

CURRENT AFFAIRS

WEEKLY

WEEK: 3

APRIL
2021

MAINS

GS-I

A hotter Iran means increased monsoon flow on the Indian subcontinent

GS-II

BIMSTEC needs to reinvent itself

GS-III

G-SAP 1.0: Securities acquisition plan to boost the market

GS-III

RBI favors retaining 'current inflation targeting regime'

GS-IV

Ethical Issues in Biotechnology

PRELIMS

GEOGRAPHY • International Quiet Ocean Experiment (IQOE)

HISTORY & CULTURE • A 3000-year-old 'lost golden city' discovered in Egypt

INTERNATIONAL RELATIONS • China-Bhutan Boundary Talks

• E9 initiative of 'Scaling up digital learning to accelerate progress towards SDG4

POLITY • Anamaya: Tribal Health Collaborative

ECONOMY • RBI not in favor of supervising NUES

ENVIRONMENT • Ken-Betwa linking project
• Tiger relocation project fails

SCIENCE & TECHNOLOGY • Algorithm for Aditya L1 mission
• Government launches NanoSniffer Explosive trace detector

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— Disclaimer —

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 (APRIL, 2021)

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IAS 2022

GS FOUNDATION

1 Year & 2 Year PROGRAMME

REGULAR BATCH

BATCH STARTS **26** APRIL 2021

WEEKEND BATCH

BATCH STARTS **30** MAY 2021

PATHWAYS

for UNDER GRADUATES

3 & 2 Year IAS FOUNDATION PROGRAMME

BATCH STARTS
12 APRIL 2021

OPTIONAL FOUNDATION 2022

HISTORY

FOUNDATION 2022

By: PIYUSH KUMAR

BATCH STARTS **10** MAY, 2021

GEOGRAPHY

FOUNDATION 2022

By: PRINCE MISHRA

BATCH STARTS **10** MAY, 2021

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SECTION: A
(MAINS)

CURRENT AFFAIRS

A HOTTER IRAN MEANS INCREASED MONSOON FLOW ON THE INDIAN SUBCONTINENT

CONTEXT

New research conducted at the University of Kansas suggests that the positive dust–monsoon correlation can be partially attributed to the heating of the Iranian Plateau.

◎ BACKGROUND

- Monsoon is a familiar climatic phenomenon though little known.
- Despite the observations over centuries, the monsoon continues to perplex scientists.
- Many attempts have been made to discover the exact nature and causation of the monsoon, but so far, not a single theory has been able to explain the monsoon in its entirety.
- Recently when it was studied at the global rather than at regional level a real breakthrough has come

◎ ANALYSIS

What is the mechanism of the Indian Monsoon?

- Till 19th century, it was believed that the continentality during the summer responsible to set start the flow of monsoon winds towards the Indian subcontinent
- When the sun shines vertically over the Tropic of Cancer during April and May, the Indian subcontinent in the north of the Indian Ocean gets heated intensely. This leads to the formation of intense low pressure in the northwestern part of the Indian subcontinent.
- Due to continentality, the pressure in the Indian Ocean in the south of the subcontinent is high as water is heated slowly, the low-pressure region attracts the southeast trade winds across the Equator. These conditions help in the northward shift of the ITCZ.
- The southwest monsoon may thus, be seen as a continuation of the southeast trade winds deflected towards the Indian subcontinent after crossing the Equator due to the Coriolis effect.
- These southeast trade winds cross the Equator between 40°E and 60°E longitudes.
- The upward shift in the position of the ITCZ is also related to the withdrawal of the westerly jet stream from its position over the north Indian plain, south of the Himalayas.

- Only after the western jet stream has withdrawn itself from the region the easterly jet stream sets in along 15°N latitude. This easterly jet stream is held responsible for the onset of the monsoon in India.
- However, the aerosol present over the Arabian Sea, Iranian Plateau, and southward slope of Tibetan plateau plays an important role in modulation of South Western Indian Monsoon

What are aerosols?

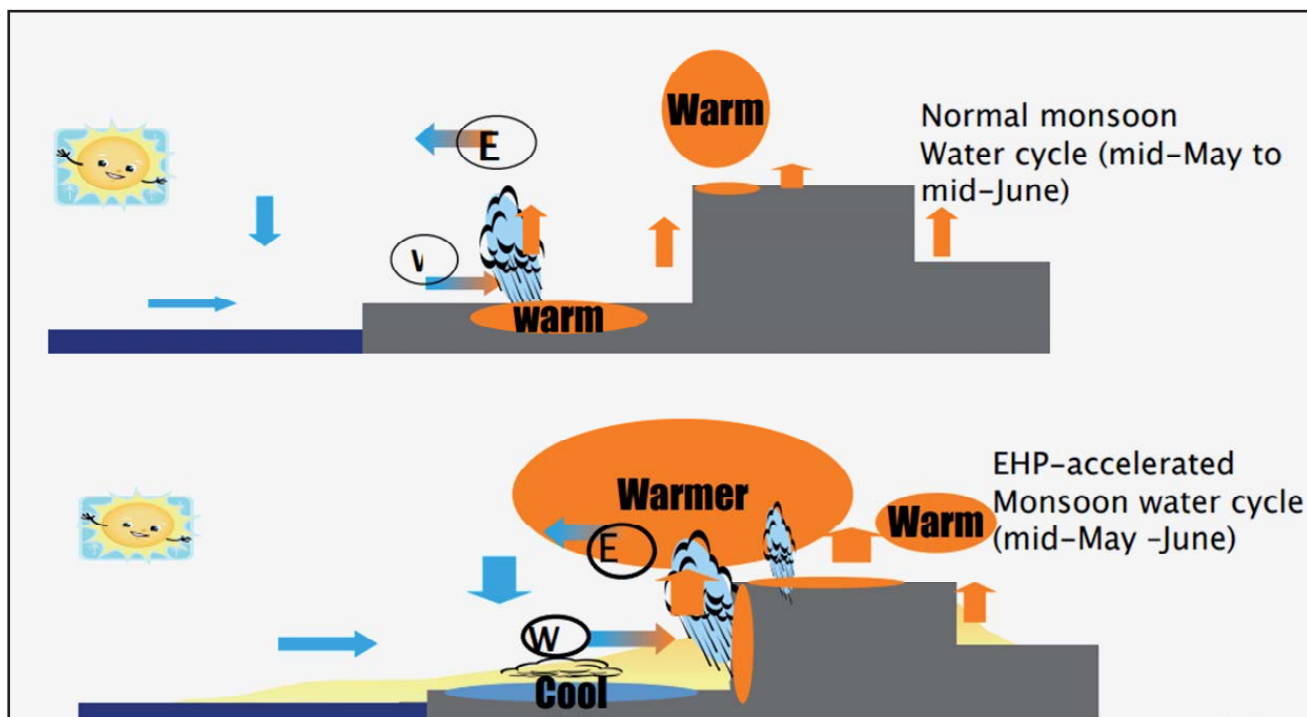
- An aerosol is a suspension or colloid of fine solid particles or liquid droplets in a gas medium. Aerosol comes from both anthropogenic (industry, motor vehicles), and natural sources (forest fires, oceanic haze, deserts). For example soot (black carbon), organic carbon, dust, sea salt.
- If these particles are sufficiently large we observe their presence when they scatter and absorb sunlight. The scattering of sunlight can reduce visibility (due to the formation of haze) and redden sunrises and sunsets.

How aerosols affect the Indian monsoon?

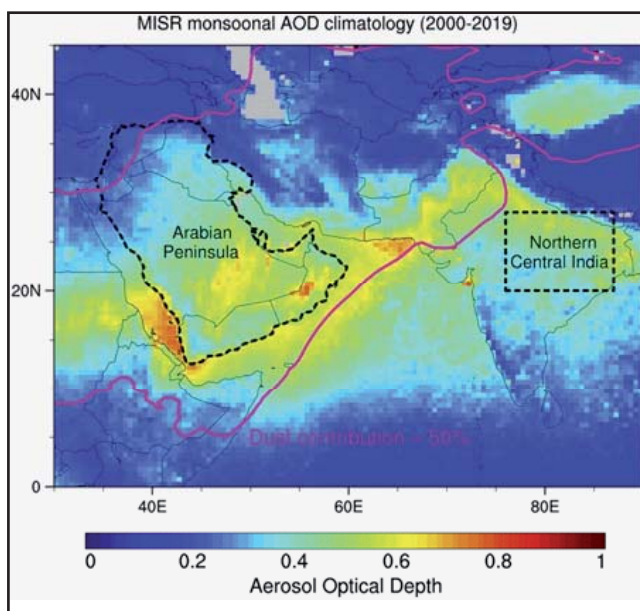
- The heavy aerosol layers mainly composed of anthropogenic aerosols, including black carbon and sulphate, over South Asia can cool the surface by scattering and absorbing the solar radiation, which reduces the ocean–land thermal difference and in turn weakens the Indian Monsoon, this is called “global dimming” or “solar dimming” effect.
- On the other hand, aerosols (e.g., black carbon and mineral dust) that absorb sunlight reducing the albedo, accumulate over the southern slope of the Tibetan Plateau heats the mid-troposphere, strengthening monsoon convection over North India. This is referred to as the Elevated Heat Pump (EHP) effect.

What is Aerosol Optical Depth?

- Aerosol optical depth is a measure of the extinction of the solar beam by dust and haze in which particles (dust or smoke) in the atmosphere blocks sunlight by absorbing or scattering light.



- AOD tells us how much sunlight is prevented from reaching the ground by these aerosol particles.
- A value of 0.01 corresponds to an extremely clean atmosphere, and a value of 0.4 would correspond to a very hazy condition
- **Aerosol Optical Depth above Arabian Sea Region**



- **What is the reason for high AOD around Arabian Peninsula?**
- Over the Arabian Peninsula and the northwestern Arabian Sea, more than 50% of the AOD is contributed by mineral dust.

- Tons of dust aerosols emitted from the Arabian Peninsula and its surrounding areas are transported to the Arabian Sea by the strong north-westerly "Shamal" winds during boreal summer.
- How high concentrations of aerosol over the Arabian Sea affect Indian Monsoon?
- The dust aerosols over the Arabian Sea could heat the lower and mid-troposphere, forming a heat low over the Arabian Sea which strengthens the south-western monsoon branch
- Observations showed that AOD over the Arabian Sea and the southern Arabian Peninsula is significantly and positively correlated with the Indian Monsoon rainfall in the southwest coastal regions, Northern Central India, and the southern slope of the Tibetan Plateau.
- A global model simulation showed that the monsoonal rainfall responses to dust are negative in Northeast India yet positive in South India.
- Correlation between the heating of Iranian Plateau and Arabian Dust and Indian Monsoon
- The summertime temperature in the mid-troposphere over the Iranian Plateau was found to be positively correlated with:
- Indian Monsoon rainfall at the inter-decadal timescale from 1967 to 2015, and
- Summertime near-surface Shamal wind and AOD over the Arabian Peninsula and the Arabian Sea from 2000 to 2013.



- The researchers proposed a hypothesis that the observed positive dust–monsoon correlation could be partially attributed to the heating over the Iranian Plateau, which could intensify the dust emissions over the Arabian Peninsula through strengthening the “Shamal winds” as well as the Indian Monsoon circulations and rainfall at the
- Many factors could contribute to the mid-troposphere temperature variation over the Iranian Plateau, and further studies are needed to identify them. However, it is noteworthy that soil moisture and dust are two potential factors that can influence the mid-troposphere temperatures over the Iranian Plateau.

inter-decadal timescale.

BIMSTEC NEEDS TO REINVENT ITSELF

CONTEXT

- In a recent development, the foreign ministers of the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) met virtually.
- This virtual meeting led to the finalization of 'Connectivity Master Plan' for Bay of Bengal Region.

◎ BACKGROUND

- While most multilateral groupings from G20 to SCO (Shanghai Cooperation Organisation) and ASEAN (Association of Southeast Asian Nations) held their deliberations at the highest political level amid COVID-19 pandemic in 2020, BIMSTEC leaders failed to do so.
- BIMSTEC could not even arrange its ministerial meeting until April 2021 whereas meeting of SAARC (South Asian Association for Regional Cooperation) leaders held at India's initiative a year ago.

◎ ANALYSIS

About BIMSTEC

- The BIMSTEC region is home to around 1.5 billion people which constitute around 22% of the global population with a combined gross domestic product (GDP) of \$3.5 trillion.
 - ▶ In the last five years, the BIMSTEC Member States have been able to sustain an average 6.5% economic growth trajectory despite global financial meltdown.
 - ▶ Initially, it was an economic bloc of four Member States with the acronym 'BIST-EC' (Bangladesh, India, Sri Lanka and Thailand Economic Cooperation).
 - ▶ It was renamed as BIMSTEC following the inclusion of Myanmar on 22 December 1997.
 - ▶ In 2004, after Nepal and Bhutan joined the organization the full name of the grouping was changed to 'Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation'.

What is the aim of BIMSTEC?

- BIMSTEC aims to strengthen ties between and among member states in various areas of cooperation. According to the Bangkok Declaration of 1997, the aims and purposes of BIMSTEC are to:
 - ▶ create an environment to enable rapid economic development,

- ▶ accelerate social progress in the sub-region,
- ▶ promote mutual assistance and active collaboration on matters of common interest,
- ▶ provide assistance to each other in the form of training and research facilities,
- ▶ cooperate more effectively in joint efforts that are supportive of, and complementary to, national development plans of member states,
- ▶ maintain close and beneficial cooperation with existing international and regional organizations, and
- ▶ cooperate in projects that can be dealt with most productively on a sub-regional basis and which make best use of available synergies

What are the areas of cooperation?

- There are fourteen priority sectors identified by member states. Each sector is led by a member state voluntarily

S. No.	Areas of Cooperation	Lead Country
1	Trade and Investment	Bangladesh
2	Technology	Sri Lanka
3	Energy	Myanmar
4	Transport and Communications	India
5	Tourism	India
6	Fisheries	Thailand
7	Agriculture	Myanmar
8	Cultural Cooperation	Bhutan
9	Environment and Disaster Management	India

10	Public Health	Thailand
11	People-to-People Contact	Thailand
12	Poverty Alleviation	Nepal
13	Counter-Terrorism and Transnational Crime	India
14	Climate Change	Bangladesh

Progress made by BIMSTEC

- The draft for the BIMSTEC charter has been cleared by Foreign Ministers recommending its earlier adoption
- They also endorsed the rationalisation of sectors and sub-sectors of activity, with each member-state serving as a lead for the assigned areas of special interest.
- The foreign ministers also conveyed their support for the Master Plan for Transport Connectivity, which will be adopted at the next summit.
- The recent ministerial meeting also endorsed 3 MoUs/agreements relating to cooperation between diplomatic and training academies, convention on Mutual Legal Assistance in Criminal matters and establishment of BIMSTEC Technology Transfer Facility in Colombo.
- Much has been achieved in Humanitarian Assistance and Disaster Relief (HADR) and security, including counterterrorism, cyber security, and coastal security cooperation

Pending BIMSTEC FTA

- A 2018 study by the Federation of Indian Chambers of Commerce and Industry (FICCI) had suggested that BIMSTEC urgently need a comprehensive Free Trade Agreement.
- It should cover trade in goods, services and investment; adopt policies that develop regional value chains; promote regulatory harmonisation; and eliminate non-tariff barriers. Also lacking was an effort to engage and enthuse the vibrant business communities of these seven countries, and expand their dialogue, transactions and interactions.

- Over 20 rounds of negotiations to operationalise the BIMSTEC Free Trade Area Framework Agreement, signed in 2004, are yet to bear fruit, due to disagreement between India and Thailand over market access for professionals, duty cuts on traded goods and policy relaxation.

What are the obstacles for BIMSTEC success?

- A strong BIMSTEC presupposes cordial and tension-free bilateral relations among all its member-states. This has not been the case, given the course of India-Nepal, India-Sri Lanka, and Bangladesh-Myanmar ties in recent years.
- The uncertainties hang around SAARC, complicating the matter. Both Nepal and Sri Lanka want the SAARC summit revived, even as they cooperate within BIMSTEC, with attenuated zeal.
- The China's decisive intrusion in the South and South-East Asian space has cast dark shadows. A renowned Bangladeshi scholar argued at a recent conference that BIMSTEC would make headway if China is accepted as its principal partner and interlocutor.
- This perspective has hardly any takers in India and its friendly partners in the grouping. Finally, the military coup in Myanmar, brutal crackdown of protesters and continuation of popular resistance resulting in an extended impasse have produced a new set of challenges.
- Despite them, the BIMSTEC foreign ministers could meet virtually — but will it be as easy for the summit to be held, with the much-maligned Commander-in-Chief Min Aung Hlaing from Myanmar at Colombo?

◎ CONCLUSION

- As BIMSTEC embraces to celebrate its silver jubilee next year, it faces a serious challenge: "a paradigm-shift in raising the level of our cooperation and regional integration".
- BIMSTEC needs to reinvent itself, possibly even rename itself as 'The Bay of Bengal Community'. It should consider holding regular annual summits at top political levels. Only then its leaders can convince the region about their strong commitment to the new vision they have for this distinct platform linking South Asia and Southeast Asia.

G-SAP 1.0: SECURITIES ACQUISITION PLAN TO BOOST THE MARKET

CONTEXT

The RBI has announced its calendar for purchasing G-secs. It is Government Securities Acquisition Programme or G-SAP 1.0, aimed at providing more comfort to the bond market.

◎ BACKGROUND

- The RBI has announced its liquidity measures to ensure that the banks loosen their wallets and needy segments of the economy get credit at reasonable rates.
- This, in turn, will help the RBI to do its job as the enabler of government borrowing and its role of in-charge of financial stability.
- It looks similar to quantitative easing of advanced economies, but the RBI programme is short-term in nature, confined to G-secs and is not targeted to stimulate the economy

◎ ANALYSIS

What is the plan?

- The plan is to pave a path for stable and orderly evolution of the **yield curve** in addition to a comfortable liquidity situation in the economy.
- It is an attempt to ensure compatible financial conditions for the recovery to gain traction.
- For **Q1 (Financial year) of 2021-22**, therefore, it has been decided to announce a **G-SAP worth ₹1 lakh crore**.

What are government securities, or g-secs?

- The government borrows through the issue of government securities called **G-secs and Treasury Bills or Gilt-edged securities**.
- It is a loan taken by the government and falls under capital receipts.
- It is the total amount of money that a government borrows to fund its spending on public services and benefits.
- When the tax revenue falls short in financing the government's spending programme, the government announces an annual borrowing programme in the Budget.

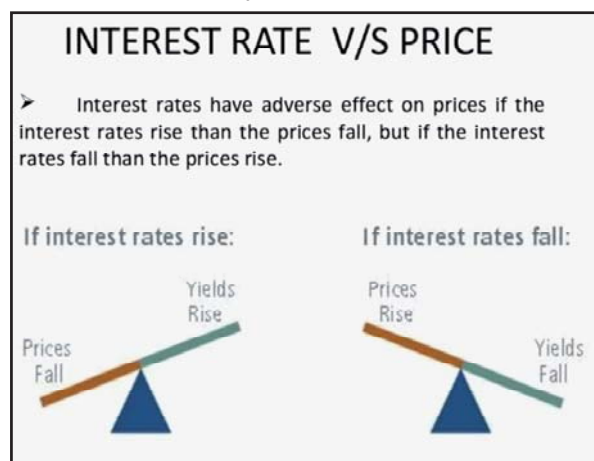
It is **debt instruments** (it's a liability and one has to pay interest for it) issued by the government to borrow money. The two key categories are:

1. **Treasury bills** are short-term financial instruments that mature in 91 days, 182 days, or 364 days, and

2. **Dated securities** are long-term financial instruments, which mature anywhere between 5 years and 40 years.
- The G-secs are not tax-free.
 - These are generally considered as one of the safest forms of investment because they are backed by the government. So, the risk of default is almost nil. Still, they are not completely risk-free, as they are always subjected to fluctuations in interest rates.
 - ▶ Previously to improve retail participation the retail investors are allowed to directly open their gilt accounts with RBI, and trade in government securities.

Why does bond yield go up and down?

- Let's understand it using an example. If the GDP of the economy is going down and the share market is plunging. The investors will pull out their money from the equity market and invest it in a safer instrument like government bonds. Because of this, the demand for government bonds (securities) increases and the bond prices go up.
 - ▶ A fall in interest rates makes bond prices to rise, and bond yield to fall.
 - ▶ Rising interest rates results in bond prices to fall, and bond yield to rise.



What are the economic implications of an increase in bond yield?

- Bond yields possess great signalling abilities about inflation path and economic direction.

- A rise in yield indicates a rise in interest rates in the economy.
- Yields also reflect the status of the centre's market borrowing to fund its expenditure.
- **Higher yields raise borrowing costs** for the governments and companies, hurting their ability to service debt and makes new investments.
- This has a limiting effect on their profits and stock prices.

How is G-SAP different from the regular Open Market Operations (OMOs)?

- The RBI intermittently purchase Government bonds from the market through Open Market Operations (OMOs). **The G-SAP is in a way an OMO but there is a commitment by the central bank to the markets that it is certainly going to purchase bonds worth a specific amount.** The intention is to give comfort to the bond markets. In other words, it can be said that **G-SAP is an OMO with a 'distinct character'.**

Open market operations (OMO): It is an act by the central bank of buying or selling short-term Treasury's and other securities in the open market to keep a check on the money supply, thus affecting the **short-term interest rates.**

- The RBI has said that the **positive externalities** of G-SAP 1.0 operations can be looked at in the backdrop of those segments of the financial markets that rely on the G-Sec yield curve as a pricing benchmark.

Definition of Positive Externality: This occurs when the consumption or production of good results in a benefit to a third party. Ex: When one consumes education, it gets a private benefit. But in the whole process, there are also benefits to the rest of society

What other benefits does the G-SAP offer?

- The market is always interested in knowing the Open Market Operations (OMO) purchase calendar of the RBI, and **now it has been provided to the market through this announcement on G-SAP.**
- It will provide comfort to the bond market participants with regard to RBI's commitment to support the bond market in this fiscal year (FY22).
- A structured purchase program will definitely settle the investor's nerves and help market participants to bid better through scheduled auctions and reduce the instability in bond prices.
- The structured programme will help **reduce the**

gap between the repo rate and the 10-year government bond yield. That, in turn, will help to reduce the cost of borrowing for the Centre and states in this fiscal year (FY22).

Why G-SAP?

Government borrowing plays an important role in the government's finances to meet its spending requirements to meet its fiscal targets.

- The **G-SAP 1.0**, has promised to buy government bonds worth ₹ 1 lakh crore from the **secondary market** in the first quarter of 2021-22 to ease the bond markets. Yields of 10-year bond yields, that had floated around 5.90% prior to the Union Budget had shot higher past 6.20% since then, mainly due to the large central government borrowing of ₹ **12.03 lakh in FY22.**

What Is a Secondary Market?

- It is a place where the investors **buy and sell securities from other investors.** Examples of popular secondary markets are the National Stock Exchange (NSE), the New York Stock Exchange (NYSE), the NASDAQ, National Stock Exchange (NSE) and the Bombay Stock Exchange (BSE).
- This excessive liquidity was **dragging bond prices lower and pushing yields higher.**
- RBI hopes that with this purchase, yields on long term G-secs, which had spiked beyond 6 per cent in the last couple of months, will cool down.

Why was G-SAP required

Estimates of Bank of America Merrill Lynch

Centre's fiscal deficit	7.5% of GDP
1. Borrowing (a+b) (in ₹ crore)	17,60,900
a. Center	11,34,400
b. States	6,26,500
2. Total demand (c+d) (in ₹ billion)	12,58,900
c. Bank demand (net)	6,45,700
d. Others	6,13,200
3. RBI liquidity needed to balance G-Sec mkt (1-2) (in ₹ billion)	5,02,000
RBI OMO (@₹73.25/USD for FY22)	2,52,000
G-SAP	2,50,000

Source: RBI, FinMin, Bloomberg, CEIC

- The economy is seemingly recuperating from the pandemic, the RBI through its liquidity measures **also** wants to ensure that the **banks loosen their purse strings** and needy segments of the economy get credit at reasonable rates. **Their plan is to do this by TLTRO mechanism** to ensure to keep a check on the right amount of liquidity in the economy and keeping an eye over the growth too.

The **TLTRO or Targeted Long Term Repo Operation**, allows banks to borrow money from the RBI at the repo rate to lend to companies (**targeted sectors**) and NBFCs.

- But this time we are also observing an “**Operation Twist**”.The RBI is **buying up long-term government bonds and selling short-term ones** so that,**borrowing costs didn't go up.**

How does increased government borrowing affect government finances?

- The interest obligation on its past debt forms a big part of the government's fiscal deficit. If the government resorts to increasing its borrowings, more than what it has projected, then its interest costs also go up which may bring a higher fiscal deficit into the picture.

- It badly hurts the government's finances and its prospective investment plans. A larger borrowing programme increases its public debt. Also, during the current times when the GDP growth is subdued, **it will lead to a higher debt-to-GDP ratio.**

◎ CONCLUSION:

There seems a conflict between the RBI's role as inflation warrior and that as an expediter of government borrowings. So, the G-SAP programme is meant to ensure there's an 'orderly evolution of the yield curve', keeping in mind the present state of the economy which definitely requires cheaper money and the need of government which has to do the borrowing to manage its fiscal deficits. Dynamics of the character that RBI has to play as an in-charge of financial stability makes its job more challenging.

RBI FAVORS RETAINING 'CURRENT INFLATION TARGETING REGIME'

CONTEXT

In a recent report on currency and finance (RCF) for the year 2020-21, the Reserve Bank of India said “the current numerical framework for defining price stability, i.e., an inflation target of 4 per cent with a +/-2 per cent tolerance band, is appropriate for the next five years”.

◎ BACKGROUND

- In its first bi-monthly monetary policy review for FY 2021-22, the **Monetary Policy Committee (MPC)**, voted unanimously to keep the policy rate (repo rate) unchanged at 4%.
- This is the fifth time in a row where MPC has decided to maintain the status quo.
- The six-member MPC, headed by the RBI governor, decides on the monetary policy based on the **Flexible Inflation Targeting regime (FIT)**.
- The current Flexible Inflation Targeting regime (FIT) requires the RBI to keep **Consumer Price Index (CPI)** inflation maintained at the **4% ±2% level**.
- The current FIT regime was adopted in 2016 based on the **Urjit Patel report (2014)** on inflation and the use of inflation targeting.
- Earlier in March, the **government had decided to extend** the current Flexible Inflation Targeting (FIT) regime **for the next five years**, starting April 1, 2021.

Monetary Policy

- Monetary policy refers to the policy of the RBI with regard to the use of **monetary instruments** under its control **to achieve certain goals** regarding the economy of the nation.
- The primary objective of monetary policy is to **maintain price stability** while keeping in mind the **objective of growth**.
- RBI is vested with the responsibility of conducting monetary policy. This responsibility is explicitly mandated under the **Reserve Bank of India Act, 1934**.

Instruments of Monetary Policy

Several direct and indirect instruments are used for implementing monetary policy:

- **Liquidity Adjustment Facility (LAF):** This tool allows banks to borrow money through **repurchase agreements (repos)** or for banks to make loans to the RBI through reverse repo agreements.
- **Statutory Liquidity Ratio (SLR):** The share of Net demand and time liabilities (NDTL) that a bank is required to maintain in safe and liquid assets, such as unencumbered government securities, cash, and gold. Changes in SLR often influence the availability of resources in the banking system for lending to the private sector.
- **Open Market Operations (OMOs):** These include both, outright purchase and sale of government securities, for injection and absorption of durable liquidity, respectively.
- **Repo Rate:** The (fixed) interest rate at which the RBI provides overnight cash to banks against the collateral of government and other approved securities under the liquidity adjustment facility (LAF).
 - The current Repo rate is 4%.
- **Bank Rate:** It is the rate at which the central bank is ready to buy or rediscount commercial papers. This rate has been aligned to the MSF rate and, therefore, changes automatically as and when the MSF rate changes alongside policy repo rate changes.
- **Cash Reserve Ratio (CRR):** The average daily balance that a bank is required to maintain with the RBI as a percentage of its NDTL notified by RBI.
 - The current CRR is 3%

◎ ANALYSIS

Understanding India's Monetary Policy framework

- In 2016, the **Reserve Bank of India Act, 1934** was amended to provide a statutory basis for the

implementation of the **flexible inflation targeting (FIT)** framework (described in the background section).

- The framework aims at setting the policy (repo) rate based on an assessment of the current and evolving macroeconomic situation.
- Changes in the **Repo rate transmit** through the **money market** to the entire financial system, which, in turn, influences **aggregate demand** – a key determinant of inflation and growth.

A brief history of monetary policy framework in India

- Till Bretton Woods System (i.e. early 1970s) value of money was linked with Gold – so monetary policy had a secondary role since under a fixed exchange rate there is very little scope for monetary policy.
- However, after the breakdown of the **Bretton Woods system** – Monetary policy framework evolved in India.
 - **1st phase of evolution (1985 to 1998): Total money supply as a target** - Deepening of financial markets in India helped develop direct linkage between money supply and final objectives of price and output stability.
 - **2nd phase of evolution (1998 to 2015): Multiple indicators approach** - As liberalization of the economy since the early 1990s and financial innovations began to undermine the efficacy of the prevalent monetary targeting framework, a need was felt to review the monetary policy framework. As a result, the RBI adopted multiple indicators approach in April 1998.
 - **3rd phase - Current system (2016 onwards): Flexible Inflation Targeting**- In the post-global financial crisis period (i.e., post-2008), the credibility of multiple indicator framework came into question as persistently high inflation and weakening growth began to co-exist. This led to the establishment of the **Urjit Patel committee**, which recommended an inflation-targeting approach for monetary policy in its report in 2014. The FIT was adopted in 2016.
- Thus, it is evident that India's monetary policy framework is a continuously evolving process contingent upon the-
 - level of development of financial markets and institutions
 - the degree of global integration

Monetary Policy Committee

- The amended RBI Act, 1934 also provides for

an empowered **six-member monetary policy committee (MPC)** to be constituted by the Central Government.

- The six members include - **three officials of the RBI** and **three external members** nominated by the Government of India.
- The frequency of the Monetary Policy Committee (MPC) meeting is set at six times per year, in line with most of the developed countries.
- The MPC determines the policy interest rate (i.e. repo rate) required to achieve the inflation target (ie.4% ±2%).
- Decisions are taken by the **majority** and the Governor has the casting vote in case there is a tie.

Why is there a debate around the Flexible Inflation Targeting (FIT) regime?

• Benefits of Inflation Targeting

- Enhances **Transparency, Clarity,** and **Predictability** of Monetary policy
- Low and stable inflation is a prerequisite for **sustainable growth** for a country like India
- An explicit target like this helps RBI in maintaining its **autonomy and accountability**
- **Empirical evidence** from other countries has indicated that inflation targeting helps in achieving greater macro-economic stability.

• Challenges in Inflation targeting:

- The sole focus on inflation **undermines RBI other targets** like growth and financial stability
- There has been **no empirical evidence** of a clear linkage between Low inflation and financial stability.
- In India, inflation is usually dominated by **Supply-side** bottlenecks (like poor agricultural production due to irregular monsoon. Under such a situation, monetary policy will have a limited role in easing the inflation
- Inflation targeting is more suited for developed countries with good monetary policy transmission. Since the **transmission is poor in India**, it leaves inflation targeting policies virtually ineffective.

◎ CONCLUSION

The need of the hour is an effective fiscal and monetary interface with responsible and functional autonomy to the RBI. In these challenging times, the need is to tinker not with inflation targeting, but to allow the RBI autonomy with less fiscal dominance.

ETHICAL ISSUES IN BIOTECHNOLOGY

CONTEXT

Globally, there has been rapid growth in the field of biotechnology that has the potential to impact various aspects of people's lives. At the same time, however, these technologies present unique regulatory and bioethical conundrums.

◎ BACKGROUND

- During the **course of technological maturity**, various technologies often **challenge existing ethical and regulatory norms**, primarily due to their novelty. Biotechnology is one of them.
- It is difficult to regulate the technology at this stage because their broader implications on health, the environment, and national security are yet to be fully understood.
- Regulatory apparatuses however will eventually have to catch up and a new equilibrium is to be established. In this regard, we will delve into details of various ethical conundrums surrounding biotechnology.
- We shall **examine two of the most promising advances** in the field of biotechnology: the CRISPR/Cas9 gene-editing system, and artificial gene synthesis technology.

◎ ANALYSIS

CRISPR/Cas9 Gene Editing Technology

- The CRISPR is an acronym for **Clustered Regularly Interspaced Short Palindromic Repeats**.
- It is a less than a decade-old gene-editing technology that has revolutionized the field of medical research and biotechnology owing to its efficiency, simplicity, and cost-effectiveness.
- Working of the CRISPR/Cas9: It finds the target DNA sequence in the cell and performs desired edits to the gene sequence, all by itself.

Concerns regarding CRISPR:

- Germline Editing concerns:** Germline Editing involves making genetic modifications to human embryos and reproductive cells (sperms/ egg cells). The changes made in the germline are passed on to the subsequent generation. Thus, the use of CRISPR technology in the process raises Ethical concerns like should the unborn child not have a say in decision making of how they want their future to look like.
- Biosafety Concerns:** CRISPR, in the wrong hands, could bring in new dangers. It can be used to make dangerous pathogens more potent. An accidental or deliberate release of genetically engineered

microorganisms or viruses into the environment is also a cause of major concern.

- Ecological dis-equilibrium:** As genetically engineered or modified organisms are introduced, they can reduce the genetic diversity of the targeted population. As this organism can spread to other populations through cross-breeding, it can also affect the genetic diversity of these populations. Eg. BT Cotton can crossbreed with other varieties of Cotton and change their genetic composition.
- Regulatory Bypass:** CRISPR has brought into the market a new way to produce genetically engineered crops. Using CRISPR technology, there is no need to insert foreign DNA in a plant to make the required changes. Hence, the plant would not be classified as transgenic. This will help in bypassing regulations controlling the use of GM crops.

Ethical issues involved:

- Safety:** It becomes a primary concern due to the possibility of
 - off-target effects (edits in the wrong place) and
 - mosaicism (when some cells carry the edit but others do not)
- Informed Consent:** As the long-term impact of germline therapy remains unknown, obtaining truly informed consent from prospective parents is not possible. It has also been argued that the person directly affected, ie. the child (embryo), has no way of providing consent.
- Justice and Equity:** Genome editing, like many other new technologies, is accessible mainly to rich people in society. This has the potential to increase existing disparities in access to healthcare and other interventions.



Challenges and Opportunities with CRISPR/Cas9

Artificial Gene Synthesis (AGS) Technology

- Artificial gene synthesis is the chemical synthesis of a DNA sequence that represents one or more genes.
- The technology broadens the scope of biological experiments by providing a method to efficiently produce long stretches of natural and non-natural nucleic acid sequences.
- This technology provides several advantages during the research and development process. Gene synthesis is used to make custom plasmid optimize gene expression, produce recombinant antibodies, study mutant genes, and even design and synthesize DNA vaccines

Difference between Synthetic Biology and Genome Editing

- Synthetic biology, to an extent, is similar to genome editing because both involve changing an organism's genetic code. However, there is a distinction between these two approaches based on how that change is made.
- In synthetic biology, scientists typically stitch together long stretches of DNA and insert them into an organism's genome. These synthesized pieces of DNA could be genes that are found in other organisms or they could be entirely new.
- But in genome editing, scientists typically use tools to make smaller changes to the organism's DNA. Genome editing tools can be used to delete or add small stretches of DNA in the genome.

Ethical issues involved:

- **Playing God!:** AGS will enable humans to create life from non-living, inorganic matter. Indeed a role played by God till now. The concern is that humans fail to recognize their limitations, for example, by overestimating their ability to control complex ecosystems. Introducing structurally deep chemistry changes in DNA within living systems could generate unpredictable and possibly lethal outcomes by allowing natural selection to proceed through a competition between current life forms and new ones using modified genetic codes.
- **Organisms or machines?:** A unique ethical concern about synthetic biology is that it may result in the creation of entities that fall somewhere between living things and machines.

- **Misuse of knowledge:** The accessibility and advantages of this technology make it a potentially attractive instrument, for example, for bioterrorism.
- **If there's human error, then who will be liable?:** For example, concerns have been made that the SARS CoV2 virus which has brought the COVID pandemic was a result of an accidental leak of a genetically edited virus from a laboratory.

WAY FORWARD**Balancing Alarmism and Regulation**

- Ethical standards for research and development (R&D) activities are usually enforced through legislation or guidelines issued by national governments.
- So, the challenge before government policymakers is to develop regulations that do not stifle innovation and protect scientific freedom, while ensuring enough checks and balances to minimize risks posed by the misuse.
- **For example:**
 - Both technologies have been at the forefront of tackling the Covid-19 pandemic. mRNA vaccines have used both these technologies. This shows the usefulness of these technologies.
 - Extremely restrictive regulations would have added more months to the vaccine development process—something that the world could not afford.
- The scientific community also bears a special responsibility to:
 - uphold the highest standards of biosafety and ethical probity
 - minimize incidents of misuse and negligence as they can negatively affect public perception and hamper growth prospects of the emerging technology

CONCLUSION

Policymakers should take an approach that involves regular deliberations between scientists, civil society, and the private sector. This can be more beneficial than resorting to ad-hoc regulatory arrangements.

Scientists and researchers must always keep in mind Gandhi's one of the seven sins, i.e., Science without humanity is a sin. Without humanity, science has the potential to cause great harm. Humanity at the heart of science will make the world a better place.



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INTERNATIONAL QUIET OCEAN EXPERIMENT (IQOE)

◎ CONTEXT:

- In the latest development, scientists have come together to understand the impact of reduced anthrophony (human-made sounds) due to the COVID-19 pandemic on the marine ecosystem.
- In this regard, the International Quiet Ocean Experiment (IQOE) has identified a network of over 200 non-military hydrophones (underwater microphones) in oceans across the world.

◎ ABOUT:

What is oceanic acoustics?

- Ocean acoustics refers to the study of sound and its behavior in the waters.
- When underwater objects vibrate, they create sound-pressure waves that alternately compress and decompress the water molecules as the sound wave travels through the sea.
- Sound waves radiate in all directions away from the source like ripples on the surface of a pond.
- The compressions and decompressions associated with sound waves are detected as changes in pressure by the structures in our ears and most man-made sound receptors such as a hydrophone, or underwater microphone.
- **Components:** The three broad components of oceanic acoustics are
 - **geophony** (sounds created by non-biological natural events like earthquakes, waves, and bubbling),
 - **biophony** (sounds created by the ocean's living creatures)
 - **anthrophony**

How will it be done?

- The underwater microphones would pick up even faraway low-frequency signals from whales and other marine animals, as well as those emanated by human activities.
- The researchers will do a comparative study of this quantitative picture of the **ocean acoustics** and other sets of data on marine life collected through methods such as **animal tagging**.
- This will help them understand how the soundscape of the oceans is changing and how it impacts marine life.

International Quiet Ocean Experiment

- The International Quiet Ocean Experiment was originally formed in 2011 by experts who wanted to create a time series of measurements of ambient sound in different ocean locations.
- The main aim behind the initiative was to reveal variability and changes in intensity and other properties of sound at a range of frequencies.
- Then 2020 came along, and presented a unique – and potentially unrepeatable – opportunity to compare ocean soundscapes in 'business-as-usual' and 'quiet mode'.

A 3000-YEAR-OLD 'LOST GOLDEN CITY' DISCOVERED IN EGYPT

◎ **CONTEXT:** In the latest development, Egyptian archaeologists have discovered a "lost golden city" in Egypt that dates back to the 14th century B.C.

◎ **ABOUT:** What is the "lost golden city"?

- The 3,000-year-old city near Luxor is known as "**The Rise of Aten**" and the largest city ever found in Egypt.
- The city is thought to belong from the era of **18th-dynasty king Amenhotep III (1391 to 1353 B.C.)**.
 - The city is also considered to have been used by **Tutankhamun** and his successor Ay during a period believed to be the golden era of ancient Egypt.
 - It is considered the **largest administrative** and **industrial settlement** of the pharaonic empire.
- **Location: West Bank** of the **Nile River**, close to the Colossi of Memnon, Medinet Habu, and the Ramesseum, or mortuary temple of King Ramses II.
- **Architecture:** The city is fenced in by a zigzag wall. It has only one access point leading to internal corridors and residential areas.

Zigzag walls are one of the rare architectural elements in ancient Egyptian architecture which were mainly used at the end of the 18th Dynasty.

- The **northern part of the city** includes the administrative and residential districts and in the **southern part** workshops, bakery, oven, and pottery storage are found.
- **Houses** are made up of **mud-bricks**.
 - Some mud bricks have the seal of Tutankhamun's grandfather King Amenhotep III, who is known to be one of Egypt's most powerful pharaohs.
- **Other findings:** The artifacts and tools were also discovered from the reign of the Pharaohs.
 - The site has also seen a **large number of ovens and kilns** for making glass and faience.
 - The **clay caps of wine vessels, rings, scarabs, colored pottery, and spinning and weaving tools** were also found.
 - Two **burials of a cow or bull** are also found inside one of the rooms.
 - The **burial of a person** with arms outstretched to his side and remains of a rope wrapped around his knees is also found.

Significance of the finding

- The discovery will shed light on one of history's greatest mystery that is why did **Akhenaten** and **Nefertiti** decide to move to Amarna.
- Amarna is an extensive Egyptian archeological site that represents the remains of the newly established capital city in 1346 B.C.

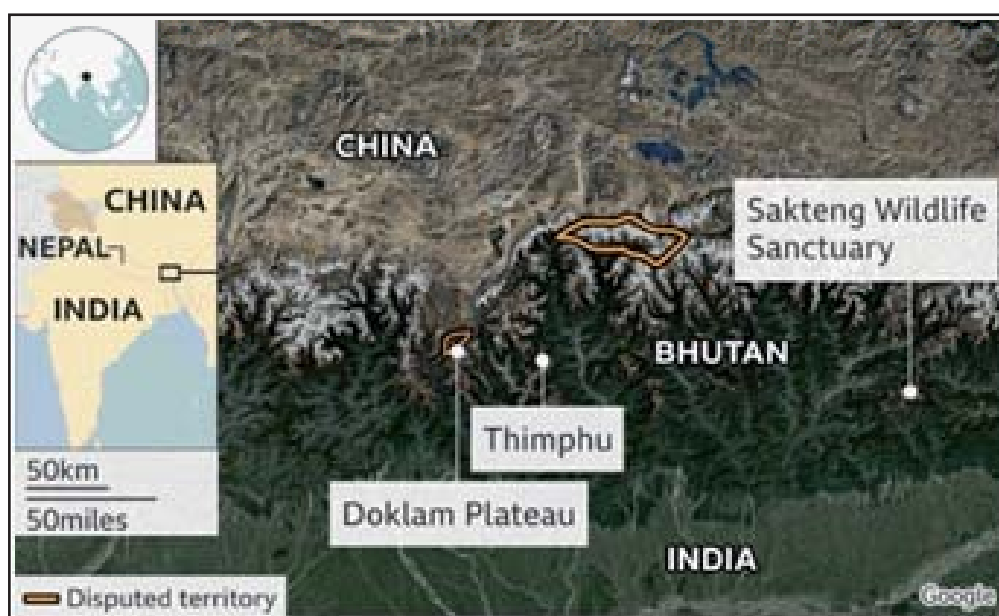
Tutankhamun (c. 1342 – c. 1325 BC)

- Commonly referred to as **King Tut**, he was the last of his royal family to rule during the end of the **18th Dynasty Egyptian pharaoh**.
- His father was the pharaoh Akhenaten.

CHINA-BHUTAN BOUNDARY TALKS

◎ **CONTEXT:** In the latest development, China and Bhutan have agreed to continue to maintain peace and stability in the border areas before the final settlement of their boundary issues.

- ◎ **ABOUT:** **The Dispute**
- Bhutan shares over a 400-km-long border with China and the two countries have held 24 rounds of boundary talks in a bid to resolve the dispute.
 - The Boundary Talks between Bhutan and China began in 1984 and both countries have signed
 - the Guiding Principles on the Settlement of the Boundary Issues in 1988
 - the Agreement on Maintenance of Peace and Tranquillity along with the border areas in 1998
 - These two agreements form the basis of the boundary negotiation between Bhutan and China.



India's stake in the region

- India maintains close ties with the tiny Himalayan neighbor.
- **Doklam**, an area close to the India-Bhutan-China tri-junction, had witnessed a standoff between Indian and Chinese armies.
- The area is of strategic importance to all three nations.

India-China border dispute

- The India-China border dispute covers the 3,488km-long Line of Actual Control (LAC).
- The two sides have held 22 rounds of Special Representatives-level talks so far to resolve the boundary dispute.
- The meeting took place in the backdrop of the military standoff between China and India in eastern Ladakh since May last year.

E9 INITIATIVE OF 'SCALING UP DIGITAL LEARNING TO ACCELERATE PROGRESS TOWARDS SDG4

◎ **CONTEXT:** Minister of State for Education, Shri Sanjay Dhotre participated in the consultation meeting of Education Ministers of E9 countries on the E9 initiative: Scaling up digital learning to accelerate progress towards SDG4.

◎ **ABOUT:** **What is E9?**

- E9 Countries include Bangladesh, Brazil, China, Egypt, India, Indonesia, Mexico, Nigeria, and Pakistan.
- It was first established in 1993.
- Mobilizing the full potential of the E9 Partnership is therefore vital for the achievement of SDG4 – Education 2030.
- The initiative aims to accelerate recovery and advance the Sustainable Development Goal 4 agenda by driving rapid change in education systems in three of the 2020 Global Education Meeting priorities:
 - support to teachers
 - investment in skills
 - narrowing of the digital divide

Indian initiatives in the education sector

- India has extensively made use of digital tools to take education to the remotest part of the country:
 - One Nation-One Digital Platform –DIKSHA
 - One Nation-One Channel program of -SWAYAM PRABHA
 - SWAYAM MOOCs
 - radio broadcasting
 - PM e-VIDYA
- India Government is also setting up **National Digital Education Architecture** to deliver a 'digital first' approach to support teaching and learning.

ANAMAYA: TRIBAL HEALTH COLLABORATIVE

◎ **CONTEXT:** In a positive development, the Government launched the Tribal Health Collaborative 'Anamaya'.

◎ ABOUT:

- Anamaya aims at enhancing the health and nutrition eco-system of the tribal communities of India.
- It further aims to build a sustainable, high-performing health eco-system to address the key health challenges faced by the tribal population of India.
- **Nodal Ministry:** It is a multi-stakeholder initiative which is launched by the **Union Health Ministry** in collaboration with the **Union Minister of Tribal Affairs**.
- The other collaborative includes the Bill and **Melinda Gates Foundation (BMFG)** and **Piramal Foundation**.

Implementation:

- The **National Council on Tribal Health** along with the **Tribal Health Cell** will be set up to monitor healthcare needs in the tribal areas as well as implement the **Tribal Health Action Plan**.
- Need of such initiative
- Despite the improvement over the years, the tribal population disproportionately shares the burden of poverty, death, and diseases compared to their non-tribal counterparts and faces a myriad of obstacles when accessing public health systems.
- These include the
 - lack of health facilities in indigenous communities
 - cultural differences with the health care providers
 - human resource shortages
 - poor treatment-seeking behavior
 - difficult terrain
 - infrequent transport

Other similar initiatives

- **Tribal Tuberculosis** Initiative was launched by both the Ministries to fulfill the goal of 'TB Mukht Bharat' by 2025, five years ahead of the global deadline.

RBI NOT IN FAVOR OF SUPERVISING NUES

◎ CONTEXT:

The Reserve Bank of India (RBI) seems to be not in favor of getting direct and supervisory management over the New Umbrella Entities (NUE). However, the central bank seems to be in favor of the National Payments Corporation of India (NPCI) or a newly fashioned physique to take over the function.

◎ ABOUT:

What are New Umbrella Entities (NUEs)?

- New Umbrella Entities shall be non-profit entities.
- It shall be a Company incorporated in India under the **Companies Act, 2013**, authorized by the **Reserve Bank of India (RBI)** under **Section 4 of the PSS Act, 2007**.
- As per the RBI rules, no single promoter can have over 40 percent stake in the NUE. Further, the percent of stake has to be reduced to less than 25 percent within five years of operation.

- Foreign investment is allowed in NUEs as long as they comply with the existing guidelines.
- Entities that are owned and controlled by Indian citizens with at least three years of experience in the payments sector can become promoters of NUEs.

Key-functions

- The **pan-India umbrella entity** would focus on retail payment systems.
- Furthermore, it will help in setting up and management of a new payment system.
- It will work especially for retail such as ATMs, white-label PoS, Aadhaar-based payments, and remittance services.
- NUEs will develop new payment methods, standards, and technologies for the operation and clearance of **settlement systems**.

The previous structure

- Earlier, NPCI was working as the umbrella entity for providing retail payments system.
- But due to its task burden, it was decided to set up new umbrella entities for retail payment.

About NPCI

- NPCI is an umbrella organization for retail payments and settlement systems in India.
- It is an initiative of the Reserve Bank of India (RBI) and Indian Banks' Association (IBA) under the provisions of the Payment and Settlement Systems Act, 2007.
- It has been incorporated as a "Not for Profit" Company under the provisions of Section 25 of Companies Act 1956 (now Section 8 of Companies Act 2013).

Important initiatives of NPCI

- **RuPay:** RuPay is an indigenously developed Payment System.
- **IMPS:** With the help of Immediate Payment Service (IMPS), India has become one of the leading countries in the world in real-time payments in the retail sector.
- **NACH:** National Automated Clearing House (NACH) is an offline web-based system for bulk push and pull transactions.
- **ABPS:** Aadhaar Payment Bridge (APB) System is helping the Government and Government agencies in making the Direct Benefit Transfers in various Central as well as State sponsored schemes.
- **AePS:** To access the funds at the doorstep & drive financial inclusion in India, the Aadhaar enabled **NFS:** National Financial Switch (NFS) is the largest network of shared Automated Teller Machines (ATMs) in India that facilitates interoperable cash withdrawal, card to card funds transfer, and interoperable cash deposit transactions among other value-added services in the country.
- **UPI:** Unified Payments Interface (UPI) has been termed as the revolutionary product in the payment system.
- **Bharat Bill Payment System:** Bharat Bill Payment System is offering a one-stop bill payment solution.
- **NETC:** National Payments Corporation of India (NPCI) has developed the National Electronic Toll Collection (NETC) program for meeting the electronic tolling requirements of the Indian market.

KEN-BETWA LINKING PROJECT

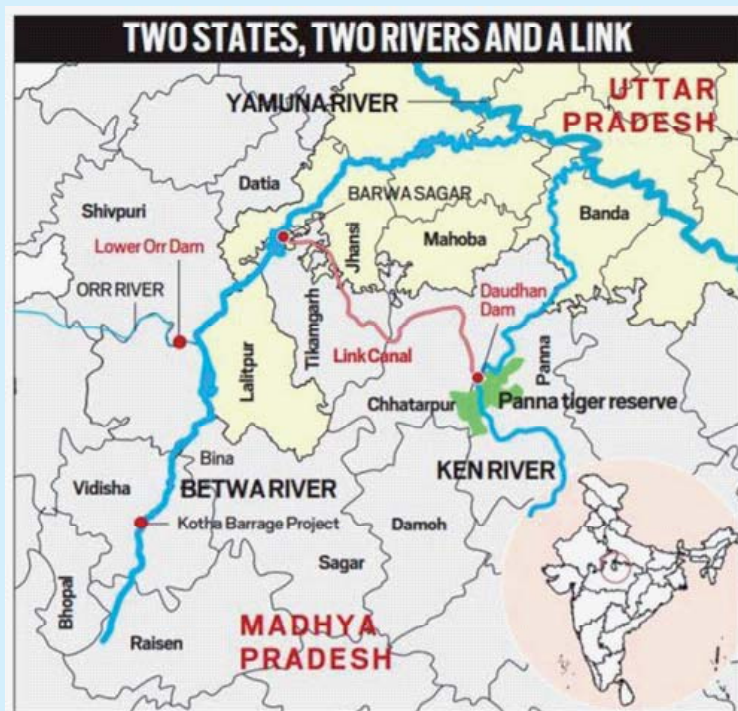
◎ **CONTEXT:** About four decades after conceptualisation, India's first river interlinking project, connecting Ken river in Madhya Pradesh with Betwa in Uttar Pradesh, is finally set to get off the drawing board. However, some issues still remain unaddressed.

◎ **ABOUT:** What is the Ken Betwa Link Project?

- It is the first project under the **National Perspective Plan for interlinking of rivers**.
- Under this project, water from the **Ken river** will be transferred to the **Betwa river**. Both these rivers are tributaries of river Yamuna.
- The Ken-Betwa Link Project has two phases.
 - **Phase-I**, one of the components — Daudhan dam complex and its appurtenances like Low Level Tunnel, High Level Tunnel, Ken-Betwa link canal and Power houses — will be completed.
 - **Phase-II**, three components — Lower Orr dam, Bina complex project and Kotha barrage — will be constructed.
- The Project lies in Bundelkhand, a drought-prone region, which spreads across 13 districts of Uttar Pradesh and Madhya Pradesh.

Bundelkhand region

- Bundelkhand region is surrounded a number of rivers of the **Ganga-Yamuna river basin**.
 - ▶ The Yamuna river is to the North of Bundelkhand
 - ▶ Ken river is in the east
 - ▶ Betwa and Pahuj rivers are in the west
- Yamuna river flows from west to east and is fed by its tributaries from Bundelkhand region— the **Betwa, Ken, Pahuj, Baghain, and Paisuni**.



What issues still remain?

KEN-BETWA LINKING: WHAT'S AT STAKE	
₹35,000 CR PROJECT COST	
HOW IT WILL BENEFIT PEOPLE	CHALLENGES THE PROJECT FACES
<ul style="list-style-type: none"> Area of land to be irrigated by it: 1.06 million hectares Number of people it will provide drinking water to: 6.02 million Power it will generate: 103 Mw 	<ul style="list-style-type: none"> Area to be submerged: 4,000 hectares(10 villages) Project doesn't have the final forest clearance Experts feel local irrigation should be exhausted before such a project is started

Significance of the project

- The project is expected to provide-
- annual irrigation of 10.62 lakh hectares
- drinking water supply to about 62 lakh people
- generate 103 MW of hydropower

Other river-linking projects in India

- Periyar Project
- Parambikulam Aliyar
- Kurnool Cudappah Canal
- Telugu Ganga Project
- Ravi-Beas-Sutlej

TIGER RELOCATION PROJECT FAILS

◎ CONTEXT:

Sundari, a tigress shifted as part of India's first inter-state translocation project in 2018 from Madhya Pradesh to Odisha, returned home, signifying failure of India's first inter-state tiger relocation project.

◎ ABOUT:

What was the Tiger Relocation Project?

- The tiger relocation project was initiated in 2018.
- Under the plan, two big cats, a male (Mahavir) from **Kanha Tiger Reserve** and a female (Sundari) from **Bandhavgarh** from Madhya Pradesh were relocated to **Satkosia Tiger Reserve** in Odisha, to shore up the tiger population in the state.
- Sundari was brought to Satkosia a week after Mahavir's arrival.

Satkosia Tiger Reserve

- Encompassing an area of 963.87 sq km, the Satkosia Tiger Reserve spreads across four districts and has as its core area 523 sq km.
- Declared as a **Tiger Reserve** in 2007, Satkosia had a population of 12 tigers then. The numbers reduced to two in 2018.
- The purpose of the relocation was to repopulate tigers in the reserve areas.

Purpose of the project

- The relocation was meant to serve two purposes —
 - to reduce tiger population in areas with excess tigers to majorly reduce territorial disputes
 - to reintroduce tigers in areas where the population has considerably reduced due to various reasons

Factors contributed to the likely failure of the project

- lack of confidence and trust building between the forest department and the villagers
- human-animal conflict
- Poor capacity for tiger monitoring
- Poor protection

ALGORITHM FOR ADITYA L1 MISSION

◎ **CONTEXT:** A novel algorithm for tracking the very fast accelerating Coronal Mass Ejections (CMEs) has been developed by a group of researchers under the lead of Aryabhata Research Institute of Observational Sciences (ARIES).

◎ **ABOUT:** The novel algorithm CIISCO

- The newly developed algorithm is named **CME Identification in Inner Solar Corona (CIISCO)**.
- It was jointly developed along with scientists from the Royal Observatory of Belgium.
- It can track bubbles of gaseous matter associated with magnetic field lines ejected from the Sun's inside.
- The newly developed algorithm has been successfully tracked these accelerating solar eruptions in the lower corona.
- **Significance:** It would help as a foundation in planning research of the lesser-known lower corona region of the Sun using **Aditya L1**.

Coronal Mass Ejection (CME)

- It is a significant release of plasma and accompanying magnetic field from the **solar corona**.
- These ejections follow **solar** flares and are normally present during a **solar** prominence eruption.
- The plasma is released into the **solar** wind.

The need

- Due to limited technology of satellite and ground-based observatories in acquiring observations of CMEs from within the Sun's interiors was difficult.
- Space environment, Weather, and climate around Earth are governed by the Sun.
- CMEs and the solar flares, solar energetic particles, high-speed solar winds pose a serious threat to most of Earth's space-based services along with the Global Positioning System (GPS), radio, and satellite-based telecommunication and can cause power grid failure.

Aditya - L1

- The Aditya-1 mission India's first mission to study the Sun.
- The Aditya-1 mission is a 400kg class satellite carrying one payload, the Visible Emission Line Coronagraph (VELC).
- It was planned to launch in 800 km low earth orbit and now will be inserted in a halo orbit around the L1, which is around 1.5 million km from the Earth.
 - ▶ A Satellite that is placed in the halo orbit around the Lagrangian point 1 (L1) of the Sun-Earth system will have the major advantage of continuously viewing the Sun without any occultation/ eclipses.
- Aditya-1 was meant to observe only the solar corona.
- The outer layer of the Sun which extends to thousands of km above the disc (photosphere) is termed the corona (6000K)

GOVERNMENT LAUNCHES NANOSNIFFER EXPLOSIVE TRACE DETECTOR

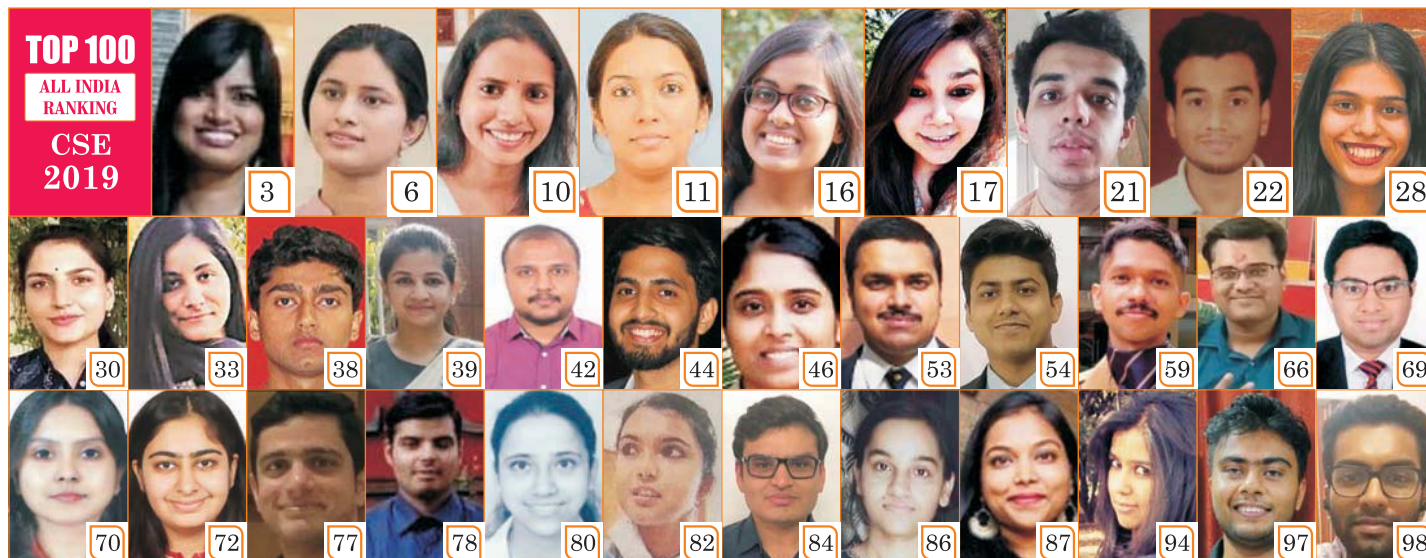
◎ CONTEXT:

The Ministry of Education launched NanoSniffer, a Microsensor based Explosive Trace Detector (ETD) which is developed by NanoSniff Technologies, an IIT Bombay incubated startup.

◎ ABOUT:

What is the Nanosniffer?

- Nanosniffer is the world's first **Explosive Trace Detector** by using microsensor technology.
- **Indigenous:** NanoSniffer is a 100% **Made in India** product in every terms starting from research and development to its manufacturing.
- **Type of material:** It detects all classes of military, conventional and homemade explosives.
- NanoSniffer gives visible & audible alerts with sunlight-readable color display.
- **Patent:** The core technology of NanoSniffer is patented in the U.S. & Europe.
- How will it benefit?
- NanoSniffer provides trace detection of a nano-gram quantity of explosives & delivers result in seconds.
- This Home-grown Explosive trace detector device (ETD), NanoSniffer can detect explosives in less than 10 seconds.
- The newly developed device would help in reducing our dependency on imported explosive trace detector devices.
- It will also encourage indigenous institutions, startups and medium-scale industries to research & develop products. It's a perfect example of lab to market product.



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