succeeded by the Bharatiya Janata Party.

## A GIANT FISH IS DECLARED EXTINCT

### ◎ CONTEXT

- **One of the largest freshwater fish has been declared extinct in a study published in the journal Science of the Total Environment.**

### ◎ ABOUT

- The Chinese paddlefish (*Psephurus gladius*) was an iconic species, measuring up to 7 m in length, dating back from 200 million years ago, and therefore swimming the rivers when dinosaurs ruled the Earth.
- Its ancestral home was the Yangtze River.
- Chinese researchers made this conclusion based on the Red List criteria of the International Union for Conservation of Nature (IUCN).

### The Red List has several categories for extinction

- **"Extinct in the wild"** means a species survives only in a captive environment
- **"Locally extinct"** means a species has ceased to exist in a particular area but may exist in other areas.
- **"Functionally extinct"**, which means the species continues to exist but it has too few members to enable to reproduce meaningfully enough to ensure survival.
- **"Globally extinct"**, it means a species has no surviving member anywhere. Such a conclusion is reached when there is no reasonable doubt left that its last member has died.

### Other facts

- Declaring a species extinct is an elaborate process. It involves a series of exhaustive surveys, which need to be taken at appropriate times, throughout the species' historic range and over a time-frame that is appropriate to the species' life cycle and form.
- Once declared extinct, a species is not eligible for protective measures and conservation funding; therefore, the declaration has significant consequences.
- In the case of the Chinese paddlefish, the researchers made the conclusion over long-term surveys. It was once common in the Yangtze, before overfishing and habitat



fragmentation — including dam building — caused its population to dwindle from the 1970s onwards.

- Between 1981 and 2003, there were just around 210 sightings of the fish.
- The researchers estimate that it became functionally extinct by 1993, and extinct sometime between 2005-2010

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## GREEN CREDIT SCHEME

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### © CONTEXT

- **The Forest Advisory Committee has approved the ‘Green Credit Scheme’ that could allow “forests” to be traded as a commodity. If implemented, it allows the Forest Department to outsource one of its responsibilities of reforesting to non-government agencies.**

#### What is the ‘Green Credit Scheme’?

- The proposed ‘Green Credit Scheme’, as it is called, allows agencies, they could be private companies, village forest communities, to identify land and begin growing plantations.
- After three years, they would be eligible to be considered as compensatory forest land if they met the Forest Department’s criteria.
- An industry needing forest land could then approach the agency and pay it for parcels of such forested land, and this would then be transferred to the Forest Department and be recorded as forest land.
- The participating agency will be free to trade its asset, that is a plantation, in parcels, with project proponents who need forest land.
- Once finalised, the scheme will overhaul the compensatory afforestation process by accrediting private or public-private partnership companies to raise plantations near reserved forests which can be bought in lieu of projects involving forest diversion.
- If the company raising the plantation doesn’t wish to trade it, it can retain it and harvest the timber once ready.

#### Understanding the current system:

- Under the Forest Conservation Act 1980, each time forest land is diverted for non-forest purposes like mining or industry, the project developer is supposed to identify land and pay for planting forests over an equal area of non-forest land, or when that is not available, twice the area of degraded forest land.
- It also must pay the State Forest Department the current economic equivalent, called **Net Present Value**, of the forest land.
- This money currently gets collected under the **Compensatory Afforestation Fund**.
- It’s then the Forest Department’s responsibility to grow appropriate vegetation that, over time, would grow into forests.
- Industries have often complained that they find it hard to acquire appropriate non-forest land, which has to be contiguous to an existing forest.
- Nearly ₹50,000 crores had been collected by the Centre over decades, but the funds were lying unspent because States were not spending the money on regrowing forests.
- The Supreme Court intervened, a new law came about with rules for how this fund was to be administered.
- About ₹47,000 crores had been disbursed to States until August, but it has barely led to any rejuvenation of forests.

**Concerns:**

The proposed scheme has raised some concerns among green activists, as given below:

- **The threat to agricultural land:** The money involved will be discussed between the private agencies raising these plantations and the project proponent. If the economic value of these plantations becomes lucrative, it can pose a serious threat to agricultural land, by diverting the latter for plantations.
- **Uncontrolled circulation of money:** In the scheme, the Compensatory afforestation (CA) money can be exchanged between the private agency and the project proponent. It can lead to a situation where money keeps circulating within a private company.
- **Issues of ambiguity:** The scheme does not provide details about the ownership over the land and where the land will be sourced from.
- **Destruction:** Concerns are also being raised that this would lead to the privatisation of forests and give impetus to their destruction.

**Significance of the Scheme:**

- **Proper monitoring:** There would be monitoring of plantations, which wasn't done earlier and make it easy for individuals to plant and harvest trees, which earlier was difficult due to the provisions of the Forest (Conservation) Act, 1980.
- **Encouraging plantation:** The scheme will encourage plantation by individuals outside the traditional forest area.
- **Meeting environmental goals:** Furthermore, it will help in meeting international commitments such as sustainable development goals and nationally determined contributions.

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## DIEGO- THE GIANT TORTOISE

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**◎ CONTEXT**

- Recently, Diego (*Chelonoidis hoodensis*, or the giant tortoise species) has retired from the captive breeding programme in the Galapagos National Park, Ecuador. He will be returned to Española Island, from where he was taken around 80 years ago.

**◎ ABOUT**

- Diego is 100 years old and joined the breeding programme in 1976.
- The tortoise population has since gone up from 15 to 2,000.
- He is responsible for about 40% of the offspring produced.
- Another male tortoise 'E5' has generated about 60% offspring.
- Diego has a long leathery neck, dull-yellow face and beady eyes. Fully stretched out, he extends to about five feet and weighs about 176 pounds.
- The long neck is critical for his species' survival, helping the tortoises crane their necks to feed on cacti.
- IUCN Red List Status: Critically Endangered

**Threats:**

- Tortoises on the Galápagos Islands served as an excellent source of food for seafarers in the 1800s so a large number were picked up from the islands.

**Galápagos National Park**

- It was created in 1959 and it was the first national park of Ecuador.
- The Galápagos Islands were designated as a UNESCO World Heritage Site in 1978.

- Feral goats on the islands posed another danger, competing for food, destroying the tortoises' habitat.

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## 'HIGHEST NUMBER OF WETLAND SPECIES IN KAZIRANGA'

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### ◎ CONTEXT

- Kaziranga recorded 96 species of wetland birds — one of the highest for wildlife reserves in India, according to the second wetland bird count conducted recently.

#### Key-highlights of the Survey:

- The survey registered a total of 19,225 birds belonging to 96 species under 80 families. It covered four ranges of the park:
  - Agoratoli
  - Bagori
  - Kohora
  - Burapahar
- More than half the birds (9,924) and 85 of the 96 species were recorded in **Agoratoli Range**. This was because **Sohola**, the largest of Kaziranga's 92 perennial wetlands, is in this range.
- With 6,181 individuals, the **bar-headed goose** led the species count, followed by the common **teal** at 1,557 and **northern pintail** at 1,359. All three belong to the family **Anatidae**.
- The other species with sizeable numbers include **gadwall, common coot, lesser whistling duck, Indian spot-billed duck, little cormorant, ferruginous duck, tufted duck, Eurasian wigeon, Asian openbill, northern lapwing, ruddy shelduck** and **spot-billed pelican**.

### ◎ BACKGROUND

- The first wetland bird survey in Kaziranga, a UNESCO World Heritage Site since 1985, was conducted in 2018.
- The first waterfowl census in 2018 had yielded 10,412 birds covering 80 species, belonging to 21 families.

#### What are the Wetlands?

- Wetlands are areas where water covers the soil or is present either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season.
- The primary factor that distinguishes wetlands from other landforms or water bodies is the characteristic vegetation of aquatic plants, adapted to the unique hydric soil.
- Wetlands play a number of ecological functions, such as water purification, water storage, processing of carbon and other nutrients, stabilization of shorelines, and support of plants and animals.

#### Ramsar Convention on Wetlands:

- The Convention on Wetlands, called the Ramsar Convention, is the intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources.
- It is the only global treaty that focuses specifically on wetlands.
- The Convention was adopted in the Iranian city of Ramsar in 1971 and came into force in 1975.
- At present, there are 27 Ramsar Wetlands Sites in India:

S.No.	Name of Sites	State	S.No.	Name of Sites	State
1.	Asthamudi Wetland	Kerala	2.	Bhoj Wetlands	Madhya Pradesh
3.	Bhitarkanika Mangroves	Orissa	4.	Chandertal Wetland	Himachal Pradesh
5.	Chilka Lake	Orissa	6.	Deepor Beel	Assam
7.	East Calcutta Wetlands	West Bengal	8.	Hokera Wetland	Jammu and Kashmir
9.	Harike Lake	Punjab	10.	Kanjli Lake	Punjab
11.	Keoladeo Ghana NP	Rajasthan	12.	Kolleru Lake	Andhra Pradesh
13.	Loktak Lake	Manipur	14.	Nalsarovar Bird Sanctuary	Gujarat
15.	Point Calimere	Tamil Nadu	16.	Pong Dam Lake	Himachal Pradesh
17.	Renuka Wetland	Himachal Pradesh	18.	Ropar Lake	Punjab
19.	Rudrasagar Lake	Tripura	20.	Sambhar Lake	Rajasthan
21.	Sasthamkotta Lake	Kerala	22.	Surinsar-Mansar Lakes	Jammu and Kashmir
23.	Tsomoriri Lake	Jammu and Kashmir	24.	Vembanad Kol Wetland	Kerala
25.	Wular Lake	Jammu & Kashmir	26.	Sunderbans Wetland	West Bengal
27.	Upper Ganga River (Brijghat to Narora Stretch)	Uttar Pradesh			

### Quick facts on Kaziranga National Park:

- **Important species:** Kaziranga National Park a world heritage site is famous for the Great Indian one-horned rhinoceros. Besides rhinoceros, it is inhabited by tigers, elephants, panthers and bears, and thousands of birds.
- **Location:** It is located fairly in the Golaghat and Nagaon regions of Assam in India and also placed beside the Brahmaputra River on the North and the Karbi Anglong mounts on South India. Kaziranga National Park is the abode of 37 highways which is passed through the park.
- It has been declared as National Park in 1974. It has been **declared as a world heritage site by UNESCO.**
- **Legal protection:** The property receives the highest legal protection and strong legislative framework under the provisions of the Indian Wildlife (Protection) Act, 1972 and Indian Forest Act, 1927/Assam Forest Regulation 1891.

## HOW SWAMI VIVEKANANDA BECAME THE 'MESSENGER OF INDIAN WISDOM' TO WEST

### ◎ CONTEXT

- January 12 is the birth anniversary of Swami Vivekananda, the famous Hindu spiritual leader and intellectual from the late 19th century.

### ◎ ABOUT

- An important religious reformer in India, Swami Vivekananda is known to have introduced the Hindu philosophies of Yoga and Vedanta to the West.

- Netaji Subhas Chandra Bose had called Vivekananda the “maker of modern India.”
- In his honour, the government of India in 1984 declared his birthday as National Youth Day.
- The aim of the celebrations is to spread the message of strength, fearlessness, sacrifice, character-building and excellence among youth.
- Swami Vivekananda propounded the importance of Education in building a nation. He believed that education was the primary means to empowering people. He specially emphasized on education being relevant to the common masses.
- Ramakrishna Mission is an organization established by Swami Vivekananda which works in the area of value based education, culture, health, women’s empowerment, youth and tribal welfare and relief and rehabilitation.

### Swami Vivekananda early life

- Vivekananda was born in Kolkata on January 12, 1863, as Narendra Nath Datta.
- From an early age, he nurtured an interest in Western philosophy, history, and theology, and went on to meet the religious leader Ramakrishna Paramhansa, who later became his Guru. He remained devoted to Ramakrishna until the latter’s death in 1886.
- In 1893, he took the name ‘Vivekananda’ after Maharaja Ajit Singh of the Khetri State requested him to do so, changing from ‘Sachidananda’ that he used before.
- After Ramakrishna’s death, Vivekananda toured across India, and set after educating the masses about ways to improve their economic condition as well as imparting spiritual knowledge.

### The Chicago address

- Vivekananda is especially remembered around the world for his speech at the Parliament of the World’s Religions in Chicago in 1893.
- The speech covered topics including universal acceptance, tolerance and religion.
- He began delivering lectures at various places in the US and UK, and became popular as the ‘messenger of Indian wisdom to the Western world’.

### Vivekananda’s legacy

- Through his speeches and lectures, Vivekananda worked to disseminate his religious thought. He preached ‘neo-Vedanta’, an interpretation of Hinduism through a Western lens, and believed in combining spirituality with material progress.
- ‘Raja Yoga’, ‘Jnana Yoga’, ‘Karma Yoga’ are some of the books he wrote.
- Before his death in 1902, Vivekananda wrote to a Western follower: “It may be that I shall find it good to get outside my body, to cast it off like a worn out garment. But I shall not cease to work. I shall inspire men everywhere until the whole world shall know that it is one with God.”

### 10 Inspirational Quotes by the Legendary and World Renowned Monk Swami Vivekananda

- All the powers in the universe are already ours. It is we who have put our hands before our eyes and cry that it is dark.
- We are what our thoughts have made us; so take care about what you think. Words are secondary. Thoughts live; they travel far.
- Take up one idea. Make that one idea your life -think of it, dream of it, live on that idea. Let the brain, muscles, nerves, every part of your body, be full of that idea and just leave every other idea alone. This is the way to success.
- All differences in this world are of degree, and not of kind, because oneness is the secret of everything.
- If money help a man to do good to others, it is of some value; but if not, it is simply a mass of evil, and the sooner it is got rid of, the better.

- You have to grow from the inside out. None can teach you, none can make you spiritual. There is no other teacher but your own soul.
- The moment I have realized God sitting in the temple of every human body, the moment I stand in reverence before every human being and see God in him - that moment I am free from bondage, everything that binds vanishes, and I am free.
- Truth can be stated in a thousand different ways, yet each one can be true.
- As different streams having different sources all mingle their waters in the sea, so different tendencies, various though they appear, crooked or straight, all lead to God.
- When an idea exclusively occupies the mind, it is transformed into an actual physical or mental state.

## JUS COGENS

### ◎ CONTEXT

- Recently, the term JUS COGENS was used by Iranian foreign minister in response to the President Trump's threat to attack Iran's cultural sites.

### ◎ ABOUT

- Legally, JUS COGENS means a principle of international law that is based on values taken to be fundamental to the international community and that cannot be set aside.
- The US has threatened to target few historical sites if Iran retaliates to attack US in revenge AS US forces killed Iranian top commander Solamani in a drone attack. This is a breach of JUS COGENS as targeting cultural sites amounts to war crime.
- The jus cogens rules have been sanctioned by the Vienna Conventions on the Law of Treaties of 1969 and 1986. According to both Conventions, a treaty is void if it breaches jus cogens rules.
- Jus Cogens or ius cogens, meaning "compelling law" in Latin, are rules in international law that are peremptory or authoritative, and from which states cannot deviate.
- These norms cannot be offset by a separate treaty between parties intending to do so, since they hold fundamental values.
- Today, most states and international organisations accept the principle of jus cogens, which dates back to Roman times.

### Vienna Convention and JUS COGENS

- Article 53 of the 1969 Convention says: "A treaty is void if, at the time of its conclusion, it conflicts with a peremptory norm of general international law.
- For the purposes of the present Convention, a peremptory norm of general international law is a norm accepted and recognized by the international community of States as a whole as a norm.
- From this no derogation is permitted and which can be modified only by a subsequent norm of general international law having the same character.
- Article 64 says- If a new peremptory norm of general international law emerges, any existing treaty which is in conflict with that norm becomes void and terminates.
- Besides treaties, unilateral declarations also have to abide by these norms.

### What is included in JUS COGENS?

- So far, an exhaustive list of jus cogens rules does not exist.
- However, the prohibition of slavery, genocide, racial discrimination, torture, and the right to self-determination are recognised norms.
- The prohibition against apartheid is also recognised as a jus cogens rule, from which no derogation is allowed, since apartheid is against the basic principles of the UN.

### What is the problem with targeting cultural heritage?

- Following the unparalleled destruction of cultural heritage in World War II, the nations of the world adopted at The Hague in 1954, The Convention for the Protection of Cultural Property in the Event of Armed Conflict.
- It was the first international treaty focussed exclusively on the protection of cultural heritage during war and armed conflict.
- The Convention defined cultural property as "movable or immovable property of great importance to the cultural heritage of every people, such as monuments of architecture, art or history, whether religious or secular; archaeological sites....", etc.
- There are currently 133 signatories to Convention, including countries that have acceded to and ratified the treaty.
- Both the United States and Iran (as well as India) signed the Convention on May 14, 1954, and it entered into force on August 7, 1956.
- The Rome Statute of 1998, the founding treaty of the International Criminal Court, describes as a "war crime" any intentional attack against a historical monument, or a building dedicated to religion, education, art, or science.

### ◎ CONCLUSION

- Both warring countries must de-escalate and respect the international laws. India must play a role of mediation to find peace between the warring Iran and US.

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## 'NEPAL'S SEKE 'NEAR-EXTINCT''

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### ◎ CONTEXT

- Recently, The New York Times reported that the "near-extinct" Nepalese language Seke has just 700 speakers around the world.

#### Nepal's Seke language:

- According to the Endangered Language Alliance (ELA), Seke is one of the over 100 indigenous languages of Nepal and is mainly spoken in the five villages of **Chuksang, Chaile, Gyakar, Tangbe** and **Tetang** in the Upper Mustang district.
- The dialects from these villages differ substantially and are believed to have varying degrees of mutual intelligibility.
- In recent years, Seke has been retreating in the face of Nepali, which is **Nepal's official language** and is considered to be crucial for getting educational and employment opportunities outside villages.

#### Why language is becoming vulnerable?

- Out of the 700 speakers, 100 are in New York, and roughly half of these 100 stay in one building in the city.
- Most of the Seke-speaking community in New York stays in the Ditmas Park area of Brooklyn, or in Queens.
- According to ELA, difficult conditions at home and job prospects elsewhere have brought speakers of Seke to places such as Pokhara, Kathmandu and even New York.
- Therefore, the vulnerability of the language is linked to the migration of people to places where Seke is not spoken, which has reduced the intergenerational transmission of the language.
- Furthermore, the younger generation does not find much use in learning the language, giving preference to Nepali and English.

#### Disappearing indigenous language:

- The last year, 2019, was the International Year of Indigenous Languages, mandated by the United Nations (UN).

- In December 2019, the United Nations General Assembly stated that despite efforts throughout the year, one indigenous language disappears every fortnight.
- Of 7,000 indigenous languages spoken today, four in 10 are in danger of disappearing.

### Which languages are in danger?

- UNESCO has six degrees of endangerment. These are:
  - **Safe**, which are the languages spoken by all generations and their intergenerational transmission is uninterrupted
  - **Vulnerable languages**, which are spoken by most children but may be restricted to certain domains
  - **Definitely endangered languages**, which are no longer being learnt by children as their mother tongue.
  - **Severely endangered** are languages spoken by grandparents and older generations, and while the parent generation may understand it, they may not speak it with the children or among themselves.
  - **Critically endangered languages** are those of which the youngest speakers are the grandparents or older family members who may speak the language partially or infrequently
  - **Extinct languages**, of which no speakers are left.
- Considering these definitions, Seke may be considered to be a **definitely endangered language**.
- As per UNESCO, roughly 57 percent of the world's estimated 6,000 languages are safe, about 10 percent are vulnerable, 10.7 percent are definitely endangered, about 9 percent are severely endangered, 9.6 percent are critically endangered and about 3.8 per cent of all languages are extinct since 1950.
- As per the Endangered Languages Project (ELP), there are roughly **201 endangered languages in India** and about 70 in Nepal.

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## HOW IS A LANGUAGE DECLARED 'CLASSICAL' IN INDIA, WHAT BENEFITS IT ENJOYS

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### ◎ CONTEXT

- The Akhil Bharatiya Marathi Sahitya Sammelan recently demanded that Marathi be given the status of a 'classical language'.

### ◎ ABOUT

- At the recently concluded 93rd edition of the Akhil Bharatiya Marathi Sahitya Sammelan, a resolution was passed demanding the declaration of Marathi as a 'Classical' language.
- The Sammelan, an annual conference of Marathi writers, was started in 1878, and over the years has been headed by leading Marathi intellectuals, including Justice Mahadev Govind Ranade, Maharaja Sayajirao Gaekwad III of Baroda, and Prahlad Keshav "Acharya" Atre.
- This year's conference was presided over by litterateur, environmentalist, and Catholic priest Francis D'Britto, the first Christian to do so in history.

### What are 'Classical' languages in India, and how are they classified?

- Currently, six languages enjoy the 'Classical' status: Tamil (declared in 2004), Sanskrit (2005), Kannada (2008), Telugu (2008), Malayalam (2013), and Odia (2014).
- Guidelines for declaring a language as 'Classical' are
  - High antiquity of its early texts/recorded history over a period of 1500-2000 years;



- A body of ancient literature/texts, which is considered a valuable heritage by generations of speakers;
- The literary tradition be original and not borrowed from another speech community
- The classical language and literature being distinct from modern, there may also be a discontinuity between the classical language and its later forms or its offshoots.

### How are the Classical languages promoted?

- Two major annual international awards for scholars of eminence in classical Indian languages
- A Centre of Excellence for studies in Classical Languages is set up
- The University Grants Commission is requested to create, to start with at least in the Central Universities, a certain number of Professional Chairs for the Classical Languages so declared.
- Ministry of Culture listed the institutions that have been dedicated to Classical languages.
- Sanskrit: Rashtriya Sanskrit Sansthan, New Delhi; Maharishi Sandipani Rashtriya Ved Vidya Pratishthan, Ujjain; Rashtriya Sanskrit Vidyapeetha, Tirupati; and Sri Lal Bahadur Shastri Rashtriya Sanskrit Vidyapeeth, New Delhi
- Telugu and Kannada: Centres of Excellence for Studies in the respective languages at the Central Institute of Indian Languages (CIIL) established by the HRD Ministry.
- Tamil: Central Institute of Classical Tamil (CICT), Chennai.

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## PRIVATE PROPERTY IS A HUMAN RIGHT: SC

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### ◎ CONTEXT

- In a recent judgement, the Supreme Court held that “a citizen’s right to own private property is a human right” and the state cannot take possession of it without following due procedure and authority of law.

### About Human Rights:

- Human rights are based on dignity, equality and mutual respect – regardless of nationality, religion or beliefs.
- Simply put, Human Rights are those minimal rights which every individual must have against the State or other public authority by virtue of his being a ‘member of the human family’, irrespective of any other consideration.
- These basic human rights are:
  - **Universal:** They belong to all (everybody in the world)
  - **Inalienable:** They cannot be taken away from the people
  - **Indivisible and interdependent:** Governments should not be able to pick and choose which are respected.
  - **Human Rights can be violated:** Although they are inalienable, they are not invulnerable. Violations can stop people from enjoying their rights, but they do not stop the rights from existing.
- **Essential:** They are essential for freedom, justice, and peace.

**Universal Declaration of Human Rights (UDHR):** UDHR was the first international agreement which outlined the rights and freedoms everyone is entitled to. It is a historic document on the basic principles of human rights that laid the foundation for human rights protections. India is a signatory to the UDHR.

### What did the Court say?

- A bench of Justices Indu Malhotra and Ajay Rastogi in its verdict said the state, being a welfare state governed by the rule of law cannot arrogate to itself a status beyond what is provided by the Constitution.
- The bench referred to an earlier verdict to say it has been held that the **right to property** is now considered to be not only a **constitutional or statutory right** but also a **human right**.
- The top court ruled that to forcibly dispossess citizens of their private property, without following the due process of law, would be to violate a human right, as also the constitutional right under **Article 300A** of the Constitution.
- The state being a welfare state cannot be permitted to take the plea of adverse possession, which allows a trespasser i.e. a person guilty of a tort, or even a crime, to gain legal title over such property for over 12 years.
- The state cannot be permitted to perfect its title over the land by invoking the doctrine of adverse possession "to grab the property of its own citizens, as has been done in the present case".
- The state cannot dispossess a citizen of his property except in accordance with the procedure established by law.

**Right to Property:** Property ceased to be a fundamental right with the **44th Constitution Amendment in 1978**. Nevertheless, Article 300A required the state to follow due procedure and authority of law to deprive a person of his or her private property. Article 300-A of the Constitution of India reads as under:

**"Persons not to be deprived of property save by authority of law.** No person shall be deprived of his property save by authority of law."

Thus, right to property is a constitutional right as well as human right, though right to property is no longer a fundamental right and constitutional protection continues in as much as without authority of law, a person cannot be deprived of his property.

### The case:

- The state government of Himachal Pradesh had acquired the land in 1967-68 for construction of road between Nadaun-Sujanpur Road in Hamir Pur district without following the acquisition proceedings.
- The state government deprived the appellant (an illiterate persona and a widow from a rural area) of her private property without resorting to the procedure prescribed by law.
- The Appellant has been divested of her right to property without being paid any compensation whatsoever for over half a century.
- The SC exercised its extraordinary jurisdiction, under **Articles 136** and **142** of the Constitution, and directed the state to pay the compensation to the woman in eight weeks with all statutory benefits.

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## GOLDBLOCKS ZONE

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### ◎ CONTEXT

- NASA has reported the discovery of an Earth-size planet, named TOI 700 d, orbiting its star in the “goldilocks zone”.

### ◎ ABOUT

- It is a **habitable zone around a star where it is not too hot and not too cold for liquid water to exist on the surface of surrounding planets.**
- Our **Earth is in the Sun’s Goldilocks zone**, if Earth were the dwarf planet like Pluto is, all its water would freeze and if Earth were where Mercury is, all its water would boil off.
- Life on Earth started in water, and water is a necessary ingredient for life. When scientists search for the possibility of alien life, any rocky exo-planet in the habitable zone of its star is an exciting find.
- The newest such planet was found by NASA’s Transiting Exoplanet Survey Satellite (TESS) mission, which it launched in 2018.
- Very few such Earth-size planets have been found so far, including some by NASA’s Kepler mission, and this one is the first such discovery by TESS.
- The find was confirmed by the Spitzer Space Telescope, which sharpened the measurements that TESS had made, such as orbital period and size.

#### **New discovered planet**

- TOI 700 d measures 20% larger than Earth. It orbits its star once every 37 days and receives an amount of energy that is equivalent to 86% of the energy that the Sun provides to Earth.
- The star, TOI 700, is an “M dwarf” located just over 100 light-years away in the southern constellation Dorado, is roughly 40% of our Sun’s mass and size, and has about half its surface temperature.
- TOI 700 d is the outermost planet, and the only one in the star’s habitable zone.

#### **Transiting Exoplanet Survey Satellite (TESS) mission:**

- The Transiting Exoplanet Survey Satellite (TESS) is a space telescope for NASA’s Explorers program, designed to search for exoplanets using the transit method in an area 400 times larger than that covered by the Kepler mission.
- TESS launched on April 18, 2018, on a SpaceX Falcon 9 rocket.

### ◎ CONCLUSION

- NASA’s planet-hunter satellite TESS has discovered an Earth-sized planet named TOI 700 d within the habitable range of its star, which could allow the presence of liquid water which is a great discovery as there has a great hunt for the discovery of water on other planets.

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## H9N2

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### ◎ CONTEXT

- Indian scientists have detected the country’s first case of infection with a rare variant of the virus that causes avian influenza, or bird flu.

#### **What is H9N2?**

- H9N2 is a subtype of the influenza A virus, which causes human influenza as well as bird flu.
- The H9N2 subtype was isolated for the first time in Wisconsin, the US in 1966 from turkey flocks. According to the US National Centre for Biotechnology Information

(NCBI), H9N2 viruses are found worldwide in wild birds and are endemic in poultry in many areas.

- However, they are somewhat neglected.
- H9N2 viruses could potentially play a major role in the emergence of the next influenza pandemic.
- According to the World Health Organization (WHO), with avian influenza viruses circulating in poultry, there is a risk for sporadic infection and small clusters of human cases due to exposure to infected poultry or contaminated environments.
- Therefore, sporadic human cases are not unexpected.

Influenza A viruses are the only influenza viruses known to cause flu pandemics, i.e., global epidemics of flu disease. A pandemic can occur when a new and very different influenza A virus emerges that both infects people and has the ability to spread efficiently between people.

### How it has infected humans?

- H9N2 virus infections in humans are rare, but likely under-reported due to typically mild symptoms of the infections.
- Cases of human infection have been observed in Hong Kong, China, Bangladesh, Pakistan, and Egypt. One case was detected in Oman recently.
- The first case globally was reported from Hong Kong in 1998.
- A total of 28 cases in China have been reported since December 2015. Cases continue to be reported mainly from mainland China and Hong Kong.
- The virus has, however, spread extensively among poultry populations. Surveillance for influenza viruses in poultry in Bangladesh during 2008-2011 found H9N2 virus to be the predominant subtype.
- The virus was also identified in poultry populations in surveillance studies in Myanmar during 2014-16 and Burkina Faso in 2017.
- In India, the virus was picked up in February 2019 during a community-based surveillance study in 93 villages of Korku tribes in Melghat district of Maharashtra.

### Understanding Influenza:

- The World Health Organization (WHO) defines influenza as “a contagious, acute respiratory illness caused by influenza viruses, usually influenza A or B subtypes.”
- Influenza, also known as the flu, is a viral respiratory illness that can spread when a person with the infection sneezes or coughs and droplets travel to another person’s nose or mouth.
- The influenza virus, which causes the illness, is of four types: A, B, C, and D.
  - **Influenza A:** An influenza A virus has two surface proteins:
    - ▶ Hemagglutinin (H)
    - ▶ Neuraminidase (N)
  - **Influenza B:** Influenza B viruses can also cause seasonal epidemics that typically only affect humans. There are two lineages of influenza B:
    - ▶ Victoria
    - ▶ Yamagata
- **Influenza C:** Influenza C viruses cause mild illnesses — they do not appear to cause epidemics.
- **Influenza D:** Influenza D viruses mainly affect cattle and do not seem to infect humans.

## NASA'S ARTEMIS MISSION, AND THE INDIAN AMERICAN IN ITS NEW ASTRONAUT COHORT

### ◎ CONTEXT

- Indian American Raja Chari is among 11 new astronauts who joined NASA's ranks on Friday (January 10), taking the strength of the active astronauts corps in the United States space agency to 48.

### ◎ ABOUT

- This cohort of new astronauts may be assigned to space missions to the International Space Station (ISS), the Moon and ultimately, Mars.
- The agency has targeted the human exploration of Mars by the 2030s.
- Raja Chari was selected by NASA to join the 2017 Astronaut Candidate Class.

### Artemis Program

- NASA wants to send the first woman and the next man to the Moon by the year 2024, which it plans on doing through the Artemis lunar exploration program.
- With the Artemis program, NASA wishes to demonstrate new technologies, capabilities and business approaches that will ultimately be needed for the future exploration of Mars.
- For the Artemis program, NASA's new rocket called the Space Launch System (SLS) will send astronauts aboard the Orion spacecraft a quarter of a million miles away from Earth to the lunar orbit.
- Once astronauts dock Orion at the Gateway — which is a small spaceship in orbit around the moon — the astronauts will be able to live and work around the Moon, and from the spaceship, astronauts will take expeditions to the surface of the Moon.
- The astronauts going for the Artemis program will wear newly designed spacesuits, called Exploration Extravehicular Mobility Unit, or xEMU.
- These spacesuits feature advanced mobility and communications and interchangeable parts that can be configured for spacewalks in microgravity or on a planetary surface.

### NASA and the Moon

- The US began trying to put people in space as early as in 1961.
- Eight years later, on July 20, 1969, Neil Armstrong became the first human to step on the Moon as part of the Apollo 11 mission.

### Moon exploration

- In 1959, the Soviet Union's uncrewed Luna 1 and 2 became the first rover to visit the Moon. Since then, seven nations have followed suit.
- Before the US sent the Apollo 11 mission to the Moon, it sent three classes of robotic missions between 1961 and 1968.
- Then in the 1990s, the US resumed lunar exploration with robotic missions Clementine and Lunar Prospector.
- In 2009, it began a new series of robotic lunar missions with the launch of the Lunar Reconnaissance Orbiter (LRO) and the Lunar Crater Observation and Sensing Satellite (LCROSS).
- In 2011, NASA began the ARTEMIS (Acceleration, Reconnection, Turbulence, and Electrodynamics of the Moon's Interaction with the Sun) mission using a pair of repurposed spacecraft and in 2012 the Gravity Recovery and Interior Laboratory (GRAIL) spacecraft studied the Moon's gravity.
- Apart from the US, the European Space Agency, Japan, China, and India have sent missions to explore the Moon.

- China landed two rovers on the surface, which includes the first-ever landing on the Moon's far side in 2019.
- The Indian Space Research Organisation (ISRO) recently announced India's third lunar mission Chandrayaan-3, which will comprise a lander and a rover.

## NEON: THE VIRTUAL HUMAN

### ◎ CONTEXT

- **The Virtual Human NEON was one of the most-discussed new concepts at the annual Consumer Electronics Show (CES) held in Las Vegas in 2020.**

### ◎ ABOUT

- NEONs, being called the world's first artificial humans, have been created by Samsung's Star Labs headed by Pranav Mistry, an India - born scientist.
- NEONs are computationally created virtual humans — the word derives from **NEO (new) + humanN.**
- For now the virtual humans can show emotions when manually controlled by their creators. But the idea is for NEONs to become intelligent enough to be fully autonomous, showing emotions, learning skills, creating memories, and being intelligent on their own.
- A virtual human is a Computer Generated (CG) human simulation with artificial intelligence. A virtual human can have a CG human body, and CG voice and computer empowered senses. Virtual humans can be applied in various domains such as education, marketing, branding, training & sales.
- Star Labs started work on NEONs by trying to replicate a friend. Initially, the models were trained on his face, and there were significant errors. But then, they started getting better, almost indistinguishable from the original.

### How does it work?

- There are two core technologies behind his virtual humans.
- First, there is the proprietary CORE R3 technology that drives the "reality, real time and responsiveness" behind NEONs.
- It is the front-end reality engine that is able to give you that real expression.
- The company claims CORE R3 "leapfrogs in the domains of Behavioral Neural Networks, Evolutionary Generative Intelligence and Computational Reality", and is "extensively trained" on how humans look, behave and interact.
- But in the end, it is like a rendition engine, converting the mathematical models to look like actual humans.
- The next stage will be SPECTRA, which will complement CORE R3 with the "spectrum of intelligence, learning, emotions and memory".
- But SPECTRA is still in development, and is not expected before NEONWORLD 2020 later this year.

### How could NEONs be used?

- NEONs are the interface for technologies and services.
- They could answer queries at a bank, welcome you at a restaurant, or read out the breaking news on television at an unearthly hour.
- This form of virtual assistance would be more effective, for example, while teaching languages, as NEONs will be capable of understanding and sympathizing.

### How are they different from Virtual Assistants?

- Virtual Assistants now learn from all the data they are plugged into. NEONs will be limited to what they know and learn.

- Their leaning could potentially be limited to the person they are catering to, and maybe her friends — but not the entire Internet.
- They will not be an interface for you to request a song, rather they will be a friend to speak to and share experiences with.
- Currently, its developer doesn't want NEONs to have collective memory, or to share data among themselves.

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## THE FIRST 3-D MODEL OF GLuD1 RECEPTOR

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### © CONTEXT

- **Researchers at the Department of Biotechnology's Pune-based National Centre for Cell Science (NCCS) have captured 'three-dimensional views' of a protein called 'GluD1 receptor'.**

#### What are GluD1 receptors?

- GluD1 receptor is a subtype of a family of proteins called **glutamate receptors**.
- Simply put, GluD1 is a protein that in humans is encoded by the GRID1 gene.
- Several studies have shown a strong association between several variants of the GRID1 gene and increased risk of developing schizophrenia.
- It is a postsynaptic organizer of inhibitory synapses in cortical pyramidal neurons.
- GluD1 is selectively required for the formation of inhibitory synapses and regulates GABAergic synaptic transmission accordingly.

#### On Glutamate:

- Glutamate is the most abundant neurotransmitter in our brain and central nervous system (CNS).
- It is involved in virtually every major excitatory brain function. Glutamate is also a metabolic precursor for another neurotransmitter called GABA (gamma-aminobutyric acid).
- ABA is the main inhibitory neurotransmitter in the central nervous system.
- **Glutamate receptors** play crucial roles in motor coordination and motor learning, high-frequency hearing and are also key to many other brain functions.
- Besides, they are linked to social and **cognitive deficits** and **neuronal disorders** like **Schizophrenia** and cocaine addiction.

Neurological disorders are diseases of the central and peripheral nervous system. In other words, the brain, spinal cord, cranial nerves, peripheral nerves, nerve roots, autonomic nervous system, neuromuscular junction, and muscles. These disorders include epilepsy, Alzheimer disease and other dementias, cerebrovascular diseases including stroke, migraine and other headache disorders, multiple sclerosis, Parkinson's disease, neuro infections, brain tumours, traumatic disorders of the nervous system.

#### What has been founded?

- The researchers found that GluD1 receptors had an unprecedented domain organisation, distinct from that observed in other members of the glutamate receptor family.
- This shows that glutamate receptor ion channels are all not built the same way.
- Majority (60 percent) of excitatory brain signalling is carried out by glutamate receptor ion channels that are present on the synaptic junctions of neurons.
- Interestingly, while many other members of the family of glutamate receptor are activated by neurotransmitter glutamate binding, GluD1 receptors are not.

- This is a new discovery and could provide deeper insights into the molecular underpinnings of receptor functions.

#### How they did it?

- The researchers had complexed the receptor with ligands that stabilised it to ensure that it was visualised well.
- This was critical as the inherent conformational variations limit the details that could be observed otherwise.
- They used the Cryo-EM technique that images several thousand molecules in a frozen state and combines the 2D images generated to build a three-dimensional view.

#### Significance of the discovery:

- **Understanding nervous system disorders:** This new discovery offers clues into the structural difference that might offer some unique insight into the mechanism behind a wide range of nervous system disorders and diseases.
- **A platform to discover treatments:** The study has created a robust platform for understanding the functions of GluD1 and developing therapeutics to treat neurological disorders that are associated with GluD1 dysfunction.

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