Today's Prelims Topics

Experts on GM crop panels to declare conflict of interest

Context

The Union Ministry of Environment, Forest and Climate Change has amended the rules governing the selection of experts to the Genetic Engineering Appraisal Committee.

About Genetic Engineering Appraisal Committee (GEAC)

- GEAC is a **statutory committee** constituted under the "Rules for the Manufacture, Use/Import of Genetically Engineered Organisms or Cells (Rules, 1989)" framed under **Environment (Protection) Act, 1986.**
- **Nodal Ministry:** Ministry of Environment, Forest and Climate Change (MoEF&CC)
- **Function:**
  - Responsible for appraisal of proposals relating to release of genetically engineered (GE) organisms and products into the environment including experimental field trials.
  - It keeps a check on the use, import and export of genetically modified (GM) organisms and crops.
  - **Clearance of GEAC is mandatory** for the environmental release of GM crops.
- **Composition:**
  - It is chaired by the Special Secretary/Additional Secretary of MoEF&CC and co-chaired by a representative from the Department of Biotechnology (DBT).
  - **Members:** 24
  - GEAC **meets every month** to discuss the proposals.

Key Changes to GEAC Expert Selection Rules

- **Disclosure of Conflict of Interest**
  - Expert members must disclose any potential conflicts of interest that could impact their decision-making.
  - Necessary steps must be taken by the expert to ensure impartiality in decisions.
  - Members with a direct or indirect association with matters being discussed must declare this before meetings.
- **Recusal from Discussions**
  - Unless specifically requested by the committee, members with conflicts are expected to recuse themselves from relevant discussions.
- **Mandatory Professional Disclosure**
  - Selected members are required to submit a form detailing their professional affiliations **from the previous decade.**

UPSC PYQ

Q. The Genetic Engineering Appraisal Committee is constituted under the **(2015)**

(a) Food Safety and Standards Act, 2006
(b) Geographical Indications of Goods (Registration and Protection) Act, 1999
(c) Environment (protection) Act, 1986
(d) Wildlife (Protection) Act, 1972

Answer: C

Source:
- **The Hindu - Experts on GM crop panels to declare conflict of interest**

Indian researchers develop injectable hydrogel for targeted cancer treatment

Context
Researchers from IIT Guwahati, in collaboration with Bose Institute Kolkata, have developed an injectable hydrogel aimed at revolutionizing breast cancer treatment.

Key Features of the Injectable Hydrogel
- **Innovative Design**
  - Composed of ultra-short peptides, which are biodegradable and biocompatible.
  - The hydrogel remains stable at the injection site, ensuring localized treatment.
  - Activates in response to elevated glutathione (GSH) levels, a molecule found in high concentrations in tumor cells.
- **Precision Drug Delivery**
  - Releases anti-cancer drugs in a controlled manner, targeting cancer cells while sparing healthy cells.
  - Minimizes systemic side effects associated with traditional chemotherapy.

About Hydrogels
- Hydrogels are **three-dimensional, hydrophilic polymer** networks that can retain a large amount of water while maintaining structure due to their cross-linked nature.
- They are soft and flexible, similar to natural tissue, due to their significant water content.
- **Composition:** Hydrogels can be made from natural or synthetic polymers, such as collagen, gelatin, polyethylene glycol (PEG), cellulose, starch, chitin and chitosan.
- **Applications:**
  - **Tissue engineering:** Hydrogels can be used as scaffolds for tissue engineering because their structure is similar to the extracellular matrix of many tissues.
  - **Wound healing:** Hydrogels are a common wound care solution because they are soft, moisturising and can quickly absorb and retain water.
  - **Drug delivery:** Hydrogels can be loaded with drugs and controlled subcutaneously, orally or intramuscularly.
  - **Environmental Cleanup:** They are also used to capture and remove pollutants, especially in water.
  - **Agriculture:** Used to retain soil moisture, especially in arid regions.
  - They are also used in **Contact lenses & Diagnostic devices.**

UPSC PYQ

Q. In which of the following are hydrogels used? **(2024)**
1. Controlled drug delivery in patients
2. Mobile air-conditioning systems
3. Preparation of Industrial lubricants

Select the correct answer using the code given below:
(a) 1 only
(b) 1 and 2 only
(c) 2 and 3 only
(d) 1, 2 and 3
Answer: D

Source:
- **The Hindu - Indian researchers develop injectable hydrogel for targeted cancer treatment**

Obesity: soft core of an epidemic of non-communicable diseases

Context

Obesity and overweight are causing over **3.4 million deaths every year worldwide.**

About Obesity

- Obesity is a chronic disease that occurs when the body stores excess calories as fat
- It is caused by an **imbalance of calories consumed and calories expended** (when someone eats too many high-fat or high-sugar foods and doesn't get enough physical activity).
- **Other factors:** Certain medications, such as antidepressants, steroids and diabetes medications, Lack of sleep, Stress & Genetics.
- A **body mass index (BMI) of over 30 indicates obesity.**
- **Potential Health Problems caused due to Obesity:** Stroke, Type 2 diabetes, High blood pressure, High cholesterol, Sleep apnea, Certain cancers etc.
- **Government Efforts to tackle Obesity:**
  - **Eat Right India:** A campaign from the Food Safety and Standards Authority of India (FSSAI) that promotes healthy eating habits. The campaign has three pillars:
    - **Eat Safe:** Promotes safe and hygienic food .
    - **Eat Healthy:** Promotes diet diversification and fortification
    - **Eat Sustainable:** Promotes conservation of water resources, eating local and seasonal foods.
  - **Fit India Movement , POSHAN Abhiyan, Mid day meal Scheme etc.**

Obesity Stats
- **Global:**
  - **1 in 8 people** is living with obesity.
  - **890 million adults and 160 million** adolescents are affected by it.
  - **37 million children under 5 years old** are overweight & **390 million children aged 5-19 years** are overweight.
- **India:**
  - **13% obesity rate,** higher than other middle-income countries.
  - India ranks **3rd** globally in obesity prevalence, after **China and USA.**
  - India ranks **2nd globally** in **obese children.**

Source:
- **The Hindu - Obesity: soft core of an epidemic of non-communicable diseases**

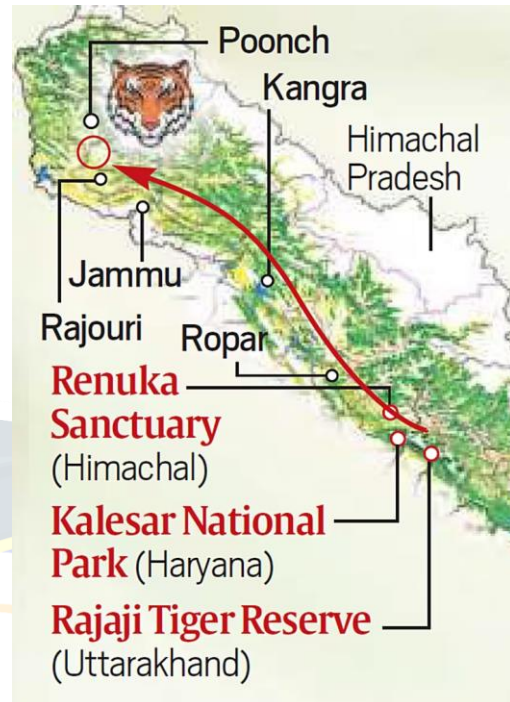# Did Rajaji tiger walk 500 km to Jammu?

Context

A young male tiger that left Rajaji Tiger Reserve in November 2022 was later found at Renuka Wildlife Sanctuary in Himachal Pradesh after passing through Haryana's Kalesar National Park. It was recently seen by the Army patrol party near the Line of Control (LoC) in Rajouri, Jammu.

About Rajaji Tiger Reserve

- It is spread over **3 districts (Dehradun, Haridwar, Pauri Garhwal) of Uttarakhand.**
- It is situated along the **hills and foothills of the Shiwalik ranges**.
- In **1983** Rajaji Wildlife Sanctuary was merged with **Motichur and Chilla wildlife sanctuaries** to create **Rajaji National Park.**
- **Rivers: Ganga** & its tributary **Song** flow through the reserve.
- It has an **elephant corridor (Chilla-Motichur)** which facilitates the movement of elephants between **Rajaji and Corbett National Park.**
- **Flora:** Covered with diverse forest types ranging from semi-evergreen to deciduous.
- **Fauna:** Tiger, Asian Elephants, Leopard, Jungle cat, Himalayan Black Bear, Sloth Bear, Striped Hyena, Goral etc. **Large numbers of butterflies and small birds** are also observed.

Source:

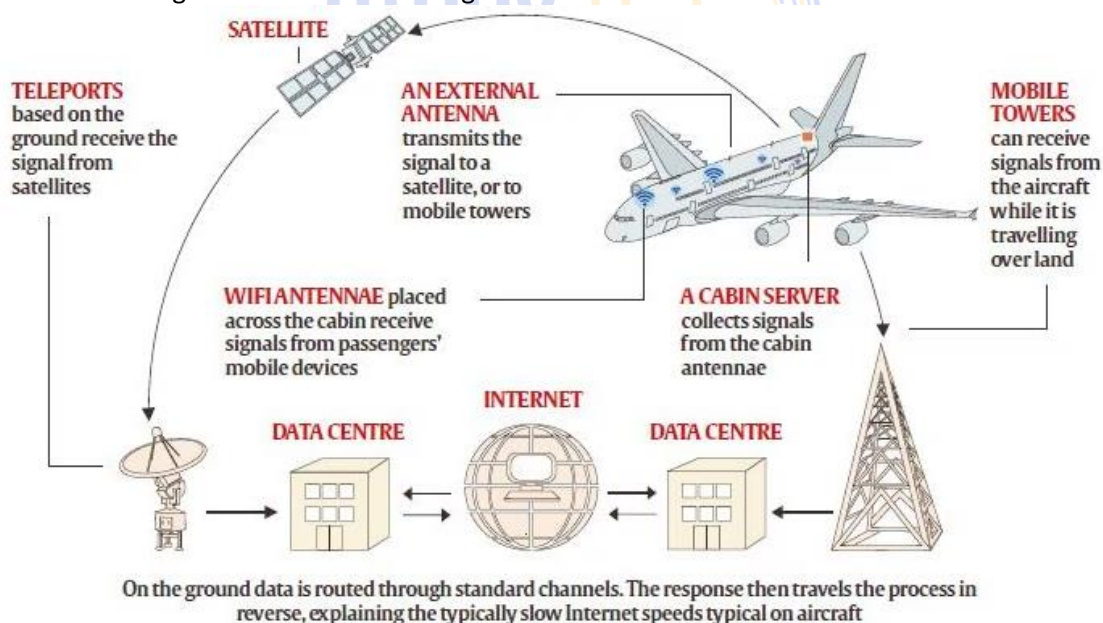- **Indian Express - Rajaji tiger walk 500 km to Jammu**

How In-flight Internet Works ?

Context
Air India has announced the rollout of Wi-Fi Internet connectivity services on select domestic and international flights. It is the **1st Indian airline** to offer Internet connectivity **on domestic flights.**

Technologies Behind In-Flight Wi-Fi
- **Air-to-Ground (ATG) Technology:**
  - Uses cellular towers on the ground.
  - Signals are picked up by an antenna beneath the aircraft.
  - **Limitations:** Connectivity may be interrupted over large water bodies or unpopulated areas without towers.
- **Satellite-Based Connectivity**:
  - Relays signals between ground stations and satellites via an antenna on the aircraft's body.
  - Offers wider coverage, especially useful over remote areas without cellular towers.
- **Process:**
  - Signals from passengers' devices are picked up by in-cabin Wi-Fi antennas.
  - These signals are routed to an on-board server.
  - From the server, signals are transmitted to either satellites (for satellite-based connectivity) or ground towers (for ATG).
- **Aircrafts that offer Wi-Fi:** Airbus A350, Boeing 787-9 and Airbus A321neo.
- **Challenges:**
  - Installing Wi-Fi antennae involves significant costs. Air India is undergoing a **$400-million retrofit programme** to upgrade its older planes with Wi-Fi hardware.
  - In-flight Wi-Fi is **slower** than ground-based Internet.

SATELLITE

TELEPORTS based on the ground receive the signal from satellites

AN EXTERNAL ANTENNA transmits the signal to a satellite, or to mobile towers

MOBILE TOWERS can receive signals from the aircraft while it is travelling over land

WIFI ANTENNAE placed across the cabin receive signals from passengers' mobile devices

A CABIN SERVER collects signals from the cabin antennae

INTERNET

DATA CENTRE

DATA CENTRE

On the ground data is routed through standard channels. The response then travels the process in reverse, explaining the typically slow Internet speeds typical on aircraft

Source:
- **Indian Express - a look at how in-flight Internet works**

Winter Char Dham Circuit

Context
The Uttarakhand government has inaugurated the **Winter Char Dham Circuit** to attract tourists during the off-season winter months.

About Winter Seats of the Char Dham
- During winter, heavy snowfall makes the main Char Dham shrines inaccessible.
- The presiding deities are moved to **lower-altitude shrines**, designated as their winter abodes:
  - **Gangotri Dham:** Mukhba (Uttarkashi).
  - **Yamunotri Dham:** Kharsali (Uttarkashi).
  - **Kedarnath:** Omkareshwar Temple (Ukhimath, Rudraprayag).
  - **Badrinath:** Pandukeshwar (Chamoli).
- **Economic significance:** The Char Dham pilgrimage contributes significantly to Uttarakhand's economy, generating more than **₹200 crore daily** during the peak season. The winter Char Dham aims to extend economic benefits into the off-season by attracting more tourists.
- **Environmental and Management Concerns:**
  - **Overcrowding and Infrastructure Strain:** Increased footfall strains local infrastructure and disrupts fragile ecosystems.
  - **Impact on Wildlife:** Animals such as snow leopards, mountain sheep descend to lower altitudes during winter for food and water, Winter tourism can disturb these shy species.
  - **Public Health Risks:** Harsh weather and challenging terrain in mountain areas raise concerns about safety, security, and public health for pilgrims and tourists.

Source:
- **Indian Express - What is the winter Char Dham**

Palla's Cat

Context

The first photographic evidence of Pallas's cat was found during a snow leopard survey recently in Himachal Pradesh.

About Palla's Cat

- It is named after **Peter Simon Pallas, who first described it in 1776.**
- **Distribution: It is native to Central Asia**, with its range extending to western Iran, Mongolia, China, Russia, Kazakhstan and Kyrgyzstan.
- **Features:**
  - It has **dense, silvery-grey fur and a flat face with rounded ears.**
  - It is solitary and elusive, active mainly at night (nocturnal).
  - **Habitat:** Lives in rocky steppes and cold deserts, at altitudes of up to 5,000 meters.
  - Feeds on small mammals, birds and insects.
- Conservation Status:
  - **IUCN:** Least Concern
  - **CITES:** Appendix II

Source:

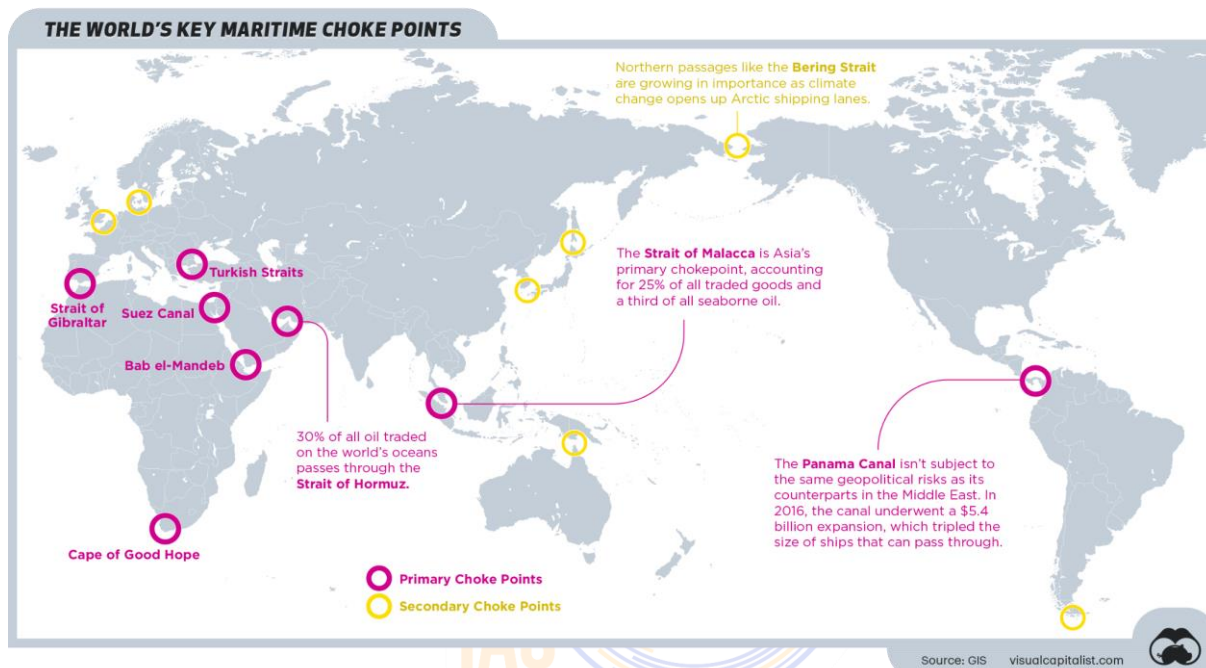- **The Hindu - Pallas's cat find its way into textbook**

Panama Canal

Context

Recently U.S. President-elect **Donald Trump** called the transfer of the Panama Canal to Panama a "foolish" decision and demanded its return to the U.S.

About Panama Canal

- It is an **80-kilometer artificial waterway** connecting the Atlantic and Pacific Oceans **through the Isthmus of Panama.**
- It is a **lock-type canal** owned and administered by Panama.
- It is one of the **major choke points of the world.** It handles the **6% maritime trade volume of the world.**

Why is Trump upset with Panama?

- **High Transit Fees:** The Panama Canal Authority (ACP) increased transit fees for U.S. vessels.
  - In 2023, a severe drought in **Lakes Gatun and Alhajuela,** which supply water to operate the canal's locks, reduced the canal's shipping capacity by 36%.
  - To compensate for reduced capacity, ACP increased fees, affecting U.S. vessels heavily reliant on the canal for trade.
- **Increased Chinese Presence:** Since 2017, when Panama became the first Latin American country to join China's Belt and Road Initiative (BRI), Chinese investments in the canal have grown.

US - Panama Treaty

- It is also known as the **Torrijos–Carter Treaties,** was signed in **1977** by the United States and Panama to transfer control of the Panama Canal to Panama.
- It was transferred to **Panama in December, 1999.** Panama took full responsibility for operating, managing and maintaining the canal after the transition.
- **Permanent Neutrality Treaty**: Declared the canal neutral and open to vessels of all nations. It also gave the U.S. the right to defend the canal's neutrality and prioritize passage in military emergencies.

Source:

- **The Hindu - Why has Trump called the Panama treaty 'foolish'?**

Editorial Summary

Should voter ID be linked with Aadhaar to combat voter fraud?

Context
On December 29, 2024, the Aam Aadmi Party (AAP) and Bharatiya Janata Party (BJP) accused each other of manipulating Delhi's electoral rolls.

More in News
- Allegations of election fraud, such as deliberate name deletions and booth capturing.
- Claims of tampering with electronic voting machines (EVMs), including misuse after polling hours.

Aadhaar's Role and Features
- **Unique Identification**: Aadhaar assigns a unique number to every individual.
- **Real-Time Authentication**: Aadhaar offers online authentication.
- **Limitations**: Aadhaar is not proof of citizenship and can be issued to lawful non-residents. It does not directly establish voting rights.

National Electoral Roll Purification and Authentication Programme (NERPAP), 2015
- **Launched by**: Election Commission of India.
- **Objective**: To create an error-free and authenticated electoral roll by linking the Elector's Photo Identity Card (EPIC) with the Aadhaar number of registered voters.
- However, the implementation of NERPAP faced challenges, particularly following an interim order by the Supreme Court of India on August 11, 2015, which put the program on hold due to concerns about privacy and data misuse.

Benefits of Linking Aadhaar with Voter IDs
- **Elimination of Duplicate Voter IDs**: Migration or address changes often lead to duplicate voter registrations. Linking can identify and eliminate such duplicates.
  - This was experimented with biometric data collection in Goa but was discontinued when Aadhaar was introduced.
- **Curbing Proxy Voting**: Aadhaar's authentication can prevent impersonation during voting.
- **Transparency in Electoral Rolls**: Ensures that one person has only one voter ID.
  - Helps identify errors or deliberate manipulation of rolls.

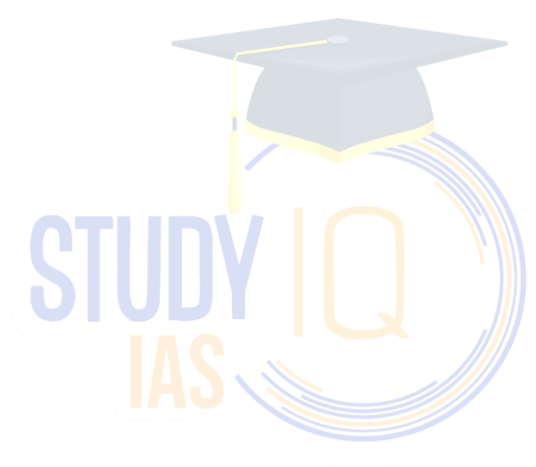### Concerns Associated with Linking Aadhaar with Voter IDs
- **Privacy and Data Security:** Aadhaar contains sensitive biometric data, and linking it to voter IDs could raise concerns about unauthorized access or misuse.
- **Exclusion Risks:** Technical errors, lack of Aadhaar availability, or mismatched data could lead to genuine voters being disenfranchised.
- **Not a Proof of Citizenship:** Aadhaar can be issued to non-citizens legally residing in India, making it unsuitable as sole verification for voter eligibility.
- **Potential for Misuse:** Linking Aadhaar could inadvertently allow access to voter details by political parties, leading to targeted campaigning or unsolicited communication.
- **Human and Systemic Errors:** Errors in the Aadhaar database (e.g., incorrect entries) may result in discrepancies when linked with voter rolls.
- **Lack of Legal Clarity:** The legal framework for Aadhaar's usage in the electoral process needs to be robust to avoid misuse and ensure compliance with privacy laws.

Way Forward

- **Technology's Role**: Aadhaar can address technical issues like duplication.
- **Human and Institutional Integrity**: Addressing political and administrative misconduct is critical.
- **ECI's Responsibility**: Proactive communication and action to dispel doubts and strengthen public trust in the electoral process.

Source:

- **The Hindu: Should voter ID be linked with Aadhaar to combat voter fraud?**

Cash Transfer Policy Ahead Delhi Election

Context

The controversy over AAP's cash transfer promises (Delhi's Mahila Samman Yojna) ahead of the Delhi elections prompts a debate on whether such schemes represent genuine welfare initiatives or are driven by short-term transactional politics.
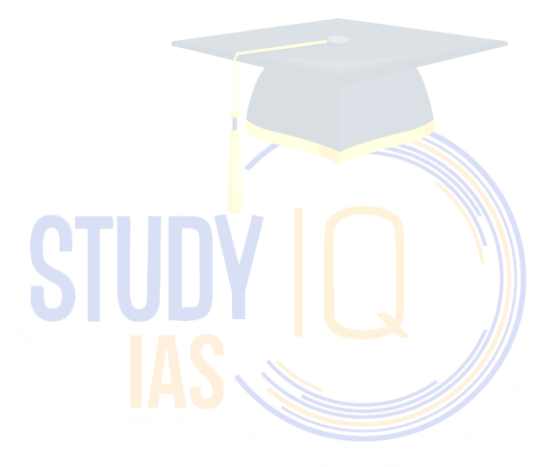
What are the Arguments For and Against the Cash Transfer Policy?

Aspect	Arguments For	Arguments Against
Fiscal Impact	- Provides immediate financial relief to vulnerable populations. - Boosts purchasing power and stimulates local economies.	- Imposes a significant fiscal burden, diverting funds from long-term investments like infrastructure and healthcare. - May lead to underfunding of critical public services like education and sanitation.
Dependency	Acts as a safety net for households without stable incomes.	- Risks creating a culture of dependency, discouraging employment and entrepreneurial efforts. - May undermine work ethic and skill development.
Inflationary Pressures	Increases demand, potentially spurring economic growth.	Could lead to localized inflation and erode the purchasing power of cash transfers.
Addressing Socio-Economic Issues	- Directly tackles immediate challenges like poverty and unemployment. - Promotes social equity by targeting marginalized groups.	- Offers short-term relief but fails to address structural issues like lack of quality education or job creation. - May oversimplify complex socio-economic problems requiring deeper policy interventions.
Risk of Misuse	Empirical evidence shows recipients typically spend transfers on essentials like nutrition and education.	- Unconditional transfers might be misused on non-essentials or harmful activities (e.g., alcohol, gambling). - Risk of inefficiency in implementation or beneficiary identification.
Electoral and Political Impact	- Demonstrates responsiveness to public needs and fulfills electoral promises. - Enhances political legitimacy and accountability.	- Often introduced close to elections, seen as populist measures aimed at securing votes. - Focus on short-term political gains over long-term stability and growth.
Equity	- Helps build financial independence for women, promoting gender equality. - Supports inclusive growth for marginalized and disadvantaged communities.	- Unconditional transfers might not be targeted effectively, benefitting non-deserving individuals. - Universal schemes risk spreading resources too thin to make a substantial impact.
Economic Opportunity	Provides immediate economic stimulus by boosting consumption.	Diverts resources from alternative investments with higher long-term returns,

Costs			like skill development.
Sustainability	● Leverages existing digital infrastructure for efficient implementation (e.g., DBT). ● Ensures transparency and minimizes leakages by bypassing middlemen.	● Poses long-term sustainability issues without clear exit strategies or sustainable revenue sources. ● May lead to socio-political backlash if phased out.	

Source:

● **Indian Express: Agree/Disagree**

Detailed Coverage

Polarization: A Deep Dive into Its Causes, Evolution, and Impact

Context
The concept of polarization has become a defining characteristic of contemporary American society and politics, particularly following Donald Trump's victory in the 2016 presidential election and his subsequent re-election in 2024.

What is Meant by Polarisation?
● It is used to describe both the division of a society into opposing groups (political polarization), and a social psychological phenomenon (group polarization) whereby people adopt more extreme positions after discussion.

What are the Causes of Polarisation?
● **Identity-Group Politics**: The increasing emphasis on identity-based affiliations has intensified divisions.
   ○ **E.g.,** Various groups rally around specific cultural or racial identities, leading to stronger in-group loyalty and opposition to out-groups (such as Black Lives Matter).
● **Religious and Ethnic Diversity:** Growing diversity can lead to decreased social trust and heightened societal conflicts.
   ○ **E.g.**, In India, religious diversity has sometimes resulted in communal violence and tensions between different ethnic groups (such as Kuki Meitei conflict in Manipur)
● **Income Inequality:** Rising economic disparities can foster feelings of disenfranchisement among lower-income groups.
   ○ **E.g.,** In the United States, growing wealth inequality has been linked to increased support for populist movements that often polarize political discourse.
● **Social Media Platforms:** Social media can create echo chambers that reinforce existing beliefs while isolating users from opposing viewpoints.
   ○ **E.g.**, Platforms like Facebook and Twitter allow users to engage primarily with like-minded individuals, which can lead to more extreme political views and a lack of exposure to differing opinions.
● **Global Scenario:** The absence of a unifying external threat has made internal divisions more pronounced.
   ○ **E.g.**, In many countries, including the U.S., this has led to increased focus on domestic political conflicts rather than international cooperation.

Evolution of Polarisation in India
Post-Independence Era (1947-1960s)
● **Partition and Communal Tensions**: The 1947 partition led to significant Hindu-Muslim violence, sowing seeds of communal distrust.

Rise of Identity Politics (1970s-1990s)
● **Caste-Based Mobilization**: Political parties emerged which focused on rights of marginalised communities and challenging upper-caste dominance.
● **Ram Janmabhoomi Movement**: Political parties gained prominence by advocating for the construction of a Ram temple in Ayodhya, intensifying Hindu-Muslim polarization.

Coalition Era and Regionalism (1990s-2000s)

- **Fragmented Mandate**: No single party secured a majority, leading to coalition governments and regional parties gaining influence, often promoting local identities.
- **Economic Liberalization**: Reforms initiated in 1991 led to economic disparities, contributing to class-based polarization.

Ascendancy of Hindu Nationalism (2010s-Present)
- **Citizenship Amendment Act (CAA) Protests**: The 2019 enactment of the CAA sparked nationwide protests, with critics alleging it discriminated against Muslims, deepening communal divides.
- **Social Media Influence**: Political parties utilized social media to propagate ideologies, sometimes exacerbating polarization through misinformation.

Recent Developments (2020s)
- **Religious Violence**: Incidents of communal violence have been reported, with some attributing the rise to increasing religious polarization.
- **Diaspora Dynamics**: Religious polarization in India has influenced Indian communities abroad, notably in the United States, leading to divisions within the diaspora.

Impacts of Polarization
- **Erosion of Democratic Norms**: Intense polarization can undermine democratic principles, leading to legislative gridlock and challenges in policy implementation. For instance, the U.S. Congress has experienced increased difficulty in passing legislation due to partisan divides.
- **Social Fragmentation**: Polarization exacerbates social divisions, eroding trust among citizens and between the public and institutions. This fragmentation can lead to the dehumanization of opposing groups, increasing the risk of political violence.
- **Legislative Dysfunction**: Partisan politics may slow down the legislative process, resulting in fewer laws being passed and potentially leading to the enactment of more extreme policies when legislation does occur.
- **Economic and Social Welfare Decline**: Polarization can harm consumer welfare and create challenges for individuals in their daily lives, affecting economic stability and social well-being.

Way Forward: Strategies to Mitigate Polarization
- **Promote Inclusive Dialogue**: Encouraging open conversations that include diverse perspectives can help bridge divides. Initiatives like citizens' assemblies have shown promise in fostering understanding and generating collaborative solutions.
- **Electoral Reforms**: Implementing changes such as open primaries or ranked-choice voting can incentivize moderation and reduce partisan extremes. Subsidizing campaigns of moderate candidates may also encourage more centrist political representation.
- **Media Literacy and Responsible Consumption**: Educating citizens on identifying misinformation and promoting critical thinking can mitigate the spread of divisive content. Encouraging the consumption of diverse news sources can also reduce echo chambers.
- **Strengthen Civic Education**: Teaching the principles of democracy, the importance of compromise, and the value of diverse viewpoints from an early age can build a foundation for a more tolerant society.
- **Encourage Cross-Party Collaboration**: Facilitating bipartisan initiatives and highlighting successful cross-party efforts can demonstrate the benefits of cooperation and reduce adversarial perceptions.
- **Address Underlying Socio-Economic Issues**: Tackling economic disparities and social injustices that often fuel polarization can lead to a more equitable society, reducing the appeal of extremist positions.

Sources:

- **The Hindu: Reflections as the world grows more 'polarised'**
- **Beyond Tracibility**
- **Allianz**