



# PRECURE COMPILATION FOR 2020

**2<sup>nd</sup> week of April  
(13<sup>th</sup> April to 18<sup>th</sup> April)**

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## GEOGRAPHY

[https://youtu.be/ayHx8Y1Jn\\_o](https://youtu.be/ayHx8Y1Jn_o)

### 1. Bio Fortified Crops

- The **bio fortified crop- Madhuban Gajar** was developed by Shri Vallabhbhai Vasrambhai Marvaniya, a farmer scientist from Junagadh district, Gujarat.
- He was **conferred with a National Award by the President of India at Rashtrapati Bhavan, New Delhi** during Festival of Innovation (FOIN)–2017.
- He was also conferred with **Padma Shri in the year 2019 for his extraordinary work.**
- The **Madhuban Gajar is a highly nutritious carrot variety developed through the selection method with higher  $\beta$ -carotene content (277.75 mg/kg, source of Vitamin A) and iron content (276.7 mg/kg).**

#### Fortification

- Fortification is the **practice of deliberately increasing the content of an essential micronutrient, i.e. vitamins and minerals (including trace elements) in a food, so as to improve the nutritional quality of the food supply and provide a public health benefit with minimal risk to health**

#### Bio fortification

- Bio fortification is the **process by which the nutritional quality of food crops is improved through agronomic practices, conventional plant breeding, or modern biotechnology.**

#### Difference

- Bio fortification **differs from conventional fortification in that bio fortification aims to increase nutrient levels in crops during plant growth rather than through manual means during processing of the crops.**

#### Examples of bio fortification projects include:

- **iron-bio fortification** of rice, beans, sweet potato, cassava and legumes;
- **zinc-bio fortification** of wheat, rice, beans, sweet potato and maize;
- **provitamin A carotenoid-bio fortification** of sweet potato, maize and cassava; and
- **Amino acid and protein-bio fortification** of sourghum and cassava.

### 2. Samadhan Challenge

- The mega online challenge "SAMADHAN" has been launched by MIC and AICTE in collaboration with Forge and Innovation Curis **to test the ability of students and Educators to innovate.**
- The **participants in this challenge will design, simulate and develop such measures that can be made available to the government agencies, health services, hospitals and other services for quick solutions to the Coronavirus epidemic and other such calamities.**

#### Please Note:

#### Samadhan Doctrine:

An operational strategy 'SAMADHAN' to fight Left Wing Extremism. The elements of this strategy are:

1. **S for Smart Leadership.**
2. **A for Aggressive Strategy.**
3. **M for Motivation and Training.**
4. **A for Actionable Intelligence.**
5. **D for Dashboard-based Key Result Areas and Key Performance Indicators.**
6. **H for Harnessing Technology.**
7. **A for Action Plan for Each Theatre.**
8. **N for No access to Financing.**

#### Additional Info:

#### Indian Scientific Expedition to the Southern Ocean 2020

India's polar mission

- **11th expedition of an Indian mission to the Southern Ocean, or Antarctic Ocean**
- **The first mission took place between January and March 2004.**
- **This program was initiated by the Ministry of Earth Sciences (MoES) and is operated under National Centre for Polar and Ocean Research (NCPOR).**

## **Southern Ocean Research Program**

### **Six Core Projects**

- **Study hydrodynamics and biogeochemistry of the Indian Ocean sector of the Southern Ocean; involves sampling sea water at different depths. This will help understand the formation of Antarctic bottom water.**
- **Observations of trace gases in the atmosphere**, such as halogens and dimethyl sulphur from the ocean to the atmosphere. Will help improve parameterisations that are used in global models.
- **Study of organisms called coccolithophores that have existed in the oceans for several million years; their concentrations in sediments will create a picture of past climate. [[Like any other type of phytoplankton, Coccolithophores are one-celled plant-like organisms that live in large numbers throughout the upper layers of the ocean. Coccolithophores surround themselves with microscopic plating made of limestone (calcite).]]**
- **Investigate atmospheric aerosols and their optical and radiative properties.** Continuous measurements will quantify impact on Earth's climate.
- **Study the Southern Ocean's impact on Indian monsoons.**
- **Dynamics of the food web in the Southern Ocean; important for safeguarding catch and planning sustainable fishing.**

## **3. Antarctic Treaty System**

Antarctic Treaty and related agreements are collectively known as the Antarctic Treaty System (ATS)

### **Related Agreements:**

Protocol on Environmental Protection to the Antarctic Treaty

Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), 1982

### **Antarctic Treaty**

- **Signed in Washington on 1959 by the twelve countries whose scientists had been active in and around Antarctica during the International Geophysical Year (IGY) of 1957-58**
- **Entered into force in 1961**

### **IMP Provisions**

- **Antarctica shall be used for peaceful purposes only.**
- **Freedom of scientific investigation in Antarctica.**
- **Scientific observations and results from Antarctica shall be exchanged and made freely available.**
- **India is also party to this treaty.**

**Find out India's Research Centres In Antarctica.**

## POLITY

[https://youtu.be/V\\_Mk\\_AS1oXI](https://youtu.be/V_Mk_AS1oXI)

### 1. Arogya Setu

- The Arogya Setu app is designed to help control the spread of coronavirus and make its information accessible to the common people. This special app also helps in finding out corona positive people present nearby. After downloading, this app asks if you have cough, fever or trouble breathing etc. If you do not have any such problem, you will be in the Green Zone.
- This app tells user to keep the mobile phone's Bluetooth and location devices on. Whenever the user visits a crowded place, this app keeps sending messages from nearby mobile phones through the Bluetooth. When the user stands near someone who is also a normal it shows green zone. But if that person becomes corona positive after 10 days, this app will alert you immediately.
- This app is associated with Digital India for the health and well-being of every Indian has been developed in public-private partnership. Available in 11 languages, the app is designed for use on an all-India basis. The personal data collected by the App is encrypted using state-of-the-art technology and stays secure on the phone till it is needed for facilitating medical intervention.

### 2. Zoomraiding

- The lockdown has forced many to work from home. Unless the organisation has its own infrastructure and uses VPN (virtual private network) for accessing its resources, the use of public platforms may result in loss of confidential data. Recently, the popular videoconferencing app Zoom, which can add up to 100 participants in a call, has come across as vulnerable. As the meeting ID can be shared through a link, on screen and other mediums; uninvited guests can also join a meeting and gain access to sensitive information.
- When one uses Zoom, it seeks permission for accessing the user's microphone, web-cam and data storage. This can result in hijacking and loss of private data. Users may also experience 'Zoomraiding' or 'Zoombombing' in which hate speech, pornography or other content is suddenly flashed by disrupting a video call on Zoom. The Computer Emergency Response Team-India (CERT-In) circulated a 'vulnerability note' on February 6, giving Zoom a 'medium' security rating.

### 3. Dekho Apna Desh

- Ministry of Tourism has launched its "DekhoApnaDesh" webinar series from April 14 2020 to provide information on the many destinations and the sheer depth and expanse of the culture and heritage of our Incredible India. The first webinar, which was part of a series that shall unfold, touched upon the long history of Delhi as it has unfolded as 8 cities, each one unique in its character and leaving behind traces which makes Delhi the magnificent city that it is today. The webinar was titled "City of Cities- Delhi's Personal Diary".
- The series would work towards showcasing the diverse and remarkable history and culture of India including its monuments, cuisine, arts, and dance forms. Natural landscapes, festivals and many other aspects of the rich Indian civilization. The core of the session based itself on tourism awareness and social history and was conducted by the India city walks for Ministry of Tourism

### 4. E-NAM

- The pan-India Agriculture trading portal e-NAM completed four years of implementation on April 14, 2020. Keeping in view the need of making marketing of commodities easier for farmers, e-NAM was envisioned and launched by Prime Minister in 21 mandis on 14th April, 2016 which has now reached 585 mandis across 16 States and 02 UTs.
- It is an important tool to enhance farmer's accessibility digitally to multiple numbers of markets & buyers and to bring transparency in trade transactions with the intent to improve price discovery mechanism, quality commensurate price realization and also to develop the concept of One Nation One Market for agriculture produce. Farmers are free to register on e-NAM portal and they are uploading their produce for sale online to the traders across all e-NAM mandis and traders can bid for the lots available for sale on e-NAM from any location.
- In order to de-bottleneck Logistics of Agri Produce and providing adequate and timely transportation facility to

the farmers/traders during lockdown period, e-NAM platform has created an Interface with large transport aggregators like Blackbuck, Rivigo, Mavyn, Truck Suvidha, Truck Guru, Transin Logistics, Elastic Run etc. This would help traders to find and arrange timely movement of produces from mandi to various other locations.

## 5. Pradhan Mantri Bhartiya Janaushadhi Pariyojana

- Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP) scheme is being run by the Department of Pharmaceuticals, Ministry of Chemicals & Fertilizers, Government of India with an objective of providing quality and affordable healthcare to anyone in need.
- Mobile application “Jan Aushadhi Sugam” is also available for common public to locate their nearest Janaushadhi Kendra and availability of medicines with its price.
- In the lockdown period, Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP) is continuing to provide affordable medicines as well as is also generating awareness about the pandemic.

## 6. YUKTI

- Union Minister for HRD Shri Ramesh Pokhriyal “Nishank” launched a web-portal YUKTI (Young India Combating COVID with Knowledge, Technology and Innovation) on 12th April 2020. It’s a unique portal and dashboard to monitor and record the efforts and initiatives of MHRD. The portal intends to cover the different dimensions of COVID-19 challenges in a very holistic and comprehensive way.
- It will cover the various initiatives and efforts of the institutions in academics, research especially related to COVID, social initiatives by institutions and the measures taken for the betterment of the total well-being of the students. The portal will cover both qualitative and quantitative parameters for effective delivery of services to the academic community at large. He said that portal will also allow various institutions to share their strategies for various challenges which are there because of the unprecedented situation of COVID-19 and other future initiatives.

## 7. Swachhata App

- The Ministry of Housing and Urban Affairs in April 2020 announced the launch of a revised version of the existing Swachhata-MoHUA App.
- Swachhata App serves as an effective digital tool enabling citizens to play an active role in the Swachhata of their cities and increase accountability on the part of Urban Local Bodies (ULBs).
- The Swachhata-MoHUA App, a highly popular grievance redressal tool for citizens under the ambit of the Swachh Bharat Mission (Urban) already has over 1.7 Crore+ urban users across the country. This app has now been modified and strengthened further in order to enable citizens to get their COVID-related complaints also redressed by their respective ULBs.

## ECONOMY

<https://youtu.be/dPaTyuzIKdE>

# 1. Digital Divide

## Meaning

It refers to the uneven distribution or lack of AAA (availability, accessibility and affordability) of Information and Communication Technologies (ICT) between various groups of a population.

## Why in News

Digital technologies —

especially social media platforms and technologies — are playing a crucial role in managing the pandemic by opening multiple channels of:

- Communication with colleagues
- Collaboration
- Ordering goods online
- Diagnostics, Care work
- Education
- Financial Transactions
- Surveillance, etc.

## Apart from information spread

**Psychologists:**

Video-calling, group-calling, facilities help lessen mental stress in people who are forced to stay at home.

## Some Concerns

- Rumor Mongering / Fake News
- Digital Divide
  - Digital illiteracy
  - Lack of Infrastructure
  - Digital Security
  - Penetration of digital network

## Digital Divide and India

- India has nearly 65 crore people having access to the web.
- It is the second-largest internet user-base in the world, behind China.

**TRAI:**

- India's total internet density stands at about 49 per cent. 25 per cent of India's village population has access to internet services.
- In urban centres, the internet density is nearly 98 per cent.

**Internet and Mobile Association of India (IAMAI):**

- Total number of monthly active internet users: 45 crore.
- Men: 30 crore
- Women: 15 crore
- This divide, gets worse as we reach the villages from city centres.
- The divide is starker in north India while States in the south have better networks.

## UN's Digital Economy Report

Warned that the digital divide will worsen inequalities if global collaborative efforts are not taken.

## 2. Rupee NDF & GIFT

### What is a Non-Deliverable Forward

- It is a cash-settled, and usually short-term, forward contract.
- The notional amount is never exchanged, hence the name "non-deliverable."
- The counterparties settle the difference between contracted NDF price and the prevailing spot price.

### What is Onshore and Offshore Currency Trading

- When the currency is traded vis-à-vis other foreign currencies **within the shores** it is called **onshore currency** markets.
- In India, it is closely regulated by the nodal regulators like the **RBI and SEBI**.
- **Offshore markets** are traded in a **neutral country**.
- For example, the USD-INR contract is traded in over the counter (OTC) market in London, Singapore and Dubai.
- This is also popularly called the Non-Deliverable Forward (NDF) market.
- These are **outside the purview of the RBI and SEBI**, which is one of the reasons the regulators are wary of such offshore markets.
- These offshore markets are **preferred by large traders** and investors to hedge their risk considering that **they are less regulated and the costs are much lower**.

### An Important Concern:

- The size of the rupee NDF market has grown larger than the onshore forward market.
- The offshore trades have begun to play a larger role in price discovery.

### Usha Thorat Task Force:

- NDF market driving onshore exchange rate.

### RBI's Attempt

- To begin moving the control over rupee value, back to India.

### How to do it:

- Begin the trading of rupee derivatives on exchanges in the GIFT IFSC.
- To allow banks in the GIFT IFSC to trade in rupee non-deliverable forwards.

### Latest News

- RBI announced banks in India will be allowed to participate in the rupee NDF (Non-deliverable Forward) market from June 1, 2020.
- RBI has permitted Indian banks which operate banking units in the GIFT IFSC (IFSC Banking Unit - IBUs) and have the licence to act as an authorised forex dealer to participate in the NDF market from June.
- Banks can trade through their branches in India, their foreign branches or through their IBUs.

### Way Ahead

#### Important Concern: Liquidity.

- Platforms with large volumes can execute transactions with minimal impact cost.
- **Required:** An initial pool of traders or hedgers are needed who consistently execute big transactions.

#### How it can be done:

- Give easy access to FPIs registered in India and NRIs.
- RBI should allow individuals from opening bank accounts in IBUs.
- This will attract Indian HNIs (high net-worth individuals) from participating in the GIFT IFSC.
- **Another Important Concern that needs to be addressed:** Dispute resolution System or Arbitration Process.

## 3. Globalisation & COVID-19

### There will be greater push for

- Economic insularity
- Efforts at localisation of supply chains
- Stricter immigration controls

### Unemployment

Unemployment has surged in the Western world. There are around:

- 16 million jobless claims in the US
- One million jobs lost in March in Canada
- A few millions unemployed in Europe
- Most job losses will be at the lower end of the skills hierarchy.
- Immigrant workers will be impacted.
- MSMEs in emerging economies enormously depend on export orders.

ILO:

- The pandemic will potentially wipe out the equivalent of 195 million jobs worldwide.
- In India, MSMEs — which account for more than 45 per cent of total exports and employ more than 110 million people — face cancelled orders and a freeze in new orders from buyers in the US and Europe.

### Commodities and Raw Materials

- Africa will lose billions of dollars in export revenue in commodities and oil.
- Capital-intensive industries, including in commodities and extractives, mean that economic slowdown looms large on the continent.
- China — the epicentre of Covid-19 — is a key trading partner for Africa.

### Services and Global tourism

- Global tourism accounts for 8 per cent of services trade worldwide.
- There will be millions of jobs threatened in Asia Pacific and Africa, two of the fastest growing tourism hubs in the world.
- Restrictions on travel may continue, until Covid has fully run its course.

### WTO

- World Trade Organisation (WTO) estimates international trade to steeply decline by up to 32 per cent.
- It is much greater than the impact felt during the 2008 financial crisis.

### Some Initiatives

- Japan has earmarked \$2.2 billion of its stimulus package.
- It is to help manufacturers move production units out of China.
- This attempts to reduce dependence on Chinese supplies and inputs.

## 4. Monetary Policy Report

### Released by

- RBI.
- **Key Takeaway:** Unanticipated Downward Surprises.
- **Causing:** Decreased GDP growth rates

### Reasons

- Weak private consumption
- Collapse in fixed capital formation
- External demand impacted by prospect of global recession
- Domestic output impacted by the lockdown

### Expectations:

- Weak demand and the crude oil collapse to moderate CPI inflation.

## Past predictions and Reality

- MPC estimated CPI at 3.5 per cent for Q3 FY20 and 3.7 per cent for Q4 FY20.
- The committee found actual rates overshooting at 5.8 per cent and 7.1 per cent respectively.

## Reason for slip-up

- Unseasonal rains that disrupted the kharif crop
- Spike in onion prices
- Cost-push factors such as higher mobile tariffs

## The basis for MPC's Predictions

- MPC relies heavily on the RBI's:
  - Forward-looking surveys of households on inflation expectations
  - Industries on output
  - Professional forecasters on growth.

## Problem with this:

- Such surveys capture prevailing sentiment far more than fundamentals.
- They are subject to change at short notice.

# 5. IMF & Debt Relief

## What's the News?

IMF: It would provide immediate debt relief to 25 member countries.

Under:

- Catastrophe Containment and Relief Trust (CCRT).
- It will help focusing more financial resources on fighting the coronavirus pandemic.

## About CCRT

Established: February 2015.

- Then, the IMF transformed the Post-Catastrophe Debt Relief (PCDR) Trust to create the Catastrophe Containment and Relief (CCR) Trust.
- It broadened the range of situations covered by IMF disaster assistance to include fast-spreading epidemics.
- It allows IMF to provide grants for debt relief for the poorest and most vulnerable countries that are hit by catastrophic natural disasters or public health disasters.
- The relief on debt service payments frees up additional resources to meet exceptional balance of payments needs created by the disaster, and for containment and recovery efforts.
- The new trust complements donor financing and the Fund's concessional lending through the Poverty Reduction and Growth Trust (PRGT).

## Structure of the CCRT

The CCR Trust has two windows:

1. A Post-Catastrophe Relief window, to provide exceptional assistance in the wake of a catastrophic natural disaster
2. A Catastrophe Containment window, to provide assistance in containing a public health disaster.

The windows have different purposes, qualification criteria, and assistance terms.

## ENVIRONMENT

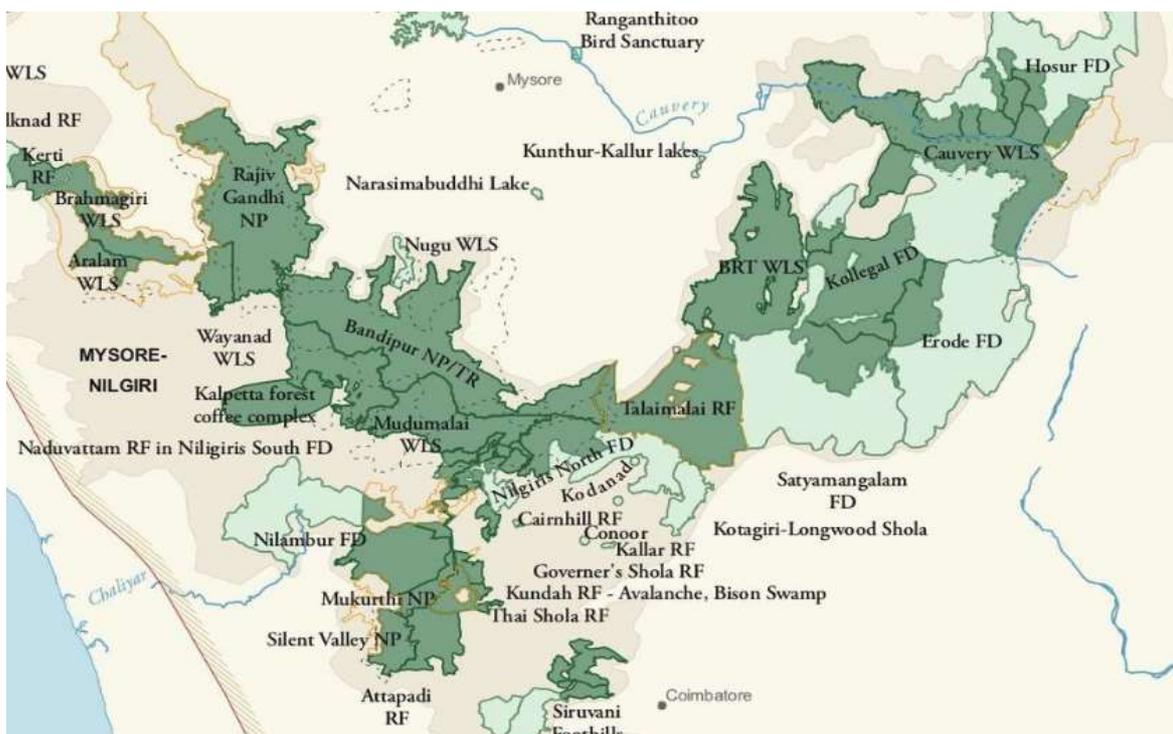
<https://youtu.be/EHXQ5k-97Go>

### 1. Renewable Energy Certificates

- Sales of renewable energy certificates rose over 79 per cent to 8.38 lakh units in March compared to 4.68 lakh in the same month a year ago owing to good supply, according to official data.
- Renewable Energy Certificates (RECs) are a type of market-based instrument.
- One REC is created when one megawatt hour of electricity is generated from an eligible renewable energy source.
- It helps to promote renewable sources of energy and development of the market in electricity.
- In India, RECs are traded on two power exchanges — Indian Energy Exchange (IEX) and Power Exchange of India (PXIL).
- The price of RECs is determined by market demand, and contained between the ‘floor price’ (minimum price) and ‘forbearance price’ (maximum price) specified by the Central Electricity Regulatory Commission (CERC).
- Under the renewable purchase obligation (RPO), bulk purchasers like discoms, open access consumers and capacitive users are required to buy certain proportion of RECs. They can buy RECs from renewable energy producers to meet the RPO norms.
- The proportion of renewable energy for utilities is fixed by the central and state electricity regulatory commissions.
- The REC mechanism is a market-based instrument to promote renewable sources of energy and development of market in electricity.
- It provides an alternative voluntary route to a generator to sell its electricity from renewable sources just like conventional electricity and offer the green attribute (RECs) separately to obligated entities to fulfil their RPO.

### 2. Wayanad Wildlife Sanctuary

- It is located in Wayanad, Kerala, India.
- Established in 1973, the sanctuary is now an integral part of the Nilgiri Biosphere Reserve.
- It is bounded by protected area network of Nagarhole and Bandipur of Karnataka in the northeast, and on the southeast by Mudumalai of Tamil Nadu.



- It is part of the Deccan Plateau and the vegetation is predominantly of the south Indian moist deciduous teak forests.
- Also, the sanctuary has pastures of the west-coast semi-evergreen trees.
- The wildlife sanctuary comes under Protect Elephant and one can spot herd of elephants roaming in the area
- Wayanad Wildlife Sanctuary is one of the safest havens for different species of vultures like the White-rumped Vultures and the Red-headed Vultures.

### 3. Egyptian Vultures

- Until a few years ago, Egyptian Vultures were sighted all over Tamil Nadu.
- Now, their population is in single digits.

#### Reasons for decrease in population –

- Use of Diclofenac as veterinary drug
- Besides carcass, this species also feeds on worms in cow dung, and other insects and bugs.
- The use of de-worming drugs in cattle and pesticide-laden insects could have also wreaked havoc on the diet of Egyptian vultures.
- Vultures often congregate around tanneries looking for food.
- The use of chemicals laden with chromium, sodium and ammonium in tanneries might have also affected the population.



- At a recently concluded meeting of the Vulture Conservation Working Group - South India at Salim Ali Centre

for Ornithology and Natural History at Anaikatti, near Coimbatore, the importance of establishing Vulture Safe Zones (VSZs) in Tamil Nadu was discussed.

- The concept of Vulture Safe Zones (VSZs) were developed in South Asia as an in-situ approach to remove the threat to Vultures from diclofenac, and other toxic NSAIDs used in veterinary practice and to ensure free from carcass poison.
- The VSZ, usually set up in a 100km radius, focusses on engaging local authorities and communities.
- They are motivated to ensure a safe zone for vulture by removing threats to its survival.
- The International Union for Conservation of Nature (IUCN) lists White-backed Vulture, Long-billed Vulture, Red-headed Vulture and Slender-billed Vulture as Critically Endangered species, which is the penultimate stage before which they go extinct.
- If one goes by the numbers of Egyptian vultures in Tamil Nadu, the needle points to its Critically Endangered status, but IUCN lists it as Endangered as it is not yet 'critical' in other parts of the world

## 4. New Pit Viper in Arunachal Pradesh Named After Harry Potter Character

- A new species of green pit viper found in Arunachal Pradesh, *Trimeresurus salazar*, is the fifth variety of reptile to have been discovered in Arunachal Pradesh in a little more than a year.
- A group of researchers who recorded this serpent has named it Salazar's pit viper.
- The name was inspired by Salazar Slytherin, the co-founder of J.K. Rowlings' fictional Hogwarts School of Witchcraft and Wizardry.
- Pit vipers are venomous snakes distinguished by their heat-sensing pit organs between the eye and the nostril.



## SCI & TECH – (HEALTHCARE)

<https://youtu.be/wD8s0up1nI8>

### 1. Arogya Setu and Sahyog App

#### Arogya Setu

- It is a government endorsed application that helps trace the contacts of those who may have been infected by COVID-19
  - Survey of India has made public a trove of maps
- The app is a coronavirus tracker of sorts works on the basis of contact tracing and can help a user identify possible coronavirus ‘hotspot’ around a person’s area
- It can help people stay safe and adopt necessary precautions, thus help prevent community transmission to an extent
- By the basis of geo tagging, it can also alert a specific user about their proximity to a nearby infection case or hotspot
- It also helps users self-identify their risk and monitor their health assessment, considering the times when it can get difficult (and most of all, is not particularly safe to step out and visit health clinics)
- Aarogya Setu app also helps people identify the symptoms, alert them about the best safety precautions and other relevant information concerning the spread of COVID-19

#### Sahyog App

- Survey of India has developed a mobile application named Sahyog for its users viz Government (Centre/State) departments, Organisations, Institutions, Govt employees. Academic Institutions, Students and citizens of India, to voluntarily support and contribute in preparing updating and enriching the national database of the country
  - Survey of India is the National Mapping Agency of the country under Department of Science & Technology

### 2. Contact Tracing

- It is the process of identifying, assessing and managing people who have been exposed to a disease to prevent transmission
- People who may have been exposed to the virus from affected countries are to be traced and monitored for 28 days

#### Who is a Contact?

- Any person who had contact with patients under treatment for suspected, probable or confirmed case of coronavirus
- Any person who provided care for the patient suspected or confirmed with the disease, including a health care worker or family member

### 3. Herd Immunity

- It is the indirect protection from a contagious infectious disease that happens when a population is immune either through vaccination or immunity developed through previous infection
  - Enough people are immune to a disease that it stops spreading
- Even people who aren’t vaccinated, or in whom the vaccine doesn’t trigger immunity, are protected because people around them who are immune can act as buffers between them and an infected person
- Once herd immunity has been established for a while, and the ability of the disease to spread is hindered, the disease can eventually be eliminated
  - This is how the world eradicated smallpox
- Natural herd immunity (achieved through infection rather than vaccination) can be challenging to induce through unchecked infection as there would be a very high rate of serious illness and death
- Even when vaccines are available, it is not always possible to achieve herd immunity for very long. Some viruses, such as seasonal flu, mutate frequently, evading the body’s immune response

## COVID-19 & Herd Immunity

- The more infectious a disease, the greater the population immunity needed to ensure herd immunity
- COVID-19 has a lower infection rate than measles, with each infected person passing it on to two or three new people, on average
  - It means that herd immunity should be achieved when around 60% of the population becomes immune to COVID-19

## 4. SATYAM

- Department of Science and Technology (DST) has invited proposals to study appropriate intervention of yoga and meditation in fighting COVID-19 and similar kinds of viruses
  - Proposals have been invited under the Science and Technology of Yoga and Meditation (SATYAM) programme of the DST, a department under the Ministry of Science and Technology
- The project may address improving immunity, improving respiratory system and interventions to overcome respiratory disorders and other dimensions like stress, anxiety and depression-related issues due to isolation, uncertainty and disruption in normal life
- SATYAM is a cognitive science programme
- COVID-19 has three dimensions
  - Stress (worry sitting at home)
  - Respiratory
  - Immune System

## 5. Chitra Gene LAMP-N

- Sree Chitra Tirunal Institute for Medical Sciences and Technology has developed a much cheaper and faster diagnostic test kit which is high confirmatory for the diagnosis of COVID-19
- The test kit can detect the 'N Gene' of SARS COV2 using reverse transcriptase loop-mediated amplification of viral nucleic acid (RT-LAMP)
- This technology can check 100 percent matching with PCR (Polymerase chain reaction) and accuracy
- The test kit can detect two regions of the gene which will ensure that the test does not fail even if one region of the viral gene undergoes mutation during its current spread
- ICMR will approve the kit following which license need to be obtained from CDSCO for manufacture
- Current PCR kits in India enable detection of E gene for screening and RdRp gene for confirmation.
  - Chitra Gene LAMP-N gene testing will allow confirmation in one test without the need for a screening test and at much lower costs

### Proteins in Coronavirus

- COVs are enveloped, positive-stranded RNA viruses possessing a comparatively large genome and comprising of four structural proteins
  - Spike (S): Responsible for virus attachment to the receptor and fusion with cell membrane
  - Nucleocapsid (N): Interacts with the viral RNA to form the ribonucleo protein
  - Envelope (E): Helps in virions assembly and comprises ion channel actions
  - Membrane (M): Shares in the assembly of new virus particles
- The four structural gene i.e., S, N, E and M, and two non-structural gene, RNA dependent RNA polymerase (RdRP) and main protease (Mpro) genes were studied recently