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## In-vitro Fertilisation

**Context:** Alabama Supreme Court's ruling on February 16 equating frozen embryos to children has stirred controversy in the ongoing political debate over reproductive rights in the US, particularly concerning IVF.

### ➤ Overview of IVF:

- In vitro fertilisation, or IVF, is a complex series of procedures aimed at achieving pregnancy.
- It is primarily used as a treatment for infertility, defined as the inability to conceive after at least a year of trying for most couples.
- Additionally, IVF can be employed to prevent the transmission of genetic disorders to offspring.

### ➤ IVF Procedure:

- During IVF, mature eggs are retrieved from the ovaries and fertilised with sperm in a laboratory setting.
- Fertilised eggs, known as embryos, are then transferred to the uterus for implantation.
- A full cycle of IVF typically spans 2 to 3 weeks, although it may extend longer depending on specific circumstances.

### ➤ Assisted Reproductive Technology:

- IVF is the most effective form of assisted reproductive technology, involving manipulation of eggs, embryos, and sperm.

### ➤ IVF Options:

- IVF can utilise a couple's own eggs and sperm or involve reproductive material from donors.
- In some cases, a gestational carrier may carry the embryo to term.

### ➤ Factors Affecting IVF Success:

- Success rates of IVF vary based on factors such as age and underlying infertility causes.
- IVF procedures can be time-consuming, expensive, and invasive.
- Multiple pregnancies may occur if more than one embryo is implanted.

### ➤ Indications for IVF:

- IVF is indicated for various conditions, including fallopian tube damage, ovulation disorders, endometriosis, uterine fibroids, and previous surgeries preventing pregnancy.
- It is also employed in cases of unexplained infertility or genetic disorders.

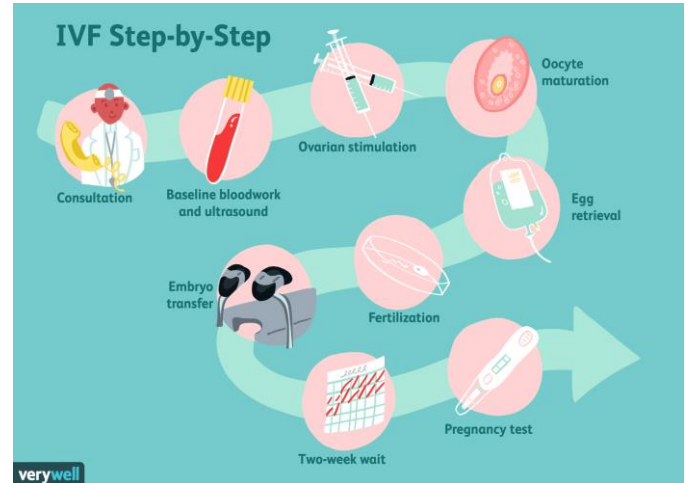
### ➤ Preservation of Fertility:

- IVF offers options for preserving fertility in individuals facing cancer treatment or other health conditions.
- Eggs or embryos can be harvested and frozen for future use.

### ➤ Risks Associated with IVF:

- Risks include stress, complications from egg retrieval procedures, ovarian hyper-stimulation syndrome,

miscarriage, ectopic pregnancy, multiple pregnancies, birth defects, premature delivery, low birth weight, and a potential association with certain cancers.



## Advance Pricing Agreements

**Context:** In FY 2023-24, CBDT sealed 125 APAs with Indian taxpayers, marking a record achievement in tax agreements.

- In FY 2023-24, there were 86 Unilateral APAs (UAPAs) and 39 Bilateral APAs (BAPAs), the highest ever recorded.
- This fiscal year saw a 31% increase in APA signings compared to the previous year's 95 APAs.
- The total number of APAs since the inception of the programme is now 641, with 506 UAPAs and 135 BAPAs.
- FY 2023-24 also saw the highest number of BAPAs signed to date.
- BAPAs were established through Mutual Agreements with India's treaty partners: Australia, Canada, Denmark, Japan, Singapore, the UK, and the US.

### ➤ About APAs:

- **Definition:** An APA is a formal agreement between a taxpayer and a tax authority that outlines the pricing methodology for international transactions between related companies, aiming to prevent disputes over pricing.
- **Example:** Company A in India selling to its US subsidiary, Company B, can establish an APA with both Indian and US tax authorities to agree on pricing for these transactions, ensuring clarity.
- **Objective:** APAs aim to regulate multinational companies, preventing tax evasion by ensuring fair profits based on the arm's length principle in inter-corporate transactions.
- **Guidelines:** APAs are governed by provisions in the Income Tax Act, 1961, particularly in relation to

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transfer pricing—pricing for goods, finance, or services provided between related companies.

- **Types of APAs:** APAs can be unilateral (with one tax authority), bilateral (involving two tax authorities), or multilateral (involving multiple tax authorities).
- **Benefits:** APAs offer certainty in tax liability, streamline audit tasks, and reduce administrative costs for tax authorities.
- **Timeframe:** APAs determine arm's length prices for international transactions for up to five future years, with an option to roll back for four preceding years, providing a total of nine years of tax certainty.
- **Application Process:** Taxpayers file applications for unilateral APAs with the Directorate General of Income Tax (DGIT), while bilateral or multilateral APAs involve negotiations between competent authorities of the relevant tax jurisdictions.

## Space Debris

**Context:** ISRO Chairman S. Somanath declared India's aim for debris-free space missions by 2030.

- **Space Debris Definition:** Refers to defunct human-made objects in Earth's orbit, including derelict spacecraft, abandoned stages, and fragments from collisions.
- **Size and Numbers of Debris:**
  - As of January 2019, over 128 million debris pieces smaller than 1 cm and approximately 900,000 pieces between 1 and 10 cm were estimated.
  - Large debris, defined as 10 cm across or larger, numbered 34,000 in 2019 and at least 37,000 by June 2023.
  - In 2020, there were 8,000 metric tons of debris in orbit, with expectations of further increases.
- **Low Earth Orbit (LEO):**
  - LEO, below 2,000 km orbital altitude, traditionally had few universal orbits, but this is changing with the deployment of satellite internet constellations.
  - LEO is densely populated with satellites, including Sun-synchronous and polar orbits, resulting in frequent approaches between objects.

- Gravitational perturbations and collisions pose risks, with impact speeds averaging 10 km/s and potential for collisions from any direction.

### ➤ **Kessler Syndrome and Long-term Effects:**

- The Kessler syndrome, a cascade effect of collisions, could render certain low Earth orbits unusable due to increased debris density.
- Crewed missions operate mostly below 400 km altitude, where air drag helps clear fragments, though the upper atmosphere's density varies.

### ➤ **Higher Altitudes:**

- Orbital decay at higher altitudes takes longer due to reduced air drag, with various factors contributing to debris migration to lower altitudes.
- Geostationary orbits (GEO) pose collision risks, particularly for derelict satellites, though collision debris in GEO orbits pose less immediate risk compared to LEO.
- Efforts to move satellites out of their orbital slots at the end of their lifespan face challenges, and collisions in higher altitudes have occurred.

### ➤ **Inter-Agency Space Debris Coordination Committee (IADC):**

- The IADC is an international governmental forum aimed at coordinating activities related to both man-made and natural debris in space.

### ➤ **Member Agencies of the IADC:**

- ASI (Agenzia Spaziale Italiana)
- CNES (Centre National d'Etudes Spatiales)
- CNSA (China National Space Administration)
- CSA (Canadian Space Agency)
- DLR (German Aerospace Center)
- ESA (European Space Agency)
- ISRO (Indian Space Research Organisation)
- JAXA (Japan Aerospace Exploration Agency)
- KARI (Korea Aerospace Research Institute)
- NASA (National Aeronautics and Space Administration)
- ROSCOSMOS (State Space Corporation)
- SSAU (State Space Agency of Ukraine)
- UK Space Agency

- **IADC Structure:** The IADC comprises a Steering Group and four specified Working Groups, covering measurements (WG1), environment and database (WG2), protection (WG3), and mitigation (WG4).

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## NEWS IN BETWEEN THE LINES

### INS Talwar



Recently, Indian Naval frigate *INS Talwar* on deployment in the Western Arabian Sea for maritime security operations under the ambit of the Bahrain-based Combined Maritime Forces (CMF) apprehended a suspicious dhow recently and recovered 940 kg of narcotics.

#### About INS Talwar:

- The INS Talwar is a **guided missile frigate** and the **first ship in the Talwar-class** of the Indian Navy.
- It was commissioned into the Indian Navy on **June 18, 2003** and is affiliated with the **16th Cavalry of the Indian Army**.
- The Talwar-class frigates are a series of ships **developed by Russia** for the Indian Navy.
- It is **124.8 meters long**, has a **speed of 56 kilometers per hour** and a range of 7,810 kilometers.
- It is equipped with **anti-air operations, anti-ship/land-attack missiles** and anti-submarine warfare.
- It has been deployed around the Indian Ocean and has participated in several exercises, including **Malabar 2008** with the United States Navy and **Cutlass Express 2021** with the French Navy.
- India joined the **Combined Maritime Forces (CMF)** in July 2022 with the objective of bolstering security, stability, and prosperity in the Indian Ocean Region (IOR), aligning with its broader maritime strategy.
- Besides operational deployments, INS Talwar **engages in bilateral exercises** and **capacity-building operations**, exemplified by its participation in Operation Southern Readiness conducted in **Seychelles**.

### Jhelum River



Recently, amidst torrential rains in the Kashmir Valley, a tragic boat capsized occurred in the Jhelum river, resulting in the loss of six lives, including minors.

#### About the Jhelum River:

- The Jhelum River is a **tributary of the Indus River** that flows through India and Pakistan.
- It is the **largest and westernmost of the five rivers of the Punjab region**, which merge with the Indus River in eastern Pakistan.
- It **originates from a deep spring in Verinag at Anantnag**, which is in the Indian-administered Kashmir region.
- It **flows through Srinagar and Wular Lake** before entering Pakistan-administered Kashmir.
- This river **joins the Chenab River near Trimmu, Pakistan**.
- The Jhelum River's major tributaries include the **Kishenganga (Neelum) River, Kunhar River, Sandran River, Bringi River** and others, which contribute to its flow and hydrological system.

### International Monetary Fund



Recently, the International Monetary Fund (IMF) raised India's Gross Domestic Product (GDP) growth projection to 6.8 percent for the financial year (FY) 2024-25.

#### About the International Monetary Fund:

- The International Monetary Fund (IMF) is an **international organization** founded in **1944** at the **Bretton Woods Conference**.
- It currently consists of **190 member countries**.
- It **provides financial assistance to member countries** facing balance of payments problems, typically with conditions for economic reform.
- It played a crucial role in responding to various global economic crises, including the **1997 Asian financial crisis** and the **global economic crisis of 2008**.
- Its headquarter is in **Washington, D.C.**
- India is a founding member** of the International Monetary Fund.

### NITI Aayog



Recently, NITI Aayog Member Ramesh Chand forecasted that the agriculture and allied sectors are poised to achieve over 6% growth in the fiscal year 2024-25.

#### About NITI Aayog:


- The National Institution for Transforming India (NITI Aayog) is a **policy think tank** and **government organization** that advises the Indian government on policies and programs.
- It was **established in 2015 to replace the Planning Commission**.
- It is based on the 7 pillars of effective governance-**Pro-People, Pro-Activity, Participation, Empowering, Inclusion of all, Equality and Transparency**.
- The composition of NITI Aayog includes the **Prime Minister as Chairperson, the Vice-Chairperson appointed by the Prime Minister, a Governing Council comprising Chief Ministers of all states and Lt. Governors of Union Territories**,
- Additionally, it consists of a Regional Council addressing specific regional issues chaired by the Prime Minister or his nominee, **ad hoc membership from leading research institutions, ex-officio**

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	<p>membership of up to four members from the Union council of ministers nominated by the Prime Minister, a Chief Executive Officer appointed by the Prime Minister, and special invitees nominated by the Prime Minister, consisting of experts and specialists with domain knowledge.</p> <ul style="list-style-type: none"> <li>NITI Aayog has launched various initiatives and campaigns, such as: <b>Atal Innovation Mission (AIM)</b>, <b>Startup India</b>, <b>Digital India</b>, <b>Transforming Urban India</b> (AMRUT, Smart Cities Mission), <b>Sustainable Development Goals (SDGs)</b> localization, etc.</li> </ul>
<p><b>Place in News</b></p> <p><b>Armenia</b></p>	<p>Recently, Armenia accused Azerbaijan of "completed ethnic cleansing" in Nagorno-Karabakh at the UN top court, countered by Baku as "cherry-picking," amid their ongoing legal clash at the International Court of Justice.</p> <p><b>Armenia: (Capital: Yerevan)</b></p> <p><b>Location:</b> Armenia is a landlocked country situated in the Armenian Highlands of West Asia.</p> <p><b>Political Boundaries:</b> Armenia shares its borders with <b>Azerbaijan</b> (East), <b>Turkey</b> (West), <b>Georgia</b> (North) and <b>Iran</b> and the <b>Azerbaijani exclave of Nakhchivan</b> (South).</p> <p><b>Physical Features:</b></p> <ul style="list-style-type: none"> <li>The highest point in Armenia is <b>Mount Aragats</b>.</li> <li>Armenia's major rivers include the <b>Aras</b>, <b>Debed</b>, <b>Hrazdan</b>, and <b>Vorotan</b>, each playing significant roles in the country's geography and water resources.</li> <li>Armenia possesses various minerals, including <b>copper</b>, <b>molybdenum</b>, <b>gold</b>, etc.</li> </ul> <p><b>Membership:</b> Armenia is a member of various international organizations, including the <b>United Nations</b>, the <b>Commonwealth of Independent States (CIS)</b> and the <b>Collective Security Treaty Organization (CSTO)</b>.</p> 

## POINTS TO PONDER

- What wildlife species in Mudumalai Tiger Reserve (MTR) recently experienced severe exfoliating mixed skin infections? – **Indian Wild Dogs (Dholes)**
- Where did the 23rd session of the UN Permanent Forum on Indigenous Issues recently begin? – **New York, United States**
- Which state recently approached the Supreme Court seeking relief against the Centre regarding the release of financial assistance from the National Disaster Response Fund (NDRF) for drought management? – **Karnataka**
- Jiadhal River's flow is currently facing disruption due to climate change, according to recent reports. Where does the Jiadhal River meet the Brahmaputra? – **The Jiadhal River flows through Assam and meets the Brahmaputra near Majuli Island.**
- Recently, it has been seen that the water levels have dropped to 13% of its capacity in Lake Kariba, due to an El Niño-induced drought. Between which two countries does Lake Kariba lie? – **Lake Kariba is situated between Zambia and Zimbabwe.**

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