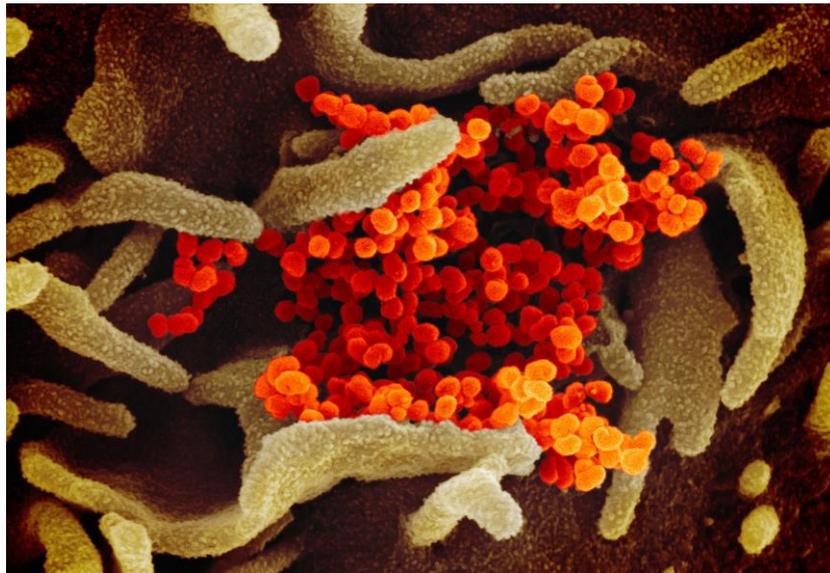


## **1. Structure of SARS-CoV-19 Key Protein Mapped**

### **Why in News?**

- Researchers at the University of Texas at Austin and the National Institutes of Health, U.S., have produced a 3D atomic scale map of the protein of the novel coronavirus (SARS-CoV-2) that binds to and infects human cells.



### **Highlights:**

- Mapping the 3D structure of the protein, spike (S) glycoprotein, will allow better understanding of how the virus binds to the human cells. Knowing the structure of the spike protein will, in turn, allow scientists to develop vaccines and antivirals against the virus and even better diagnostics.
- Like other coronaviruses, SARS-CoV-2 virus particles are spherical and have mushroom-shaped proteins called spikes protruding from their surface, giving the particles a crown-like appearance.
- The spike binds and fuses to human cells, allowing the virus to gain entry. The spike protein of the novel coronavirus shares 98% sequence identity with the spike protein of the bat coronavirus.
- The researchers also found that like in the case of the SARS coronavirus, the spike protein of the novel coronavirus (SARS-CoV-2) that causes COVID-19 disease binds to the cellular receptor called angiotensin-converting enzyme 2 (ACE2), which serves as the entry point into human cells.

- But unlike in the case of SARS, the spike protein of the novel coronavirus binds to the cell receptor with much higher affinity, 10- to 20-fold higher.
- The much greater binding affinity to the cell receptor explains the apparent high human-to-human transmissibility of the virus compared with the SARS coronavirus.
- The researchers tested three monoclonal antibodies specific to SARS virus for their ability to bind to the novel coronavirus.
- But none of the three antibodies tested were found to be effective in inhibiting the novel coronavirus from binding to the human receptor.
- Knowing the atomic-level structure of the 2019-nCoV spike will allow for additional protein engineering efforts that could improve antigenicity and protein expression for vaccine development.

## **2. Jalyukta Shivar Abhiyan**

### **Why in News?**

- Jalyukta Shivar, the flagship water conservation project launched by the earlier government has been officially scrapped by the present Maha government.

### **Jalyukta Shivar:**

- Launched in December 2014 after Maharashtra experienced consecutive droughts, the project aimed at rolling out measures that could potentially mitigate water scarcity in the most drought-prone villages in a systematic manner.
- Nearly 52 per cent of the state's geographical area is prone to drought, either naturally or due to poor rainfall.
- This includes Marathwada and adjoining areas of Madhya Maharashtra and large parts of Vidarbha.
- The project targeted strengthening and streamlining existing water resources like canals, bunds and ponds by arresting maximum run-off rainwater during monsoon.
- Tasks to widen and deepen natural water streams and connect them to nearby water storage facilities like earthen or concrete check-dams were proposed.
- In the first phase, planned during 2015 – 2019, Jalyukta Shivar envisaged making 5,000 villages drought-free, every year.



- During its proposed tenure, the government eyed at making 25,000 drought-prone villages water-sufficient.

#### **Significance:**

- While the exact number of villages that were declared drought-free remains unknown, the programme attempted to bring water stress down in a majority of the most water-scarce villages in the state.
- In January last year, then CM had announced that the scheme had transformed 16,000 drought-prone villages of Maharashtra.

#### **Water conservation in near future in the state:**

- Geologists and hydrologists, who worked on implementing the project, shared similar views and hailed Jalyukta Shivar.
- This was mainly due to the interventions undertaken in the existing water reserves, planned de-silting activities, among many others.
- However, experts agreed that the scheme was not appropriately implemented.
- Now with Jalyukta Shivar no longer in existence, focused efforts of the past five years, in most likelihood, will go down the drain unless a similar scheme is introduced.
- With rainfall variations getting more pronounced, in addition to depleting groundwater reserves, the state will need concrete interventions to tackle future water requirements

### **3. Monsoon in Sunderbans to get longer**

#### **Why in News?**

- The monsoon in Sunderbans is likely to last longer and get more intense, according to a fact sheet titled The Sunderbans and Climate Change, which was made public during the ongoing Convention on the Conservation of Migratory Species of Wild Animals.

#### **Highlights:**

- While the fact sheet puts the rise in the sea level at 3.2 mm per year currently, it states that an estimated rise of 28 cm above the sea levels registered in the year 2000 would result in a 96 % decline of the habitat of the Bengal tiger in Bangladesh.
- Climate specialists have predicted that as climate change progresses, monsoon seasons in the Sundarbans will become longer and more intense.
- Conversely, drought conditions will also become more pronounced, presenting further challenges for agricultural producers in particular and ecosystems in general.

- The document highlights the need for "long term coastal planning to ensure that these critically important intertidal habitats with their unique flora and fauna and local inhabitants have a space to retreat inland.
- The paper also points out that the habitat of the Bengal tiger (*Panthera tigris tigris*) in the Sunderbans is also affected by the storm due to a decline in the availability of prey. The fact sheet points out that the Sunderbans is also highly susceptible to flooding. Due to this, any swelling of ocean water is going to dramatically affect the area.
- Apart from the frequent storms and the rise of sea level, another concern is the rise of salinity both in water and soil.
- Excess levels of soil salinity can be incredibly damaging to ecosystems as salts can accumulate in the soil and hinder plant growth. It also threatens the health of freshwater aquatic life such as fish and giant prawns.

#### **Sundarbans:**

- The Sundarbans is a mangrove area in the delta formed by the confluence of Ganges, Brahmaputra and Meghna Rivers in the Bay of Bengal.
- It spans from the Hooghly River in India's state of West Bengal to the Baleswar River in Bangladesh.
- Four protected areas in the Sundarbans are enlisted as UNESCO World Heritage Sites, viz Sundarbans National Park, Sundarbans West, Sundarbans South and Sundarbans East Wildlife Sanctuaries.
- The forests, together with the Sundarbans mangroves, are important habitats for the Bengal tiger (*Panthera tigris tigris*).
- The forest also provides habitat for small wild cats such as the jungle cat (*Felis chaus*), fishing cat (*Prionailurus viverrinus*), and leopard cat (*P. bengalensis*).
- The Bangladeshi portion of Sundarbans was designated a Ramsar site on 21 May 1992, and the Indian portion on 30 January 2019.

#### 4. Craspedotropis Gretathunbergae

##### Why in News?

- Recently, a new land snail species was discovered in Brunei.

##### About Craspedotropis Gretathunbergae:

- It resides in tropical rainforests and is sensitive to drought and extreme temperatures which have become more frequent due to climate change.
- It is named after Swedish Climate Change activist Greta Thunberg as an honour.
- It is two-millimetre-long snails have dark grey tentacles, a pale body and a concave shell, whose outer part is greenish-brown.



#### 5. Disha Police Station

##### Context:

- The Chief Minister of Andhra Pradesh has recently launched Disha Police Station.

##### Key Points:

- It is first of its kind in the state, which is established under Disha act, 2019.
- Each police station will be headed by a **DSP rank officer**.
- It will deal with crimes covered under the Disha bill, including **IPC section 376**- rape and gang rape, **section 354**- assault or criminal force to woman with intent to outrage her modesty, 509 word, **gesture or act** intended to insult the modesty of a woman and the **POCSO Act**.
- A woman police officer is appointed as **nodal officer** to create awareness among the public about

##### About Disha Act, 2019:

- It prescribes **death penalty** under **Section 376 of IPC** (Indian Penal Code).
- It punishes crimes against children with 10 to 14 years of imprisonment.
- It mandates completion of the investigation into cases of sexual offences within **7 working days** from the time of record, and the trial must be concluded within **14 working days** from the date of filing the charge sheet.
- The appeal against the sentence passed under the new law has to be disposed of within six months.

- 30 per cent special allowance has been announced for the staff of Disha police stations, apart from an investigation expenditure of Rs 1 lakh per month.

## 6. Malai Mahadeshwara Wildlife Sanctuary

### Why in News?

- The Malai Mahadeshwara Wildlife Sanctuary will be declared as a tiger reserve.

### About Malai Mahadeshwara Wildlife Sanctuary:

- It is located in the Chamarajanagar district of Karnataka. It was declared as Wildlife Sanctuary in 2013.
- It will have **three tiger reserves**. It already has Bandipur and BRT Tiger Reserve within its territorial limits.
- It is contiguous to BRT Tiger Reserve, Sathya Mangalam Tiger Reserve and the Cauvery Wildlife Sanctuary.
- It consists mainly of **dry deciduous** type degrading to scrub forest in the fringe areas, and are interspersed with **moist deciduous, semi-evergreen, evergreen and shola forests** occurring at varying altitudes.
- It includes animals like tiger, elephant, leopard, wild dog, bison, sambar, spotted deer, barking deer, etc.

## 7. Pradhan Mantri Kisan Samman Nidhi (PMKSN)

### Why in News?

- Recently, the Centre has revised the **Pradhan Mantri Kisan Samman Nidhi (PMKSN)** scheme's beneficiary target down to 12 crores from 14 crores.

### About Pradhan Mantri Kisan Samman Nidhi:

- Under this programme, the vulnerable landholding farmer families, having cultivable land up to 2 hectares, will be provided direct income support at the rate of Rs. 6,000 per year.
- It will be transferred directly into the bank accounts of beneficiary farmers, in three equal instalments of Rs. 2,000 each.
- The complete expenditure of Rs 75000 crore for the scheme will borne by the Union Government in 2019-20.