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MINISTRY OF SCIENCE AND TECHNOLOGY



MK Yadav Sir

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BIOE3 POLICY

(Syllabus: GS Paper 3 – Sci and Tech)

Harnessing biotechnology for economic development



AMITABH SINHA

THE CENTRE unveiled its BioE3 (Biotechnology for Economy, Environment and Employment) policy last week. On the face of it, the policy appears to be a routine attempt to create incentives and opportunities to energise growth in the biotech sector. But it is, in fact, about transforming existing industrial and manufacturing processes across various sectors to make them more sustainable and environment-friendly, and less wasteful.

The policy seeks to achieve this by harnessing the power of biotechnology, and developing new manufacturing methods that replicate, or mimic, processes found in natural biological systems. Government officials are calling it the first step towards the industrialisation of biology, which can have profound impacts on the economy.

What are biotech's potential benefits?

Biotechnology, the science of manipulating biological organisms and processes to develop desired products or applications, is a vast and diverse field. It includes areas such as genomics, genetic engineering, synthetic biology, bioinformatics, gene therapy, etc.

Knowledge in these areas has been used to find cures for genetic disorders or develop new varieties of plants that, for example, have special desirable traits. So far, biotechnology-based solutions have been applied largely in the fields of medical science and agriculture.

However, recent breakthroughs in gene editing technologies, protein synthesis, or the ability to grow specific enzymes using genetically modified microorganisms, coupled with increased data processing capabilities and the use of artificial intelligence, have opened up new possibilities for biotechnology.

Traditional products such as synthetic clothes, plastics, meat or milk, and fuel can have more environment-friendly alternatives, produced using modern biology. Similarly, several chemical processes in the industry can be replaced by organic and less polluting biological processes.

For example, animal-free milk, which is the same in taste, texture, and nutritional benefits as natural milk, can be produced using a process called precision fermentation. There are benefits in terms of lower carbon footprint, greater access, higher nutritional value, and increased supply.

Chemically produced traditional plastics, which are a major environmental hazard, can be substituted by a range of bioplastics such as polylactic acid that are biodegradable. These bioplastics are made from renewable and recyclable biological materials like corn starch or sugarcane, and not from hydrocarbons that are the source for traditional plastics.

Micro-organisms such as some kinds of bacteria and algae can also be used for capturing carbon dioxide from the atmosphere, a critical bioprocess in times of climate change. Different versions of existing carbon capture and storage technologies, based on chemical processes, have remained unviable for many reasons, including high costs and the fact that they involve burying the captured CO2 in geological formations below the Earth for an indefinite period. Biological processes involving micro-organisms break down CO2 into other useful compounds, including biofuels, thus negating the need for storage.

EXPLAINED POLICY

In the field of synthetic biology, novel organisms with specific characteristics or biochemicals like proteins and enzymes can be designed from scratch to perform desired functions. Using a process called organogenesis or organ engineering, organs can be grown in laboratories. This can eliminate the dependence on donors for organ transplants.

The potential of biotechnology is just beginning to unfold. While some alternatives like animal-free milk are already commercially available in a few markets, most of the technologies are still under development. They may be facing scalability, financial or regulatory hurdles as of now.

How can BioE3 policy benefit India?

In a few years, these technologies are expected to transform the economy and existing processes.

Biomanufacturing — the use of biological organisms or processes in industrial production of goods and materials — alone is expected to have an economic impact worth $2-4 trillion over the next decade, according to government estimates. Biomanufacturing is just one part of the greater integration and reliance on biology in economic processes.

The BioE3 policy is thus an attempt to prepare India for the future. The policy is unlikely to yield any economic dividend in the near term. But the idea is to build competencies, promote research, educate and train young talent, and get involved in the process of technology development so that India can be well-placed to derive benefits when the technologies become mature.

In this regard, the BioE3 policy is similar to several other recent government initiatives in the science and technology sector. The Artificial Intelligence Mission, the Quantum Mission, and the Green Hydrogen Mission are attempts to enable India to develop and harness futuristic technologies that are expected to soon become the backbone of the global economy, and help solve critical issues like climate change and energy security.

The BioE3 policy envisages the setting up of several biomanufacturing hubs across India. At these hubs, industry partners and start-ups can establish facilities for producing specialised chemicals, smart proteins, enzymes, functional foods, and other bio-products and services.

The hubs will focus on six areas — bio-based chemicals and enzymes, functional foods and smart proteins, precision biotherapeutics, climate resilient agriculture, carbon capture and utilisation, and futuristic marine and space research.

The last is aimed at developing products such as life support systems for astronauts that recycle waste in space and produce oxygen and food. This is done by growing special plants or micro-organisms like algae in space habitats.

Research on marine ecosystems could result in the biomanufacturing of novel compounds and enzymes produced by marine organisms. They can have useful applications in areas such as pharmaceuticals or cosmetics.

The BioE3 policy is being piloted by the Department of Biotechnology but its impact is so widespread that at least 15 different government departments, or more, need to collaborate for successful implementation.

Context: The Centre introduced its BioE3 policy, designed to stimulate growth in the biotech sector through new incentives and opportunities. Initially, the policy appears to be a conventional approach to enhancing biotechnology's impact on the economy, environment, and employment.

BioE3 (Biotechnology for Economy, Environment and Employment) Policy

- **About:** The BioE3 Policy primarily concentrate on the following strategic sectors: high- value bio-based chemicals, biopolymers & enzymes; smart proteins & functional foods; precision biotherapeutics; climate resilient agriculture; carbon capture & its utilization; marine and space research.
- **Objective**: The policy aims to promote high-performance **biomanufacturing.**
- **Focus:** This involves producing diverse products, addressing farming and food challenges, and advancing bio-based manufacturing through advanced biotechnology.
- **Key features of Bio E3:**
  - The BioE3 policy's key aspects involve supporting innovation-driven R&D and entrepreneurship across various thematic sectors.
  - In general, this Policy will bolster the Government's initiatives such as 'Net Zero' carbon economy & 'Lifestyle for Environment' and will guide India towards accelerated 'Green Growth' by encouraging 'Circular Bioeconomy'.
  - The BioE3 Policy will nurture an advanced future that is more sustainable, innovative, and responsive to global challenges and sets out the Bio-vision for Viksit Bharat.

Benefit for India

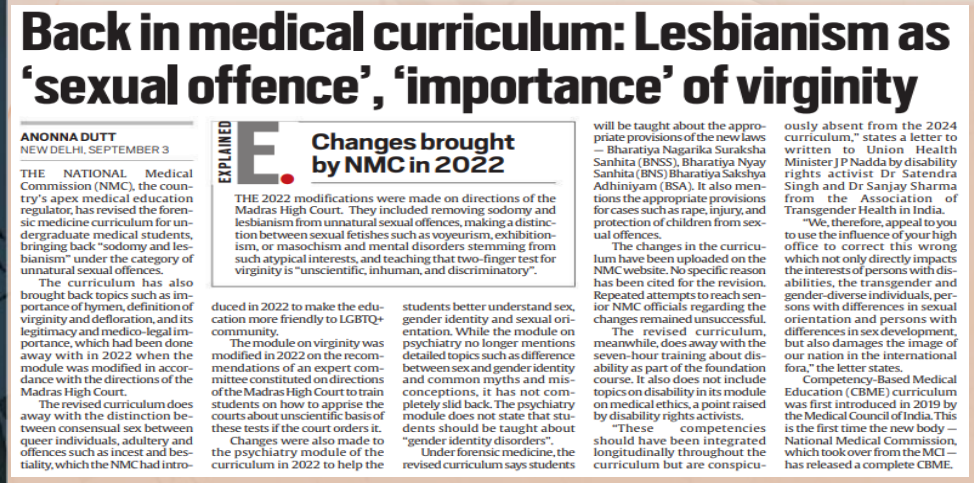
- **Biomanufacturing Impact:** The BioE3 policy supports biomanufacturing, which is projected to contribute $2-4 trillion to the economy over the next decade.
  - **Biomanufacturing** refers to the use of cells or other living microorganisms to produce commercially viable products.
- **Strategic Preparation**: The policy aims to build competencies and promote research in biomanufacturing. This will ensure India is well-prepared to leverage future advancements and economic opportunities in the sector.
- **Biomanufacturing Hubs**: The establishment of biomanufacturing hubs will facilitate the production of specialized chemicals, smart proteins, enzymes, and functional foods, fostering innovation and industry growth.
- **Talent Development**: The policy emphasizes the need to educate and train young talent in biomanufacturing and related technologies, ensuring a skilled workforce ready to drive future advancements and economic growth.

INDIAN EXPRESS

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NATIONAL MEDICAL COMMISSION (NMC)

(Syllabus GS Paper 2 – Health/Gov Policies)



Back in medical curriculum: Lesbianism as 'sexual offence', 'importance' of virginity

ANONNA DUTT
NEW DELHI, SEPTEMBER 3

THE NATIONAL Medical Commission (NMC), the country's apex medical education regulator, has revised the forensic medicine curriculum for undergraduate medical students, bringing back "sodomy and lesbianism" under the category of unnatural sexual offences.

The curriculum has also brought back topics such as importance of hymen, definition of virginity and defloration, and its legitimacy and medico-legal importance, which had been done away with in 2022 when the module was modified in accordance with the directions of the Madras High Court.

The revised curriculum does away with the distinction between consensual sex between queer individuals, adultery and offences such as incest and bestiality, which the NMC had introduced in 2022 to make the education more friendly to LGBTQ+ community.

The module on virginity was modified in 2022 on the recommendations of an expert committee constituted on directions of the Madras High Court to train students on how to apprise the courts about unscientific basis of these tests if the court orders it.

Changes were also made to the psychiatry module of the curriculum in 2022 to help the students better understand sex, gender identity and sexual orientation. While the module on psychiatry no longer mentions detailed topics such as difference between sex and gender identity and common myths and misconceptions, it has not completely slid back. The psychiatry module does not state that students should be taught about "gender identity disorders".

Under forensic medicine, the revised curriculum says students will be taught about the appropriate provisions of the new laws — Bharatiya Nagarika Suraksha Sanhita (BNSS), Bharatiya Nyay Sanhita (BNS) Bharatiya Sakshya Adhiniyam (BSA). It also mentions the appropriate provisions for cases such as rape, injury, and protection of children from sexual offences.

The changes in the curriculum have been uploaded on the NMC website. No specific reason has been cited for the revision. Repeated attempts to reach senior NMC officials regarding the changes remained unsuccessful.

The revised curriculum, meanwhile, does away with the seven-hour training about disability as part of the foundation course. It also does not include topics on disability in its module on medical ethics, a point raised by disability rights activists.

"These competencies should have been integrated longitudinally throughout the curriculum but are conspicuously absent from the 2024 curriculum," states a letter to written to Union Health Minister J P Nadda by disability rights activist Dr Satendra Singh and Dr Sanjay Sharma from the Association of Transgender Health in India.

"We, therefore, appeal to you to use the influence of your high office to correct this wrong which not only directly impacts the interests of persons with disabilities, the transgender and gender-diverse individuals, persons with differences in sexual orientation and persons with differences in sex development, but also damages the image of our nation in the international fora," the letter states.

Competency-Based Medical Education (CBME) curriculum was first introduced in 2019 by the Medical Council of India. This is the first time the new body — National Medical Commission, which took over from the MCI — has released a complete CBME.

EXPLAINED

Changes brought by NMC in 2022

THE 2022 modifications were made on directions of the Madras High Court. They included removing sodomy and lesbianism from unnatural sexual offences, making a distinction between sexual fetishes such as voyeurism, exhibitionism, or masochism and mental disorders stemming from such atypical interests, and teaching that two-finger test for virginity is "unscientific, inhuman, and discriminatory".

Context: The National Medical Commission (NMC) has revised the forensic medicine curriculum for undergraduate medical students, bringing back "sodomy and lesbianism" under the category of unnatural sexual offences.

National Medical Commission Act 2019

- **About:** An Act to provide for a medical education system that improves access to quality and affordable medical education, ensures availability of adequate and high quality medical professionals in all parts of the country.
- **Objective**: To promotes equitable and universal healthcare that encourages community health perspective and makes services of medical professionals accessibleto all the citizens.

National Medical Commission (NMC)

- **About**: The NMC stands as India's primary regulatory authority for medical education and practice, ensuring adherence to the highest standards in healthcare education and training nationwide.
- **Established by:** National Medical Commission Act, 2019, the NMC commenced its operations on September 25, 2020, following a gazette notification dated September 24, 2020.
    - This act dissolved the Board of Governors previously established under the Indian Medical Council Act, 1956.
- **Composition**: The Commission shall consist of the following persons to be appointed bythe Central Government, namely:— a Chairperson; ten ex officio Members; and twenty-two part-time Members.
- **Removal**: Central Government may, by order, remove from office the Chairperson or any other Member
- **Replaced:** NITI Aayog recommended the replacement of Medical Council of India (MCI) with National Medical Commission (NMC).
- **Mission**: Improving access to quality and affordable medical education, striving for equitable distribution of medical professionals across the nation.
- **Aim**: To promote universal healthcare by fostering a community health perspective, making medical services accessible to all citizens.

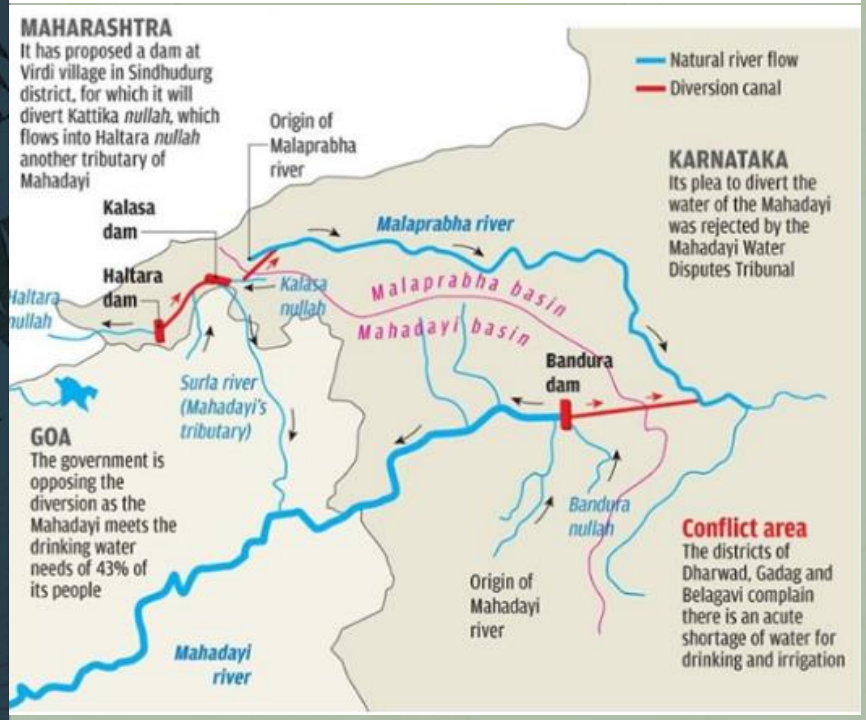
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Sep 3

KALASA NALA DIVERSION PROJECT

(Syllabus: GS Paper 3 – Env and Eco)

Wildlife Board denies approval for Kalasa Nala Diversion Project; conditional green light to controversial Goa Power Line



Context: In a meeting led by the Union Minister for Forests, Environment, and Climate Change, the National Wildlife Board (NWB) denied wildlife clearance for the Kalasa Nala Diversion Project due to ongoing legal challenges by the Goa government in the Supreme Court related to the Mahadayi project.

Kalasa Nala Diversion Project

- **About:** This water dispute between Governments of Karnataka, Goa and Maharashtra.
- **Objective**: To divert water from the Mahadayi River to meet the drinking water needs of the drought-prone regions of Karnataka, has faced multiple legal and environmental hurdles.
- **Coverage Area:** The Kalasa nala project involves the diversion of around 27 hectares of land, including 11 hectares in a tiger corridor between Karnataka and Goa.
- **Tributary Diversion**: The project involves the construction across Kalasa and Banduri, tributaries of the Mahadayi river, to divert water to the Malaprabha river.
- **Essential Water Source**: Malaprabha river, which is fed by the diverted water, is crucial for providing drinking water to Dharwad, Belgaum, and Gadag districts.
- **Legal Disputes**: In response to the objections, the Mahadayi Water Disputes Tribunal was established in 2010, involving Goa, Karnataka, and Maharashtra to resolve the conflict.

Mahadayi River

- **About:** It originates in the Western Ghats, specifically from the Bhimgad Wildlife Sanctuary in Karnataka's Belagavi district.
- **Course and Length**: The river flows 35 km through Karnataka and 82 km through Goa before it joins the Arabian Sea at Panaji in North Goa.
- **Importance**: It is rain-fed and serves as a crucial water source for both Karnataka and Goa.
- **Environmental Significance**: The Salim Ali Bird Sanctuary is situated on the island of Chorao in the Mandovi River, highlighting the river's ecological importance.
- **Major Tributaries**: Kalasa Nala, Banduri Nala, Surla Nala, and Haltar Nala, among others.

LIVEMINT

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APARAJITA WOMEN AND CHILD BILL 2024

(Syllabus: GS Paper 2 – Governance)

W. Bengal Assembly passes bill seeking death for rapist-killers

States can enact their own laws as long as they do not conflict with central legislation

HT Correspondent
letters@hindustantimes.com
KOLKATA

The West Bengal Assembly on Tuesday unanimously cleared a stringent new bill that seeks to make the death penalty mandatory in cases involving rape and murder, setting the stage for a protracted political face-off against the backdrop of the grisly death of a junior doctor in Kolkata last month that has sparked sweeping protests.

Introduced by chief minister Mamata Banerjee, the Aparajita Woman and Child (West Bengal Criminal Laws Amendment) Bill, 2024, sought to change several sections of the Bharatiya Nyaya Sanhita (BNS). The punishment for rape, gang rape, acid attacks and repeat offenders is proposed to be imprisonment for the remainder of the convict's life. For rape and murder, the proposed punishment is death.

For revealing the identity of the victim, a jail term between three and five years was proposed. The bill also proposed amendments to various sections of the Bharatiya Nagarik Suraksha Sanhita and Protection of Children from Sexual Offences (POCSO) Act, 2012 to ensure timebound trial, more fast-track courts and added infrastructure for law enforcement agencies.

In her speech, Banerjee referred to crimes against women in BJP-ruled states such as Uttar Pradesh and sought the resignation of Prime Minister Narendra Modi and Union home minister Amit Shah, triggering allegations from the BJP that she wanted to divert attention from the outrage over the Kolkata crime.

"We wanted the Centre to amend its existing laws and include stricter clauses to ensure exemplary punishment for perpetrators and quicker justice to victims. They showed no enthusiasm for it. That's why we made the move first," Banerjee said.

"This bill, once enacted, can serve as a model for the rest of the country."

> Punishment for rape, gang rape, acid attacks and repeat offenders is proposed to be imprisonment for the remainder of the convict's life

Criminal law falls under the concurrent list of the Constitution, meaning both the state and central legislatures have the authority to make amendments. States can enact their own laws as long as they do not conflict with central legislation. In cases of conflict or repugnancy, the central law takes precedence. However, if a state law that has a conflict with a central legislation receives the President's assent, it becomes effective within that state.

Capital change

Introducing the death penalty for rape, the Bill seeks to amend the Bharatiya Nyaya Sanhita and POCSO Act

BNS Section	Punishment now	Proposed
64(1) - Rape	10 years' RI that may extend to life and fine	RI for life or death
64(2) - Rape by police officer or public servant	10 years' RI that may extend to life and fine	RI for life and fine or death
66 - Rape that causes death or persistent vegetative state	20 years' RI that may extend to life or death	Death
70(1) - Gang rape	20 years' RI that may extend to life and fine	RI for life or death
70(2) - Repeat offenders	Life imprisonment or death	RI for life or death

Context: West Bengal legislative assembly passed the Aparajita Woman and Child (West Bengal Criminal Laws Amendment) Bill, 2024.

Aparajita Woman and Child (West Bengal Criminal Laws Amendment) Bill, 2024

- **Time-Bound Trial and Fast-Track Courts**: The Bill proposes amendments to expedite trials by ensuring time-bound proceedings, establishing more fast-track courts, and enhancing infrastructure for law enforcement agencies.
- **Revised Punishments for Certain Offences**: The Bill suggests replacing existing punishments, such as 10-year imprisonment, 20-year imprisonment, life imprisonment, and fines, with "imprisonment for life, which shall mean imprisonment for the remainder of that person's natural life, or with death and fine."
- **Changes to Section 124 of BNS**: Section 124 of BNS should be amended to replace the 10-year imprisonment, life imprisonment, and fines with "imprisonment for life, which shall mean imprisonment for the remainder of that person's natural life and fine."
- **Updated Penalties for Shorter Terms**: The Bill proposes replacing the current two-year jail term and fine with "no less than three years but which may extend to five years, and shall also be liable to fine."
- **Victim Support and Special Courts**: Amendments to the Bharatiya Nagarik Suraksha Sanhita 2023 include provisions for covering medical expenses and rehabilitation for victims, setting up special courts, and forming a task force led by a deputy superintendent of police for investigating specified offences.
- **Faster Investigations:** The Bill seeks to amend Section 193 of the Bharatiya Nagarik Suraksha Sanhita 2023 to ensure that investigations are completed within "21 days" instead of the previously stipulated "two months."
- **Changes to POCSO Act**: The Bill proposes changing the penalties of 10-year imprisonment, life imprisonment, and fines in the POCSO Act to "imprisonment for life, which shall mean imprisonment for the remainder of that person's natural life, or with death and fine."

TIME OF INDIA Sep 3

COLOMBO SECURITY CONCLAVE (CSC)

(Syllabus: GS Paper 2 – IR)

India signs up for Colombo Security Conclave sectt

Context: India signed the Charter and memorandum of understanding (MoU) for the establishment of the Colombo Security Conclave (CSC) Secretariat along with Sri Lanka, Maldives, and Mauritius.

Colombo Security Conclave (CSC)

- **About**: It is a regional security grouping comprising India, Bangladesh, Sri Lanka, Maldives, and Mauritius.
- **Origin**: The CSC evolved from the Trilateral for Maritime Security Cooperation, initially involving India, Maldives, and Sri Lanka, with meetings beginning in 2011.
- **Membership**: The current members of CSC include India, Bangladesh, Maldives, Mauritius, and Sri Lanka, while Seychelles holds observer status.
- **Objective:** To promote regional security by addressing transnational threats and challenges of common concern to the Member States.
- **Permanent Secretariat:** Colombo
- **There are five pillars of cooperation**:
  - Maritime safety and security
  - Countering terrorism and radicalisation
  - Combating trafficking and transnational organised crime
  - Cyber-security and protection of critical infrastructure
  - Humanitarian assistance and disaster relief.

Significance

- **India's Regional Outreach:** The CSC is viewed as a strategic initiative by India to enhance cooperation and shared security objectives in the Indian Ocean region.
- **Countering China**: One of the CSC's aims is to limit China's influence in this strategically important area and reduce its footprint in member countries.
- **Maritime Security**: With India's extensive coastline and strategic chokepoints, maritime security is crucial, and the CSC plays an essential role in safeguarding these areas.
- **Synergy with SAGAR Vision**: The CSC aligns with India's vision of "SAGAR: Security and Growth for all in the Region" and complements India's participation in the QUAD grouping.

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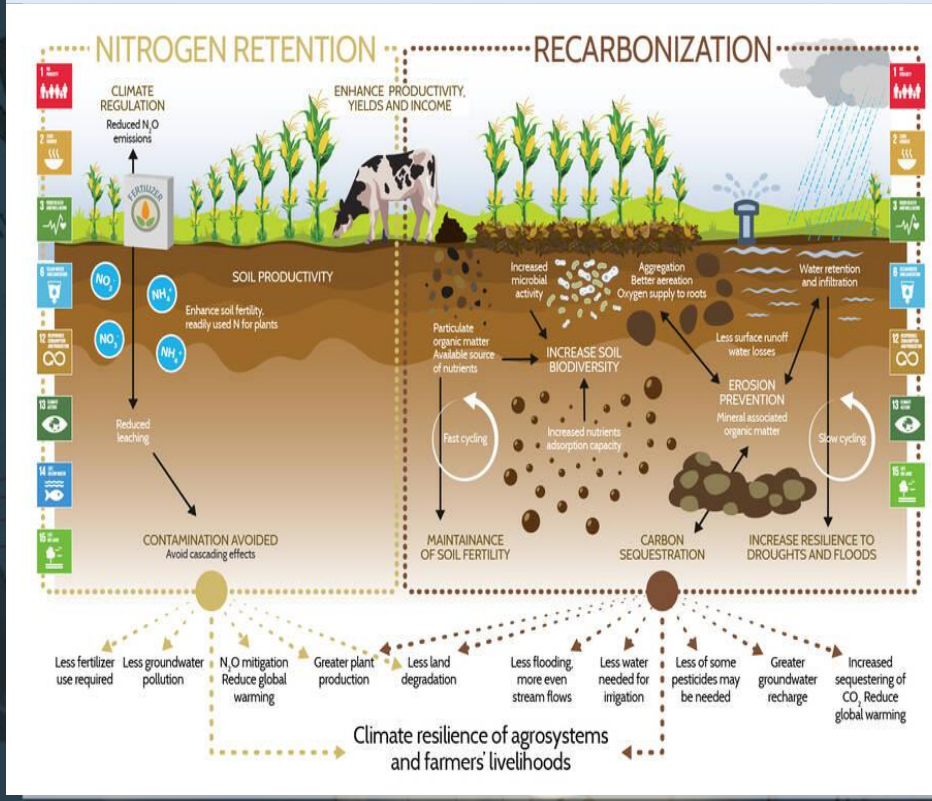
Sep 3

SOIL ORGANIC CARBON (SOC)

(Syllabus: GS Paper 3 – Agriculture)

Wildlife Board denies approval for Kalasa Nala Diversion Project; conditional green light to controversial Goa Power Line

Context: Recent data from the state's Agriculture Department revealed that more than half of Karnataka's agricultural land suffers from low levels of soil organic carbon (SOC) a critical indicator of soil health and fertility.



Soil Organic Carbon (SOC)

- **About:** It is a measureable component of soil organic matter. Organic matter makes up just 2–10% of most soil's mass and has an important role in the physical, chemical and biological function of agricultural soils.
  - Organic matter contributes to nutrient retention and turnover, soil structure, moisture retention and availability, degradation of pollutants, and carbon sequestration.
- **Soil Organic Matter**: SOM encompasses all organic components in the soil, but is challenging to measure directly, leading laboratories to focus on measuring and reporting SOC instead.
- **SOC's Role in Carbon Sequestration**: SOC plays a crucial role in carbon sequestration, which is a method proposed to mitigate climate change by capturing and storing atmospheric carbon dioxide in soils.
- **Impact of SOC:** Even small increases in SOC across large agricultural and pastoral areas can significantly reduce atmospheric carbon dioxide levels.
- **Main Component of SOM**: SOC, which forms the largest terrestrial carbon pool and is crucial for the planet's carbon cycle.
- **Global Significance of SOC**: Globally, the top 30 cm of soil contains more carbon than both the atmosphere and vegetation combined, highlighting the critical role of SOC in global carbon dynamics.
- **SOC and Soil Health**
  - **Soil Health Definition**: According to the Intergovernmental Technical Panel on Soils (ITPS), soil health is defined by the soil's ability to sustain productivity, diversity, and environmental services in terrestrial ecosystems.
  - **Indicator of Soil Health**: SOC is a vital element that enables soils to provide these essential services, making it a key indicator of soil health.

FINANCIAL EXPRESS
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INTERNATIONAL FINANCIAL SERVICES CENTRE

(Syllabus: GS Paper 3 – Economy)



What is an IFSC? How does it work?

WITH A VIEW to attract global investors and provide an avenue for domestic companies to access funds, the concept of International Financial Services Centres (IFSC) was brought about under the Special Economic Zones Act, 2005. However, it wasn't until 2015, when the first IFSC — the Gujarat International Finance Tec City (GIFT) was notified.

An IFSC caters to customers outside the jurisdiction of the domestic economy. Such centres deal with flows of finance, financial products and services across borders. Services offered by IFSCs include fund raising, asset management, wealth management, global and regional corporate treasury management, risk management operations such as insurance and reinsurance, and M&A activities among transnational corporations.

Which are the prominent IFSCs globally?

IFSCs HAVE BEEN established in London, Dubai, New York, and Singapore. They have been contributing to their respective country's economy in different ways.

For instance, the Dubai International Financial Centre (DIFC) has been expanding five times faster than the Emirates' average GDP growth rate over the past 10 years, contributing about 6% to its GDP. The thrust areas in the DIFC includes financial technology.

PUBLIC FLOAT THRESHOLD

Why GIFT City needs relaxed listing norms

Companies listing on stock exchanges at the International Financial Services Centre in GIFT City are now allowed to have a lower public float of 10%. ***Mayank Arora*** explains how a differential regulatory regime will help attract more entities

How has GIFT City fared?

AS THE ONLY operational IFSC in India, GIFT City has a mandate to accommodate units in banking, capital markets, fund management, insurance, bullion, finance company, aircraft leasing, ship leasing, global in-house centres (GICs), fintech, foreign universities and other ancillary services. The GIFT City has achieved a major breakthrough by licensing more than 360 units, generating more than 16,000 employment opportunities. The average daily turnover on international exchanges is more than $20 billion.

Other IFSCs planned in India include setting up one at Bandra-Kurla Complex (BKC) in Mumbai.

2
EXCHANGES — INDIA INX AND NSE IX — ARE OPERATIONAL AT GIFT CITY

THE IMMEDIATE BENEFICIARY OF THE REDUCED THRESHOLD WOULD BE THE GIFT CITY IN GUJARAT

>$20 bn
AVERAGE DAILY TURNOVER ON INTERNATIONAL EXCHANGES AT GIFT CITY

Reasons behind the reduced public float threshold

THE GOVERNMENT HAS reduced the minimum public float requirement for IFSCs to 10% from 25% earlier in order to attract more companies to list on exchanges at the IFSCs. This means that the promoters will now be able to retain a larger stake in their entity, thus retaining their control. This is expected to incentivise more entities to list on the IFSCs, offering a more business-friendly environment.

The regulatory regime for IFSCs draws its base from the domestic regulations; however, these are modified and adapted as per the global flavour and the prospective norms shall provide a conducive regulatory environment for IFSCs. It is noteworthy that listing on IFSC Authority-recognised stock exchanges would not equate to listing on domestic stock exchanges. Of course, the IFSC listed firms are not barred from listing on the domestic bourses.

Potential pitfalls of such regulatory relaxation

THERE COULD BE certain negative consequences of rolling out a more relaxed regulatory regime for IFSCs. For instance, in decision-making matters involving the sanction of the members of the company, the promoters may have an upper hand at passing such resolutions due to the reduced public shareholding. Again, un-diversified holding reduces market liquidity, affects fair price discovery in an open market and increases the chances of market manipulation. From an economic perspective, the concentration of holding in the hand of the promoters distorts equitable distribution of wealth in the economy.

However, we have seen that the public float thresholds for companies in India have been reduced in a staggered manner over the years, from as high as 40% prior to 1993. Thus, the regulators are keen on prompt adaptation to current market scenarios and the merits of the current notification may outweigh the limitations suggested.

Implementation challenges

THE IFSC IN India is currently at a nascent stage of development vis-a-vis its foreign counterparts. Further, only one IFSC has been notified in India so far. Also, it has been only four years since the IFSC Authority was established.

Thus, we may see a lot of regulatory hiccups and experiments resulting from implementation challenges faced by the stakeholders before the regulatory environment is well-established. However, considering the government's dedication towards covering the gaps, we may confidently conclude that the gaps will be satisfactorily taken care of in the coming years.

The writer is director, Nangia Andersen (With inputs from Ridhima Jain, associate, Nangia Andersen)

Context: Companies listing on stock exchanges at the International Financial Services Centre in GIFT City are now allowed to have a lower public float of 10%.

International Financial Services Centre

- **About:** An IFSC caters to customers outside the jurisdiction of the domestic economy. Such centres deal with flows of finance, financial products and services across borders.
- **Centres**: London, New York and Singapore can be counted as global financial centres.
- Many emerging IFSCs around the world, such as Shanghai and Dubai, are aspiring to play a global role in the years to come.
- **Legal Foundation:** The concept of IFSCs was introduced under the Special Economic Zones Act, 2005, in India.
- **First IFSC**: The first IFSC in India, the Gujarat International Finance Tec City (GIFT).
  - **Establishment:** on April 27, 2020, by the International Financial Services Centres Authority Act, 2019.
  - **Headquarters:** GIFT City, Gandhinagar in Gujarat.
  - **Objective:** It is a unified authority for the development and regulation of financial products, financial services and financial institutions in the International Financial Services Centre (IFSC) in India.

Mechanism of IFSC

- **Target Customers**: IFSCs cater primarily to customers and financial activities outside the domestic economy's jurisdiction.
- **Cross-Border Financial Services:** IFSCs handle financial flows, products, and services across international borders.
- **Range of Services**: The services offered by IFSCs include fund raising, asset management, wealth management, and global corporate treasury management.
- **Risk Management**: IFSCs provide risk management services, such as insurance and reinsurance.
- **Mergers & Acquisitions**: They facilitate mergers and acquisitions (M&A) activities among transnational corporations

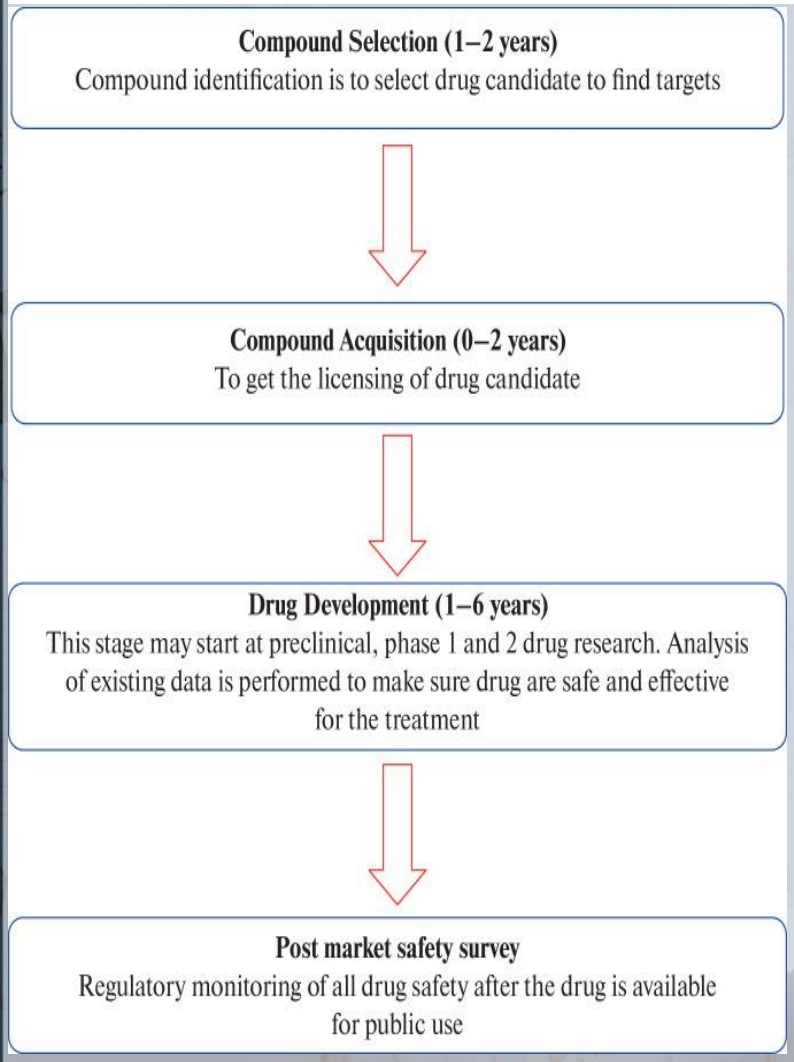
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Sep 3

DRUG REPURPOSING

(Syllabus: GS Paper 3 – Sci and Tech)

Antidepressant drug can be repurposed for treating breast cancer



Context: Researchers at the Institute of Advanced Study in Science and Technology (IASST) have discovered the potential to repurpose an antidepressant drug for cancer management. This finding opens new avenues for cancer treatment.

Drug Repurposing

- **Definition**: It involves using an existing drug or drug candidate for a new treatment or medical condition for which it was not originally indicated.
- **Initial Development:** Drugs are often initially developed to treat a different medical condition than the one they are eventually repurposed for.
- **Side Effects:** Drug molecules can indicate potential effectiveness in treating entirely different medical conditions.
- **Established Safety**: Repurposed drugs typically have established safety profiles in humans and are tested for efficacy in new diseases.
- **Development**: The process can expedite drug development by moving directly to preclinical and clinical trials, thus reducing risk and costs.

Importance of Drug Repurposing

- **New Compound Identification**: Repurposing can reveal new therapeutic uses based on phenotypic benefits, even without a defined mechanism of action.
- **Preclinical Testing**: Results from preclinical animal models can be more directly applicable to clinical research and applications.
- **Reduced Risk**: There is generally a lower risk of failure with repurposed drugs due to their established safety profiles.

NEW INDIAN EXPRESS

Sep 3

SAORAS TRIBE

(Syllabus: GS Paper 1 – Indian Society)

Saoras become 5th particularly vulnerable tribal group to get habitat rights in the state

Context: The Saoras have become the fifth particularly vulnerable tribal group in Odisha to be granted habitat rights.

Saoras Tribe

- **About**: It is one of the ancient tribes of Odisha, which is also mentioned in the epics Ramayana and Mahabharata.
- **Also known as**: Savaras, Sabaras, Saura, Sora, etc.
- **Geographic Distribution**: Though Odisha is the main land for the tribe, a small number of people are also found in the states of Andhra Pradesh, Jharkhand, Madhya Pradesh, and Assam.
- **Language and Script**: They have their own native language called Sora, which is a Munda language, and they are one of the very few tribes of India that have a script for the language, Sorang Sompeng.
- **Physical Characteristics**: The Saoras show their racial affinity to the Proto Australoid physical characters, which are dominant among the aborigines of Central and Southern India.
- **Religious Beliefs**: Saoras follow an ingrained and intricate religion, having faith in and worshipping a number of gods and spirits, who they believe are the supreme controllers of their regular lives.
- **Art and Customs**: They have unique art practices, religious customs, as well as a dying tattooing tradition called 'Tantangbo'.
- **Economic Divisions:**
    - The Saoras of the plains (Sudha Saora): Depending on their wet cultivation or wage earning and selling firewood.
    - The Hill Saoras (Lanjia Saora): Practice shifting and terraced cultivation on the hill slopes.

Habitat Rights under FRA

- **Definition**: Section 2(h) of the FRA defines habitat as the customary habitat plus additional habitats in reserved and protected forests for primitive tribal groups, pre-agricultural communities, and other forest-dwelling scheduled tribes.
- **Facilitation in Odisha:** The ST and SC Development department facilitated habitat rights for Paudi Bhuyans in Deogarh, Juangs in Keonjhar and Jajpur, and Chuktia Bhunjia in Nuapada, according to Section 3(1)(e) of The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.
- **Rights for PVTGs:** Habitat rights are specifically granted to Particularly Vulnerable Tribal Groups (PVTGs) under Section 3(1)(e) of the FRA, which aims to protect their traditional forest dwellings.
- **Implementation in Other States:** Beyond Odisha, Madhya Pradesh has granted habitat rights to the Bharia PVTG, while Chhattisgarh has extended these rights to the Kamar and Baiga PVTGs.

INDIAN EXPRESS

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PROJECT STRAWBERRY

(Syllabus: GS Paper 3 – Sci and Tech)

OpenAI's Project Strawberry and the promise of AI's next big breakthrough

BIJIN JOSE
NEW DELHI, SEPTEMBER 3

OPENAI, the world's premier artificial intelligence research organisation, will likely release its most powerful AI model this fall (September-November), and could integrate it into ChatGPT-5, the new version of the chatbot and virtual assistant that it launched in late 2022.

EXPLAINED AI

The secretive project, on which OpenAI has been working for long, was earlier known as Project Q* (Q-star), and is now codenamed Project Strawberry. It is expected to feature autonomous Internet research and dramatically improve AI reasoning capabilities, and has been billed as OpenAI's push to create Artificial General Intelligence — AI with capabilities similar to that of the human brain.

On August 7, OpenAI CEO Sam Altman posted an image of strawberries growing in two pots to his X account. The tweet was seen as confirmation that OpenAI is working on the new and powerful large language model (LLM).

OpenAI was reported to have demonstrated a version of the new model to national security officials, seemingly a statement of its commitment to transparency at a time when the rapid development of AI has raised serious security concerns among national governments.

A wizard at math

The influential California-based tech industry business publication *The Information* reported on August 26 that Project Strawberry would be better at math and programming than any existing chatbot, quoting "two people who have been involved in the effort".

Integration with ChatGPT will make the latter the most powerful AI chatbot there is, the report said. ChatGPT has sometimes struggled with math, and experts think the errors could be due to the absence of adequate mathematical information in the training data.



An illustration of a high-tech AI lab, where a big strawberry is being analysed by advanced AI systems.
DALL-E text-to-image model created by OpenAI

The Information report said that a demo by Project Strawberry staff had shown that the new AI model is capable of advanced levels of thinking, which allowed it to solve puzzles, including *The New York Times* 'Connections', a particularly difficult word puzzle.

Need for training

The Information said that Project Strawberry aims to raise more capital, which OpenAI needs for its next-frontier model, codenamed Orion.

The generation of high-quality training data for Orion is believed to be one of Project Strawberry's key applications. This is significant because most of the training data on the Internet has already been used, and there is now a dearth of information that is outside paywalls and authentication, and is free to access for the purpose of training AI models. Indeed, OpenAI has been of late making deals with publications to use their content for training.

Project Orion, which is being designed to outperform GPT-4, could use a combination of Project Strawberry and high-quality synthetic data that would likely reduce errors and hallucinations compared to its predecessors and other AI models.

Creating synthetic data

Altman has said that in order to try out different ways to train AI models, OpenAI has been testing how to generate large amounts of synthetic data. Generative AI models create synthetic data based on real-world data samples. The algorithms learn patterns, correlations, and statistical properties of the sample data; after it is trained, the model can produce statistically identical synthetic data.

The large datasets that AI models rely on could be prone to biases and errors, or could have incomplete or inaccurate information — high-quality synthetic data produced by Project Strawberry can fill gaps in real-world data sets and provide a more wholesome, inclusive, and balanced training set.

Many believe that the use of synthetic data can help make future AI models more neutral and fair, and reduce noise and irrelevant information — thereby improving both the efficiency of training and the accuracy of the model.

Big Strawberry leap

Based on what is known, Project Strawberry's improved reasoning, logic, and the ability to plan and carry out research, could allow the model to autonomously conduct experiments, analyse data, and come up with new hypotheses. This could potentially lead to scientific breakthroughs, including the discovery of new drugs. The models could also offer personalised education, creating educational content and interactive lessons.

Context: OpenAI is developing a confidential project named 'Strawberry' with the goal of advancing AI research and planning capabilities.

Project Strawberry

- **About:** OpenAI is developing a new reasoning technology codenamed "Strawberry," which is thought to be the new name for Project Q*.
- **Objective**: To allow AI models to plan in advance, autonomously browse the internet, and perform in-depth research.
- **Differences from Existing AI Models:**
  - **Current Limitation**: Existing Large Language Models (LLMs) excel in summarizing texts and composing prose but struggle with common sense and multi-step logic.
  - **Strawberry Models' Advantage**: Strawberry models feature improved reasoning abilities, enabling them to tackle complex problem-solving tasks and potentially make landmark scientific discoveries.
- **Effective Planning and Execution**:
  - **Current Limitation:** LLMs lack the capability for effective planning and managing multi-step processes without external support.
  - **Strawberry Models' Advantage**: These models are designed to perform tasks that involve planning and executing a series of actions over extended periods, aligning with Sam Altman's vision of AI taking time to think through problems.

Applications of Strawberry Models

- Strawberry models could conduct experiments, analyze data, and propose new hypotheses, leading to significant scientific breakthroughs.
- They might aid in drug discovery, genetics research, and personalized medicine by analyzing vast datasets.
- Enhanced problem-solving abilities could help in solving complex mathematical problems and performing engineering calculations.
- These models could also assist in legal analysis and strategic planning through logical deductions.
- AI could offer tailored tutoring, create educational content, and develop interactive lessons, enhancing the learning experience.

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