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INDIAN EXPRESS

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RECUSAL OF JUDGES

(Syllabus: GS Paper 2 - Polity & Governance)

SC judge recuses from hearing plea against ED chief's tenure extension

EXPRESS NEWS SERVICE
NEW DELHI, NOVEMBER 18

SUPREME COURT judge Justice S K Kaul Friday recused himself from hearing a petition challenging the extension in tenure granted to Enforcement Directorate chief S K Mishra last year.

"I cannot take up the matter," Justice Kaul said, adding that the matter will be listed before a bench of which he is not part of.

The bench, also comprising Justice A S Oka, was hearing petitions filed among others by Congress leaders Jaya Thakur, R S Surjewala and Trinamool Congress leader Mahua Moitra.

A counsel representing one of the petitioners, meanwhile, said there is an urgency in the matter as the government once again extended Mishra's tenure Thursday. Justice Kaul said he cannot direct early listing as he has recused.



Justice S K Kaul

The bench instead directed that the matter be placed before the Chief Justice of India for necessary orders.

The petitions challenge the amendments made by the government to the Central Vigilance Commission (CVC) Act, 2003, through an ordinance on November 14, 2021, giving itself the power to extend the tenure of the ED Director by up to five years.

Mishra was appointed ED Director on November 19, 2018, for two years. On November 13, 2020, this was extended by one year. It was again extended by another year in 2021.

In September 2021, the Supreme Court, dismissing a petition by NGO Common Cause, had refused to interfere with the extension of service granted to Mishra, stating that the CVC Act, 2003 only said that such officers shall hold office for not less than two years which cannot be read to mean not more than two years. The court, however, added, "Though we have upheld the power of the Union of India..., we should make it clear that extension of tenure granted to officers who have attained the age of superannuation should be done only in rare and exceptional cases." The bench said it did not intend to interfere with the extension of tenure of Mishra "for the reason that his tenure is coming to an end in November, 2021" but added that "no further extension shall be granted to" him beyond that date.

Context: Supreme Court judge recused himself from hearing a series of petitions challenging the "piecemeal" one-year extension in service the government is granting Directorate of Enforcement (ED) Director.

Recusal of Judges

- **About**: Recusal, referred to as **Judicial disqualification,** is the **act of abstaining** from participation in an official action such as a legal proceeding due to a conflict of interest of the presiding court official or administrative officer.
- **Based on Principle of natural Justice:** The genesis of the concept of recusal of judges can be traced from the principle that implies fairness, reasonableness, equity and equality i.e., Natural Justice.
  - According to this principle, the judge must not have any interest in the subject-matter of the case.
- **Reasons**: When **there is a conflict of interest**, a judge can withdraw from hearing a case to prevent creating a perception that she carried a bias while deciding the case.
  - The conflict of interest can be in many ways - from **holding shares** in a company that is a litigant to having a **prior or personal association** with a party involved in the case.
  - Another instance for recusal is when an appeal is filed in the Supreme Court against a judgement of a High Court that may have been **delivered by the SC judge when she was in the HC**.
- **Process for recusal:** There are **no formal rules governing recusals**, although several Supreme Court judgments have dealt with the issue.
  - The **decision to recuse generally comes from the judge herself** as it rests on the conscience and discretion of the judge to disclose any potential conflict of interest.
  - In some circumstances, lawyers or parties in the case bring it up before the judge.
  - If a judge recuses, the case is listed before the Chief Justice for allotment to a **fresh Bench.**
- **Record of reasons for recusal**: Since there are no formal rules governing the process, it is **often left to individual judges to record reasons for recusal.**
  - Some judges disclose the reasons in open court; in some cases, the reasons are apparent.
- **Limitations:** Once a request is made for recusal, the **decision to recuse or not rests with the judge.**
  - While there are some instances where judges have recused even if they do not see a conflict but only because such an apprehension was cast, there have also been several cases where judges have refused to withdraw from a case.

SC's View

- **Ranjit Thakur v Union of India (1987):** The SC held that the test of the likelihood of bias is the reasonableness of the apprehension in the mind of the party.
  - The judge needs to look at the mind of the party before him, and decide that he is biased or not.
- **Supreme Court Advocates-on-Record Association v. Union of India (2015):** Justice J. Chelameswar in his opinion in this case held that "Where a judge has a pecuniary interest, no further inquiry as to whether there was a 'real danger' or 'reasonable suspicion' of bias is required to be undertaken".

BUSINESS STANDARD
Page 1

COMPTROLLER AND AUDITOR GENERAL OF INDIA

(Syllabus: GS Paper 3 - Polity & Governance)

CAG to audit urban bodies

INDIVJAL DHASMANA
New Delhi, 18 November

The Comptroller and Auditor General of India (CAG) has decided to audit urban local bodies (ULBs) to bring out the performance of these authorities in the context of the 74th constitutional amendment carried out in the early1990s and respective state Acts.

Sources said that the audit of the implementation of the amendment is aimed at a holistic performance assessment of these bodies. The audit, to be carried out in the states, is based on the provisions of the amendment and the state Acts governing ULBs as well as rules and manuals framed therein.

According to sources, empowerment of ULBs through the creation of a robust institutional framework as well as devolution/ transfer of functions, funds and functionaries is a key area of assessment. They pointed out that financial grants to ULBs are released based on recommendations of the Finance Commission. "The CAG audit looks into utilisation of such grants," a source said.

According to the 15th Finance Commission and studies conducted by think tanks, barring a few states, most of the state finance commissions (SFCs) have been rendered ineffective and toothless by the state governments, and many have not set up new SFCs after the stipulated five-year period.

This impacts the flow of funds and the necessary devolution of powers to local bodies. "The SFCs need to play a much more critical role in recommending taxes assigned to municipalities and other local governments and related financial relations between the states and their municipalities," the 15th Finance Commission had said in its report for the period 2021-2026.

Context: The Comptroller and Auditor General of India (CAG) has decided to audit urban local bodies (ULBs) to bring out the performance of these authorities in the context of the 74th constitutional amendment carried out in the early 1990s and respective state Acts.

Comptroller and Auditor General of India (CAG)

- **About:** The apex authority responsible for external and internal audits of the expenses of the National and state governments.
- **Constitutional body: Part V of the Indian Constitution** describes the role and responsibilities of this office in Chapter V.
  - **Article 148**: Deals with the **CAG appointment, oath and conditions of service**.
  - **Article 149:** Deals with **Duties and Powers** of the Comptroller and Auditor-General of India.
  - **Article 150:** The accounts of the **Union and of the States** shall be kept in such form as the President may, on the advice of the CAG, prescribe.
  - **Article 151:** The reports of the CAG of India relating to the accounts of the Union shall be **submitted to the president**, who shall cause them to be laid before each House of Parliament.
- **Appointment**: Appointed by the **President of India** by a warrant under his hand and seal.
  - He can resign any time from his office by **addressing the resignation letter to the president.**
- **Removal**: Can be removed from office only in the **manner and on the grounds that a Judge of the Supreme Court** is removed.
- **Oath**: The person appointed to this office should **take an oath of office before the President** or any other person appointed by the office of the President.
  - **Third Schedule of the Constitution of India** prescribes the form of oath or affirmation be made by the Judges of the Supreme Court and the Comptroller and Auditor-General of India at the time of assumption of office.
- **Conditions of service:** The salary, service conditions, leaves of absence, pension, and age of retirement are determined by the Parliament of India and specified in the **Second Schedule** such that the service conditions and salary will not be modified to the disadvantage of the incumbent during their tenure.
  - The expenses on the administration of this office including all allowances, salaries and pensions would be charged to the **Consolidated Fund of India**.
- **Tenure**: The incumbent is appointed for a **period of 6 years or until attaining the age of 65 years** whichever is earlier.
  - The CAG is **not eligible for any further office** after the end of their tenure either in the Government of India or any State Government.
- **Power and functions**: Subject to the **provisions of the Indian Constitution and any Acts of Parliament**, along with the service conditions for the Indian Audits and Accounts Department.
  - The rules governing these would be **prescribed by the President** in consultation with the incumbent.
  - Article 279 deals with the Calculation of "net proceeds" is a**scertained and certified by the Comptroller and Auditor-General of India**, whose certificate is final.
  - According to the **6th Schedule the accounts of the District Council or Regional Council** should be kept in such form as CAG, with the approval of the President, prescribes. In addition, these bodies' accounts are audited in such a manner as CAG may think fit, and the reports relating to such accounts shall be submitted to the Governor who shall cause them to be laid before the Council.

THE HINDU Page 8

NATIONAL PENSION SCHEME
(Syllabus: GS Paper 2 - Social Justice)

Punjab govt. nod for old pension scheme

The Hindu Bureau
CHANDIGARH

The Punjab Cabinet on Friday gave the go-ahead to a notification implementing the old pension scheme (OPS) for government employees. The decision was taken in a meeting chaired by Chief Minister Bhagwant Mann here. The Punjab government had announced last month about its in-principle decision to restore the old scheme.

The OPS was abolished by the National Democratic Alliance government at the Centre in 2003 and the National Pension Scheme (NPS) came into force on April 1, 2004. It was carried forward by the Congress-led United Progressive Alliance governments.

While the Aam Aadmi Party government in Punjab moves forward on OPS restoration, the issue has held centre stage in recent months with several Congress-ruled States also announcing their decision to roll it out. In May, the Ashok Gehlot-led Rajasthan government and the Bhupesh Baghel-led Chhattisgarh government chose to reintroduce the OPS.

The party has promised to restore the scheme in Gujarat and Himachal Pradesh if elected, triggering a debate within a section of the party around the financial implications of implementing the move.

1.75 lakh staff to benefit

An official statement, issued on Friday after the Cabinet meeting, said the return to OPS will benefit over 1.75 lakh government employees currently covered under the NPS.

"In addition to this, 1.26 lakh employees are already covered under the existing old pension scheme. The scheme is expected to benefit more than 4,100 employees in the next five years alone," it said.

CONTINUED ON » PAGE 8

Context: The Punjab Cabinet gave the go-ahead to a notification implementing the old pension scheme (OPS) for government employees.

Old and New Pension Scheme

- **Old Pension Scheme (OPS)**: Pension to government employees at the Centre as well as states was fixed a**t 50 per cent of the last drawn basic pay.**
  - The OPS was **abolished at the Centre in 2003** and the National Pension Scheme (NPS) came into force on April 1, 2004.
- **New Pension Scheme (NPS):** It laid in its promise of an assured or 'defined' benefit to the retiree. It was hence described as a 'Defined Benefit Scheme'.
- **Eligibility of NPS: Any individual citizen of India (both resident and Non-resident)** in the age group of 18-70 years (as on the date of submission of NPS application) can join NPS.
  - The NPS was for prospective employees; it was made **mandatory for all new recruits** joining government service from January 1, 2004.
- **Key features of the NPS:**
  - **Participatory scheme**: Where employees contribute to their pension corpus from their salaries, with matching contributions from the government. The f**unds are then invested in earmarked investment schemes** through Pension Fund Managers.
  - **Contributions**: The **defined contribution comprised 10 percent** of the basic salary and dearness allowance by the employee and a matching contribution by the government this was Tier 1, with contributions being mandatory.
    - In 2019, the government increased its **contribution to 14 percent of the basic salary** and dearness allowance.
  - **Options and Alternatives**: In 2019, the Finance Ministry said that Central government employees have th**e option of selecting the Pension Funds (PFs)** and Investment Pattern.
    - At retirement, they can withdraw 60% of the corpus, which is tax-free and the remaining 40% is invested in annuities, which is taxed.
- **Implementing agency**: Implemented and regulated by **PFRDA (Pension Fund Regulatory and Development Authority).**
  - National Pension System Trust (NPST) established by PFRDA is the registered owner of all assets under NPS.
- **Schemes under the NPS are offered by nine pension fund managers:** It is sponsored by SBI, LIC, UTI, HDFC, ICICI, Kotak Mahindra, Aditya Birla, Tata, and Max.

LIVEMINT Page 22

ESMA ISSUE
(Syllabus: GS Paper 3 - Economy)

Foreign banks may ask ESMA to defer clearing house action

Shayan Ghosh & Gopika Gopakumar

MUMBAI

Foreign banks in India are likely to request European Union's financial markets regulator to defer by a year its decision to derecognize a clutch of Indian clearing houses from 30 April, a person familiar with the development said.

The issue stems from the European Securities and Markets Authority (ESMA) reviewing the status of six Indian clearing houses and deciding to derecognize them. The step will affect European banks' ability to settle trades and conduct treasury operations in India. The ones listed for derecognition are the Clearing Corp. of India Ltd; Indian Clearing Corp. Ltd; India International Clearing Corp. Ltd; NSE Clearing Ltd; India International Clearing Corp. Ltd; NSE IFSC Clearing Corp. Ltd; and Multi Commodity Exchange Clearing Corp. Ltd.



The ability of foreign banks such as Deutsche Bank to settle trades and conduct treasury operations in India may be hit.

ESMA said on 31 October, "not all of cumulative conditions under EMIR for recognition of these six central counterparties are met, as no cooperation arrangements...have been concluded". Following the 2008 global crisis, the EU adopted the European Market Infrastructure Regulation (EMIR) in August 2012 to increase transparency and reduce risks in over-the-counter derivatives market. Article 25 of EMIR requires CCPs in global jurisdictions providing services to European banks to be approved by ESMA.

Mint reported on 11 November that India signed a pact with ESMA in 2017, which lapsed in March. While ESMA now wants to revise the pact, Indian regulators have not agreed to some clauses on including supervisory powers to inspect Indian clearing corporations.

"We will have to approach the regulators abroad and request them to defer this by a year or so.

TURN TO PAGE 18

Context: Foreign banks in India are likely to request European Union's financial markets regulator to defer by a year its decision to derecognize a clutch of Indian clearing houses from 30 April.

Issue of recognition of six Indian clearing bodies or central counterparties (CCPs)

- **Recent issue**: The European Union's financial markets regulator European Securities and Markets Authority (ESMA) said it will **withdraw recognition of six Indian clearing bodies** or central counterparties (CCPs).
  - **These six CCPs are:** Clearing Corporation of India (CCIL), Indian Clearing Corporation Ltd (ICCL), NSE Clearing Ltd (NSCCL), Multi Commodity Exchange Clearing (MCXCCL), India International Clearing Corporation (IFSC) Ltd (IICC) and NSE IFSC Clearing Corporation Ltd (NICCL).
- **Reason for derecognition**: The decision to derecognise Indian CCPs came **due to 'no cooperation arrangements'** between the ESMA and Indian regulators: Reserve Bank of India (RBI), Securities and Exchange Board of India (SEBI) and International Financial Services Centres Authority (IFSCA).
  - The ESMA **wants to supervise these CCPs,** which the Indian regulators are not in favour of as they feel that these entities have robust risk management and there is no need for a foreign regulator to inspect them.
- **Impact of Derecognition**: These CCPs will **no longer be able to provide services** to clearing members and trading venues established in the EU.
  - The derecognition will **impact the lenders** as they will not be able to provide clearing and settlement facilities to their clients.
  - They will also have to **set aside additional capital** to trade in the domestic market.
  - Of the total foreign portfolio investors (FPI) registered in India, **close to 20 per cent are from Europe.**
- **About CCP**: CCP is a system provider, who by way of novation interposes between system participants in the transactions admitted for settlement, thereby becoming the **buyer to every seller and the seller to every buyer,** for the purpose of effecting settlement of their transactions.
  - **Legal status**: A CCP is **authorised by the RBI** to operate in India under Payment and Settlement Systems Act, 2007.
  - **Role of these CCPs**: CCPs perform two main functions as the intermediary in a market transaction:
    - Clearing and settlement
    - Guarantee the terms of a trade.
    - As per the European Market Infrastructure Regulations (EMIR), a CCP in a third country can provide clearing services to European banks only if it is recognized by the ESMA.
- **About ESMA**: It is an **independent European Union (EU) Authority** that contributes to **safeguarding the stability of the EU's financial system** by enhancing the protection of investors and promoting stable and orderly financial markets.
  - ESMA is the direct supervisor of specific financial entities: Credit Rating Agencies (CRAs), Securitisation repositories (SRs), Trade Repositories (TRs).
  - These entities form essential parts of the EU's market infrastructure.

ECONOMIC TIMES

Page 4

ECONOMIC COOPERATION AND TRADE AGREEMENT

(Syllabus: GS Paper 2 - International Relations)

Context: Taking a step towards implementation of the India-Australia free trade pact, Australia's Joint Standing Committee on Treaties recommended ratification of the Economic Cooperation and Trade Agreement (ECTA) with India to its government.



Oz Panel Proposes Ratification of Trade Deal with India

Kirtika.Suneja
@timesgroup.com

New Delhi: Taking a step towards implementation of the India-Australia free trade pact, Canberra's Joint Standing Committee on Treaties Friday recommended ratification of the Economic Cooperation and Trade Agreement (ECTA) with New Delhi to its government.

The committee, which has been appointed by the Commonwealth Parliament and reviews Australian government's treaty actions, said that "there is no single market with more growth opportunities for Australian businesses than India".

The ECTA will enter into force 30 days after both countries have confirmed with each other in writing that they have completed their respective domestic requirements.

Panel says: "There is no single market with more growth opportunities for Australian biz than India"

As per the committee's report, opening new markets is important for market diversification for Australia, and deepening economic links with "like-minded partners would support open markets and a stable and prosperous Indo-Pacific".

India - Australia ECTA

- **About:** It **covers almost all the tariff lines** dealt in by **India and Australia** respectively.
- **Key Features**: Under the agreement, **Indian graduates from STEM** (Science, Technology, Engineering and Mathematics) will be granted **extended post-study work visas.**
  - It will provide **zero-duty access to 96% of India's exports** to Australia and will give about 85% of Australia's exports zero-duty access to the Indian market.
  - The A**greement encompasses cooperation across the entire gamut of bilateral economic and commercial relations** between the two friendly countries and covers areas like Trade-in Goods, Rules of Origin, Trade in Services, Technical Barriers to Trade (TBT), Sanitary and Phytosanitary (SPS) measures, Dispute Settlement, Movement of Natural Persons, Telecom, Customs Procedures, Pharmaceutical products, and Cooperation in other Areas.
  - **Eight subject-specific side letters** covering various aspects of bilateral economic cooperation were also concluded as part of the Agreement.
- **Commitments by Australia**: As regards trade in services, A**ustralia has offered wide-ranging commitments** in around 135 sub-sectors and Most Favoured Nation (MFN) in 120 sub-sectors which cover key areas of India's interest like IT, ITES, Business services, Health, Education, and Audiovisual.
  - **Some of the key offers from Australia in the services space include**: Quota for chefs and yoga teachers; Post-study work visa of 2-4 years for Indian students on reciprocal basis; mutual recognition of Professional Services and Other licensed/regulated Occupations; and Work & Holiday visa arrangement for young professionals.
- **Commitments by India: India has offered market access to Australia in around 103 sub-sectors** and Most Favoured Nation in 31 sub-sectors from the 11 broad service sectors such as 'business services', 'communication services', 'construction and related engineering services, and so on.
  - Both sides have also a**greed to a separate Annex on Pharmaceutical products** under this agreement, which will enable fast track approval for patented, generic and biosimilar medicines.
- **Significance**: India will **benefit from preferential market access** provided by Australia on 100% of its tariff lines.
  - India will be offering preferential access to Australia on over 70% of its tariff lines.

TIMES OF INDIA

Page 2

NATIONAL HUMAN RIGHTS COMMISSION

(Syllabus: GS Paper 2 - Polity & Governance)

NHRC seeks timeline on fixing air quality

The National Human Rights Commission (NHRC) has asked the Delhi government to fix a timeline to rectify the cause of poor air quality at hotspots and inquired about the status of alternative landfill sites. The NHRC on Friday held the third hearing of chief secretaries of Punjab, UP, Haryana and Delhi on air pollution in NCR in light of their reports. The next date of hearing has been fixed for November 25. PTI

Context: The National Human Rights Commission (NHRC) has asked the Delhi government to fix a timeline to rectify the cause of poor air quality at hotspots and inquired about the status of alternative landfill sites.

National Human Rights Commission (NHRC)

- **About:** Entity of the Government of India with the **mission of promoting and protecting human rights.**
- **Statutory body**: It was established in 1993, is an independent statutory body as per the provisions of the **Protection of Human Rights Act of 1993** which was amended in 2006.
- **Functions**: The functions of the NHRC as stated in Section 12 of the Protection of Human Rights Act,1993 includes e**nquiry into complaints of violation of human rights or negligence in the prevention of such violation by a public servant.**
- **Institutional Framework**: Composed of a **Chairperson and eight other members:**
  - **Chairman of NHRC**: Retired Chief Justice of India
  - **Member 1**: One who is/has been a Judge of Supreme Court of India
  - **Member 2:** One who is/has been a Chief Justice of a High Court
  - **Two Members**: Candidates with the knowledge or practical experience in the matters of Human Rights
  - **Deemed Members (Ex-officio Members):** Deemed members are chairpersons of the national commissions: National Commission for Minorities, National Commission for Scheduled Castes, National Commission for Scheduled Tribes and National Commission for Women.
- **Appointment of NHRC Members:** A **Selection Committee** will recommend the candidates to the President.
  - **The Selection Committee includes**: Prime Minister (Chairman), Speaker of Lok Sabha, Union Home Minister, Deputy Chairman of Rajya Sabha and Leaders of the Opposition in both Houses of the Parliament.
- **Tenure of members:** The Chairperson or the Members of the National Human Rights Commission holds office for a **term of three years** or until they attain the age of 70 years, whichever is earlier.
  - Earlier the tenure of office was **5 years or 70 years** whichever is earlier but the Protection of Human Rights (Amendment) Bill 2019 brought in certain changes.
- **Limitations of NHRC:**
  - The Recommendations made by the NHRC are **not binding.**
  - Violation of Human rights by private parties **cannot be considered under NHRC Jurisdiction.**
  - NHRC **doesn't have the power to penalise** the authorities that don't implement its recommended orders.
  - The NHRC **does not consider the following cases:**
    - Cases that are older than one year.
    - Cases that are anonymous, pseudonymous or vague.
    - Frivolous cases.
    - Cases pertaining to service matters.

PIB

Nov 19

REGULATORY FRAMEWORK FOR PROMOTING DATA ECONOMY

(Syllabus: GS Paper 3 - Infrastructure)

TRAI releases recommendations on "Regulatory Framework for Promoting Data Economy Through Establishment of Data Centres, Content Delivery Networks, and Interconnect Exchanges in India"

Context: The Telecom Regulatory Authority of India (TRAI) has released its recommendations on **'Regulatory Framework for Promoting Data Economy** Through Establishment of Data Centres (DCs), Content Delivery Networks (CDNs), and Interconnect Exchanges (IXPs) in India'.

Salient features of the recommendations

- **Data Centres**: Authority has recommended to **bring out Data Centre Incentivization Scheme (DCIS)** for establishing Data Centres (DCs) and Data Centre Parks (Dc Parks).
- **Content Delivery Networks (CDNs):** TRAI has recommended that **CDN players should be registered with DoT** through a simple online registration process.
  - The internet traffic, which was earlier being delivered by ISPs alone, is now being delivered by Internet Service Providers (ISPs) and CDN combined.
- **Interconnect Exchanges Providers (IXPs)**: TRAI has recommended that **a separate authorization in Unified License** may be created for IXPs with terms and conditions that are much less onerous than ISP license authorization.

Telecom Regulatory Authority of India (TRAI)

- **Origin:** The Telecom Regulatory Authority of India (TRAI) was **established on 20th February, 1997 under the Telecom Regulatory Authority of India Act, 1997.**
- **Objectives**: to **regulate telecom services**, including fixation/revision of tariffs for telecom services which were earlier vested in the Central Government.
- **Functions**: to **make recommendations** on various telecom Business in India.
  - The recommendations of the TRAI are **not binding upon the Central Government.**
- **Powers of TRAI: (**Currently has **no powers to penalise** that fails to meet the standards)
  - Order for Furnishing Information
  - Appointments for Inquiry
  - Order for Inspection
  - Issue Directions to Service Providers
- **Composition of TRAI**: consists of a **Chairperson, two whole-time members and two part-time members**, all of which are **appointed by the Government of India.**
  - **Tenure of Members**: Chairperson and other members shall hold their office for a t**erm of three years or till the age of 65 years**, whichever is earlier.
  - **Removal of Members**: The **Central Government is empowered to remove any member of the TRAI**, if he/she:
    - has been adjudged an insolvent
    - has been convicted of an offence which involves moral turpitude
    - has become physically or mentally incapable of acting as a member
    - has abused his/her position, rendering his/her continuance in office prejudicial to the public interest.

DST

Nov 19

PNIPAM POLYMER

(Syllabus: GS Paper 3 - Sci & Tech)

Intriguing flow behaviour changes of temperature-responsive polymer can impact their use in electrical energy storage devices

Context: Scientists have found intriguing changes in the flow behaviour of colloidal suspension of **a temperature-responsive polymer called PNIPAM (poly (N-isopropylacrylamide))** used in gels, microgels, membranes, sensors, biosensors, and thin films when subjected to large deformations.

Polymer

- **About**: A **large molecule or a macromolecule** which essentially is a combination of many subunits.
  - Polymers are all **created by the process of polymerization** wherein their constituent elements, called monomers, are reacted together to form polymer chains.
- **Structure of Polymers**: Most of the polymers around us are **made up of a hydrocarbon backbone.**
  - A Hydrocarbon backbone is a **long chain of linked carbon and hydrogen atoms,** possible due to the tetravalent nature of carbon.
- **Source**:
  - **Natural Polymers**: They **occur naturally and are found in plants and animals**. For example, proteins, starch, cellulose, and rubber. To add up, we also have biodegradable polymers called biopolymers.
  - **Semi-synthetic Polymers**: They are **derived from naturally occurring polymers** and undergo further chemical modification. For example, cellulose nitrate, and cellulose acetate.
  - **Synthetic Polymers:** These are m**an-made polymers**. Plastic is the most common and widely used synthetic polymer. It is used in industries and various dairy products. For example, nylon-6, 6, polyether's etc.
- **Properties of Polymers:**
  - As chain length and cross-linking increase, the **tensile strength of the polymer increases.**
  - Polymers **do not melt**, and they change state from crystalline to semi-crystalline.
  - **Ability to change their refractive index** with temperature.
    - Refractive Index (Index of Refraction) is a **value calculated from the ratio of the speed of light in a vacuum** to that in a second medium of greater density.
- **Uses of polymers in everyday life:**
  - Polypropene finds usage in a broad range of industries such as **textiles, packaging, stationery, plastics, aircraft, construction, rope, toys, etc.**
  - Polystyrene is one of the most common **plastic** actively used in the packaging industry.
  - Bottles, toys, containers, trays, **disposable** glasses and plates, tv cabinets and lids are some of the daily-used products made up of polystyrene.
  - The most important use of **polyvinyl chloride** is the manufacture of sewage pipes.
  - It is also used as an **insulator** in electric cables.
  - Polyvinyl chloride is **used in clothing and furniture** and has recently become popular for the construction of doors and windows as well.
  - It is also used in **vinyl flooring**.
  - Urea-formaldehyde resins are **used for making adhesives**, moulds, laminated sheets, unbreakable containers, etc.
  - Glyptal is **used for making paints**, coatings, and lacquers.
  - Bakelite is **used for making electrical switches**, kitchen products, toys, jewellery, firearms, insulators, computer discs, etc.

DTE

Nov 19

MALARIA

(Syllabus: GS Paper 3 - Sci & Tech)

HEALTH IN AFRICA

WHO launches new strategy to tackle antimalarial drug resistance in Africa

Some 96% malaria infections and fatalities worldwide in 2020 were from sub-Saharan Africa

NEXT NEWS >

By Arya Rohini
Published: Friday 18 November 2022



Context: The World Health Organization has launched a new strategy to combat antimalarial drug resistance in Africa November 17, 2022.

Key Points

- Some recent reports from Africa indicated growing parasite resistance to **artemisinin** - the major component of malaria drugs.
  - Full-blown treatment failure could result in very dangerous outcomes, given Africa's overwhelming reliance on artemisinin-based combination therapies (ACT).
- The **new strategy builds on the knowledge from earlier** and current global programmes.
- It **aims to reduce the threat and effects** of antimalarial drug resistance in Africa through four pillars.
  - Strengthening surveillance of antimalarial drug efficacy and resistance.
  - Optimising and regulating diagnostics and therapeutics to limit drug pressure through preemptive measures.
  - Reacting to resistance by limiting the spread of antimalarial drug-resistant parasites
  - Stimulating research and innovation to leverage existing tools and develop new tools against antimalarial drug resistance.
- **Six different ACTs are currently advised by WHO** as first- and second-line treatments for uncomplicated P falciparum malaria.
- **Artemisinin and its derivatives,** isolated from the plant artemisia annua, are **potent medications** renowned for their quick reduction of Plasmodium parasite counts in the blood of malaria patients.
  - **ACTs combine with partner drugs** - artesunate, artemether or dihydroartemisinin. Artemisinin compounds lessen the number of parasites during the first three days of treatment. The partner drug's role is to eliminate the remaining parasites and treat the infection.

Malaria

- **About**: A **mosquito-borne** infectious disease.
- **Causes**: Caused by various species of the **parasitic protozoan microorganisms called Plasmodium.**
  - There are **5 parasite species that cause malaria in human**s, and 2 of these species – Plasmodium falciparum and Plasmodium vivax – pose the greatest threat.
  - **Other causes** are Bitten by a malarial vector (Anopheles stephensi), Use of shared and infected syringes, Organ transplantation , Transfusion and From an infected mother to her baby during birth.
- **Common symptoms**: Fever, fatigue, chills, vomiting, and headaches, Diarrhoea, anaemia and muscle pain, Profuse sweating and convulsions, Bloody stools.
  - In severe cases, **malaria can be devastating**; it can lead to seizures, coma and eventually, death.
- **Prevention of malaria:** There are two ways to deal with malaria - prevent the mosquito bite from happening (i.e. preventative steps) or attack the parasites once they have infected the body.
- **Treatment**: It is **preventable as well as curable.**
- **Vaccine**: The **malaria vaccine, RTS,S,** acts against P. falciparum, the most deadly malaria parasite globally, and the most prevalent in Africa.
  - It was **developed by GlaxoSmithKline** (GSK) company and approved by the European Medicines Agency in 2015.
  - The RTS, S vaccine **trains the immune system to attack the malaria parasite** (Plasmodium (P.) falciparum, the deadliest species of the malaria parasite).

Initiatives to Curb Malaria

- **Global Initiatives:** The WHO has identified 25 countries with the potential to eradicate malaria by 2025 under its 'E-2025 Initiative'.
- **India's Effort:** In India, malaria elimination efforts were initiated in 2015 and were intensified after the launch of the **National Framework for Malaria Elimination (NFME)** in 2016 by the Ministry of Health and Family Welfare.
  - NFME is in line with WHO's Global Technical Strategy for Malaria, 2016-2030, which guides the WHO Global Malaria Programme (GMP), responsible for coordinating WHO's global efforts to control and eliminate malaria.
  - The **National Strategic Plan for Malaria Elimination (2017-22)** was launched in July 2017 which laid down strategies for the following five years.

DTE

Nov 19

AFRICAN SHARPTOOTH CATFISH

(Syllabus: GS Paper 3 - Env & Eco)



Environmental DNA-based assay to detect invasive catfish in waterbodies

North African Sharptooth catfish is one such species that was illegally introduced in India for aquaculture purposes

By India Science Wire
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Alien Invasive Species

- **About**: The alien invasive species are **non-native to an ecosystem**.
  - They may cause economic or environmental harm or even adversely affect human health.
- **Difference between alien and alien invasive species**: An alien species is a species introduced outside its normal distribution.
  - According to experts, alien species become 'invasive' when they are introduced **deliberately or accidentally outside their natural areas**, where they out-compete the native species and upset the ecological balance.
  - E**xotic species are the alien species** which are also known by other names like invasive species, non-indigenous species or bioinvaders. These species grow in a non-native environment.
- **Legal status:** There is **no exclusive legislation** or policy in India to deal with the invasive alien species.
- **Some of the invasive species found in India are**: Alternanthera philoxeroides, Cassia uniflora, Chromolaena odorata, Eichhornia crassipes, Lantana camara, Parthenium hysterophorus, Prosopis juliflora and others.

Context: Invasive alien species are a severe threat to biodiversity, causing local extinction of native species and impacting ecosystem services, human livelihood, economy, and health.

Key Findings

- **African Sharptooth catfish**: The North African Sharptooth catfish is **one such species that was illegally introduced in India** for aquaculture purposes.
  - Now the species has **invaded most freshwater ecosystems**.
- **e-DNA method**: While the conventional methods to detect invasive species, like using nets, traps, and visual observations, are cumbersome, the researchers from Centre for Cellular and Molecular Biology (CSIR-CCMB) now have developed Environmental D**NA (eDNA)-based molecular methods that provide a time and cost-effective alternative.**
  - eDNA is defined as"**genetic material obtained directly from environmental samples** (soil, sediment, water, etc.) without any obvious signs of the biological source material."

African Sharptooth catfish

- **About**: A species of catfish of the **family Clariidae**, the airbreathing catfishes.
- **Scientific name:** Clarias gariepinus.
- **Distribution**: They are **found throughout Africa and the Middle East**, and live in freshwater lakes, rivers, and swamps, as well as human-made habitats, such as oxidation ponds or even urban sewage systems.
  - The African sharptooth catfish was **introduced all over the world** in the early 1980s for aquaculture purposes, so is found in countries far outside its natural habitat, such as Brazil, Vietnam, Indonesia, and India.
- **Habits**: It is a **nocturnal fish** like many catfish.
  - It feeds on **living, as well as dead, animal matter**.
  - African catfish sometimes **produce loud croaking sounds,** not unlike the voice of the crow.
  - Its **ability to survive in shallow mud for long periods of time**, high tolerance to poorly oxygenated water and fast breeding gives it an edge over other native species.
- **IUCN conservation Status**: Least concern.
- **Introduced in India:** African catfish (Clarias gariepinus) is a **carnivorous species** introduced in India without official sanction.
  - Despite a **ban imposed by the union government in 2000,** farming of catfish continues in India.

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