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MINISTRY OF SCIENCE AND TECHNOLOGY



MK Yadav Sir

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BUSINESS STANDARD

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TRAVEL & TOURISM DEVELOPMENT INDEX

(Syllabus: GS Paper 3 – Economy)



WEF: Tourism's share in global GDP to return to pre-Covid levels this year

AKSHARA SRIVASTAVA
New Delhi, 21 May

The travel and tourism sector's contribution to global gross domestic product will return to pre-pandemic levels by the end of 2024, according to a new report by the World Economic Forum (WEF) on Tuesday.

This recovery is driven by a considerable increase in worldwide demand, coinciding with more available flights, better international openness, and increased interest and investment in natural and cultural attractions.

India, with a score of 4.25, holds the 39th position and is the only South Asian nation in the top 50 countries on the biannual Travel & Tourism Development Index (TTDI) brought out jointly by WEF and the University of Surrey.

India ranked 54th in the 2019 edition of the index. However, changes made to the index parameters limit its comparability to earlier years.

"India (39th) has the largest travel and tourism sector in South Asia and scores as the TTDI's top lower-middle-income economy," the study analysing 119 nations noted.

"The country is highly price-competitive (18) and boasts competitive air transport (26) and ground and port (25) infrastructure," it further said.

The rise was driven by the country's strong natural (6), cultural (9), and non-leisure (9) resources. India is among the only three countries to score in the top 10 for all the resource pillars.

Moreover, despite a decline compared to 2019, the country still scores well for travel and tourism demand sustainability, on the back of inbound visitors still choosing more sustainable long stays.

The country's overall TTDI score is 2.1 per cent lower than the 2019 levels. This is because, "as with many economies, travel tourism enabling conditions in India have been impacted by global inflationary supply-side trends and declining price competitiveness", the study added.

Air transport and tourist services infrastructure in the country are also yet to recover to 2019 levels.

Compared to 2019, notable areas of improvement include internet and communication technology readiness, health and hygiene, environmental sustainability, and travel and tourism socio-economic impact — "highlighting the country's progress on some of its key enabling gaps", the study said.

The index was topped by the US, followed by Spain, Japan, France, and Australia. West Asia, meanwhile, led the recovery rates for international tourist arrivals, exceeding the 2019 levels by 20 per cent.

The results highlight that high-income economies generally continue to have more favourable conditions for travel and tourism development. Of the top 30 index scorers in 2024, 26 are high-income economies.

FLYING HIGH

Rank	Country	Score
1	US	5.24
2	Spain	5.18
3	Japan	5.09
4	France	5.07
5	Australia	5.00
6	Germany	5.00
7	United Kingdom	4.96
8	China	4.94
9	Italy	4.90
10	Switzerland	4.81
39	India	4.25

Source: 2024 Travel & Tourism Development Index by WEF

Context: A recent World Economic Forum (WEF) report predicts that the travel and tourism sector's contribution to global GDP will return to pre-pandemic levels by the end of 2024.

Travel & Tourism Development Index (TTDI)

- **About:** WEF has developed a Travel & Tourism Development Index (TTDI) which rates countries in terms of their travel readiness.
  - This report is important because it has been developed as the industry standard and is the result of a collaboration between key industry partners and stakeholders.
- **TTDI focuses on five pillars:** Travel and Tourism sector: Enabling environment, Travel & Tourism Policy and Enabling Conditions, Infrastructure, Travel & Tourism Demand Drivers, Travel & Tourism, and Sustainability.
- **India's Status**: India, with a score of 4.25, holds the 39th position and is the only South Asian nation in the top 50 countries. (54th in the 2021).
  - The country is highly price-competitive (18) and boasts competitive air transport (26) and ground and port (25) infrastructure.
  - The rise was driven by the country's strong natural (6), cultural (9), and non-leisure (9) resources. India is among the only three countries to score in the top 10 for all the resource pillars.

World Economic Forum

- **About:** The WEF is a Swiss nonprofit foundation established in 1971, based in Geneva, Switzerland.
- **Initiated by**: German professor Klaus Schwab
- **Recognized by**: Swiss authorities as the international institution for public-private cooperation.
- **Funded by:** WEF is largely funded by its partnering corporations. These are generally global enterprises with annual turnover greater than $5 billion.
- **Mission**: Committed to improving the state of the world by engaging business, political, academic, and other leaders of society to shape global, regional, and industry agendas.
- **Some major reports published by WEF are:** Energy Transition Index, Global Competitiveness Report, Global IT Report - WEF along with INSEAD, and Cornell University publishes this report, Global Gender Gap Report, Global Travel and Tourism Report.

EUROPE'S COPERNICUS PROGRAMME

(Syllabus GS Paper 3 – Science and Tech)



EU's Copernicus emergency service, called in to locate Raisi's chopper

ALIND CHAUHAN
NEW DELHI, MAY 21

SOON AFTER Iranian President Ebrahim Raisi's helicopter crashed on Sunday, the European Union (EU) activated its rapid satellite mapping service to help search efforts, following a request for assistance from Iran.

Janez Lenarcic, European Commissioner for Crisis Management, posted on X: "Upon Iranian request for assistance we are activating the EU's @CopernicusEMS rapid response mapping service in view of the helicopter accident reportedly carrying the President of Iran and its foreign minister."

The wreckage of the helicopter was found on Monday after an overnight search in blizzard-like conditions.

The rapid mapping service is one of the crucial components of the Emergency Management Service (EMS), which comes under the EU's Copernicus programme. What is the Copernicus EMS, and how does its rapid mapping service work?

What is the Europe Union's Copernicus programme, to begin with?

The Copernicus programme is part of the EU's space programme and aims to monitor the Earth and its environment by collecting data from a set of satellites known as the Sentinels. It also gets data from contributing missions (existing commercial and public satellites) and *in situ* or non-space sources such as ground stations.

The data are processed and analysed to generate value-added information, which can

At the site of the crash . Reuters

be used for a wide range of applications in many areas. These include land management, the marine environment, the atmosphere, emergency response, security, and climate change, according to the website of the European Space Agency (ESA). Users get the information on a "full, open, and free-of-charge" basis, the website says.

Launched in 1998, the Copernicus programme was earlier called Global Monitoring for Environmental Security (GMES). Currently, it is implemented by the European Commission (EC) with support from the ESA and the European Environment Agency (EEA).

And what is Copernicus EMS?

The Copernicus EMS has been in operation since 2012, and provides geo-spatial information derived from satellite remote sensing and in situ data sources to help manage natural disasters, man-made emergencies, and humanitarian crises.

There are two components of the service: the mapping component and the early warning component. The former provides maps and analysis based on satellite imagery; the latter issues alerts about floods, droughts, and forest fires, and gives near-real time assessment of forest fire impacts.

The mapping component has two modules: rapid mapping (RM); risk and recovering mapping (RRM). The RM, which was activated to look for Raisi's crashed helicopter, provides maps within days or hours, anywhere in the world. The RRM delivers maps that are required for disaster management – and not for immediate responses – within weeks or months. It is used for prevention, preparedness, disaster risk reduction, and recovery.

How does the rapid mapping work?

To provide maps quickly, the service acquires, processes, and analyses satellite imagery, geospatial data, and social media when required. According to the Copernicus website, the RM service can supply four different "products" – each one of them provides maps and brief analysis – which the user can choose while requesting the service.

- **Reference Product:** It gives quick information on the area of interest and assets before the emergency/disaster takes place.
- **First Estimate Product:** It provides a quick assessment of the most affected locations after the disaster has taken place.
- **Delineation Product:** It supplies information on the impact, extent, and update on the situation after the disaster has taken place.
- **Grading Product:** It provides damage assessment, spatial distribution, and extent after the disaster has taken place.

Context: The European Union recently activated its "rapid response mapping service" to assist Iran in searching for a helicopter carrying the President of Iran.

Europe's Copernicus Programme

- **About**: It is part of the EU's space programme and aims to monitor the Earth and its environment by collecting data from a set of satellites known as the Sentinels.
  - It also gets data from contributing missions (existing commercial and public satellites) and in situ or non-space sources such as ground stations.
- **Historical Background**
  - Named after the 15th-century scientist Nicolaus Copernicus, the programme was launched in 1998.
  - Initially, it was known as the Global Monitoring for Environment and Security Programme (GMES).
- **Implemented by**: EU member states with the support of the European Space Agency (ESA) for the space component and the European Environment Agency (EEA) for the in-situ component.
- **Rapid Mapping Service**: It is one of the crucial components of the Emergency Management Service (EMS), which comes under the EU's Copernicus programme.

Copernicus EMS

- **About:** It has been operational since 2012. It provides geospatial information derived from satellite remote sensing and in situ data sources.
- **Purpose**: The Copernicus EMS helps manage natural disasters, man-made emergencies, and humanitarian crises.
- **Two Main Components**
  - **Mapping Component**: Provides maps and analysis based on satellite imagery.
  - **Early Warning Component**: Issues alerts about floods, droughts, and forest fires, and provides near-real-time assessments of forest fire impacts.
- **Mapping Component**
  - **Rapid Mapping (RM)**: Delivers maps within days or hours, anywhere in the world. Used for immediate disaster response, such as locating Raisi's crashed helicopter.
  - **Risk and Recovery Mapping (RRM)**: Provides maps for disaster management within weeks or months. Focuses on prevention, preparedness, disaster risk reduction, and recovery.

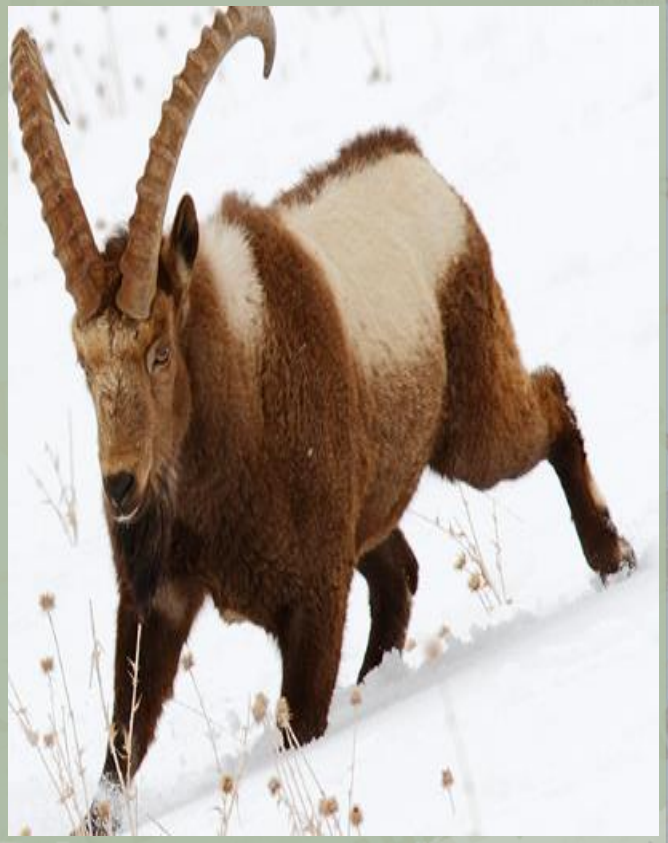
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HIMALAYAN IBEX

(Syllabus: GS Paper 3 – Env and Eco)

Census exercise begins in Himachal's cold desert Lahaul & Spiti district to estimate blue sheep, Himalayan ibex

Context: Recently, wildlife authorities in Himachal Pradesh's Lahaul & Spiti district commenced surveys to conduct a census, estimating the populations of blue sheep or bharal and Himalayan ibex, primary prey for the iconic snow leopard.



Himalayan Ibex

- **About:** It is a subspecies of the Siberian Ibex.
- **Scientific name**: Capra sibirica hemalayanus
- **Habitat**: Cold deserts, rocky outcrops, steep terrain, high-land flats, mountain ridges, and low mountains and foothills.
- **Global Distribution**: This species can be found in several countries, including India, Kazakhstan, Tajikistan, Mongolia, Pakistan, Southern Siberia, and China.
- **Behaviour**: In winter, they come down to lower elevations in search of food as the mountains get covered in snow.
- **Geographic Range**: The Ibex is distributed across montane environments in Asia, inhabiting elevations ranging from 500 m to 6,700 m.
- **IUCN Status**: Least concern.
- **Hemis National Park:** Home of Himalayan ibex.

INDIAN EXPRESS

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FLIGHT TURBULENCE

(Syllabus: GS Paper 3 – S&T)



TURBULENCE

A disruption of airflow over the wings of an airplane, which causes it to enter irregular vertical motion

ONE PERSON died and some injuries were reported after a Singapore Airlines flight (SQ321) from London to Singapore encountered "severe turbulence" on Monday. The flight was diverted and landed in Bangkok. *Reuters* cited Thai media reports as saying there were around 30 injuries. The cause of death and nature of injuries were not known immediately.

What happens during turbulence?

Turbulence means disruption of airflow over the wings of an airplane, which causes it to enter irregular vertical motion.

There are at least seven kinds of turbulence that an aircraft can run into. 'Wind shear' happens when there is a sudden change in wind direction, typically occurring close to thunderstorms, jet streams, etc. In 'Mountain Waves', one of the most severe types of turbulence, oscillations form on the downwind side of mountains when strong winds flow towards mountains in a perpendicular fashion. Aircraft tracking perpendicularly across, or downwind of a mountain, may experience sudden loss of altitude followed by a sudden reduction in airspeed.

Are turbulence incidents dangerous?

It depends on their nature and intensity. Aircraft undergo some form of turbulence on a regular basis and pilots are trained to deal with these. However, there have been several instances when turbulence has brought down modern jetliners.

Even in these cases, while intense turbulence has been the main cause of an accident, several other factors — such as lack of proper training, poor dissemination of weather or wind related information — have contributed to the accident.

In 2022, a SpiceJet Boeing 737-800 with 189 passengers encountered "severe turbulence" after flying into bad weather while descending. The airspeed suddenly dropped by around 100 knots, before rising again. This caused passengers and crew to rise up almost as if in a zero-gravity situation and to be then slammed back down in a matter of minutes.

Two people were admitted to intensive care units and were treated for head and spine injuries.

Inside SQ321 on Tuesday. *Reuters*

What should passengers do?

According to the US Federal Aviation Administration (FAA), "passengers can easily prevent injuries from unexpected turbulence by keeping their seat belt buckled at all times".

It suggests passengers should listen to instructions from flight attendants; pay attention to the safety briefing at the beginning of the flight; wear a seat belt at all times; use an approved child safety seat or device if a child is under two; and adhere to carry-on restrictions.

How can airlines avoid turbulence?

The FAA recommends that carriers improve dispatch procedures by keeping communication channels open always; include turbulence in weather briefings; promote real-time information sharing between pilot and dispatcher; reinforce the carrier's turbulence avoidance policy through dispatcher training; consider rerouting using atmospheric modelling and data displays; and use all applicable weather data among other steps. **ENS**

Context: A Singapore Airlines flight (SQ321) from London to Singapore recently encountered severe turbulence, resulting in one death and several injuries.

Turbulence

- **About:** It means a pockets of disturbed air can have many causes, most obviously the unstable weather patterns that trigger storms
- **Flight turbulence**: It means disruption of airflow over the wings of an airplane, which causes it to enter irregular vertical motion.
- **Types of flight turbulence**: There are at least seven kinds of turbulence that an aircraft can run into:
  - **WIND SHEAR:** Happens when there is a sudden change in wind direction, whether vertically or horizontally. Typically occurs close to thunderstorms, jet streams, etc.; tricky for pilots as tailwinds suddenly change to headwinds or vice versa.
  - **FRONTAL:** Created in the frontal zone when warm air is lifted by sloping frontal surface and friction between opposing air masses. Most palpable when warm air is moist; intensity increases with thunderstorms. Most common close to thunderstorms.
  - **CONVECTIVE:** When land surface temperature rises, the air above the ground heats up and rises, creating air pockets around it. Convection currents cause difficulties during approach as they tend to affect the rate of descent.
  - **WAKE:** Forms behind an aircraft when it flies through air-creating wingtip vortices. Can be dangerous for small aircraft following bigger ones, which tend to disrupt the airflow more strongly in their wake.
  - **MECHANICAL**: This type of turbulence occurs when tall solid objects such as mountains or highrise constructions disrupt the normal airflow, causing the air for planes to fly through to become dirty.
  - **CLEAR AIR:** Occurs when an aircraft crosses from one air mass to another, which has a different direction. Clear air turbulence could also happen when an aircraft moves out of a jet stream. Clear air turbulence is mainly caused by wind or jet streams.
  - **MOUNTAIN WAVE:** One of the most severe; these are oscillations that form on the downwind side of mountains when strong winds flow towards mountains in a perpendicular fashion. Aircraft tracking perpendicularly across, or downwind of a mountain, may experience sudden loss of altitude followed by a sudden reduction in airspeed.

HINDUSTAN TIMES Page 8

MATUA COMMUNITY

(Syllabus: GS Paper 1 – Art & Culture)

Citizenship for Matuas takes centre stage in state

Tanmay Chatterjee
letters@hindustantimes.com

KOLKATA: The granting of citizenship certificates to 300 people by the Centre has put the spotlight on a tussle between the Trinamool Congress (TMC) and the Bharatiya Janata Party (BJP) over the Citizenship Amendment Act (CAA), which is likely to influence voting in the remaining 17 seats in West Bengal that go to the polls in the sixth and seventh phases.

At least 11 of these 17 seats spread across eight districts, including Kolkata, are home to a sizeable number of Namasudra and Matua community voters, many of whom, or their ancestors, came as refugees from East Pakistan during Partition and from Bangladesh after the 1971 Liberation War. These communities are clubbed under the Scheduled Caste (SC) category. Hindus account for 70.54% of West Bengal's population of 91.3 million, according to the 2011 Census. The state's SC population stood at 21.4 million, or 23.51% of the total population, in 2011.



West Bengal chief minister Mamata Banerjee with members of the Matua community in Bangaon on May 14. PTI

POLL WATCH

In Purulia, Prime Minister Narendra Modi invoked this issue this week. "I promised I would grant citizenship to the refugee families. This nation had been expecting this from us since Independence. These people are from SC communities. TMC is opposing CAA. Let TMC, Congress and Left note this down today. You won't be able to do anything as long as Modi is alive."

Chief minister Mamata Banerjee said some of those who received the certificates are Afghan nationals, who have nothing to do with West Bengal. "You must have seen an advertisement in some newspapers today. You see the photos of some people thanking Narendra Modi and the Union home minister (Amit Shah) for enforcing CAA. This is all a lie. It is fake."

CAA fast-tracks citizenship to Hindu, Jain, Buddhist, Christian, Parsi and Sikh refugees who entered India from Afghanistan, Pakistan and Bangladesh before December 31, 2014, to escape religious persecution. Before the 2019 Lok Sabha polls, in which the BJP won 18 of West Bengal's 42 seats, it promised to enforce CAA to secure the confidence of the Matuas, a religious sect formed by social reformer Sri Harichand Thakur (1812-78).

When CAA was enforced on March 11, the TMC saw it as a strategic move by the BJP. However, the Matuas have been anxious as the CAA portal seeks signed affidavits from applicants along with documents such as passport, land record or birth certificate issued by the Bangladesh government. "Most of the Matuas from Bangladesh destroyed their passports and other documents after procuring Aadhaar and ration cards," said Mahitosh Baidya, the Mahasangha general secretary.

While addressing at least two rallies every day, Banerjee is projecting CAA as a threat to both Hindus and Muslims, saying it is a precursor to enforcement of the National Register of Citizens that left 1.9 million Hindus in jeopardy in BJP-ruled Assam in 2018, and the Uniform Civil Code, on which Uttarakhand passed a law in February.

"The rules have exposed the BJP. My father-in-law Pramatha Ranjan Thakur's main demand from the Centre post 1947 was that Dalit and Namasudra refugees should get Indian citizenship without having to produce documents," Mamata Bala Thakur said. Pramatha Ranjan Thakur was a legislative assembly member from the Bengal province in 1946.

Matua Mahasangha

- **About**: Matua Mahasangha emerged around 1860 AD in present-day Bangladesh and gained supporters in both Bangladesh and West Bengal, India.
- **Founder:** The movement was initiated by the followers of Harichand Thakur, who received spiritual enlightenment at a young age and preached his philosophy through Twelve Commandments.
- **Emphasis on Education**: Thakur's teachings prioritize education as a vital means for societal upliftment, reflecting a belief in knowledge as a tool for progress.

Context: The Citizenship Amendment Act (CAA) sparked discussions in five Lok Sabha constituencies in West Bengal, particularly among the Matuas, a Hindu sect seeking citizenship under the act.

Matua Community

- **About:** It is a sect of depressed class Hindus, primarily comprising Namasudras, a Scheduled Caste group.
- **Origin:** from East Pakistan, Matuas migrated to India during Partition and subsequent events such as the creation of Bangladesh.
  - Despite their long presence in India, a significant portion of the Matua population still lacks Indian citizenship.
- **Founder:** The Matua sect, rooted in Vaishnava Hinduism, was founded by Harichand Thakur in undivided Bengal.
- **Beliefs:** The teachings of Harichand Thakur attracted members of marginalized communities, including Chandals and Namasudras, historically considered untouchables.
- **Geographical Settlement**: Following the partition of East Pakistan, a considerable number of Matua followers resettled in West Bengal, shaping the demographic landscape of the region.
  - West Bengal became a significant hub for the Matua community, fostering their cultural, social, and religious practices.

TIMES OF INDIA

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Schengen visa fee hike by 12% to make Europe vacay costlier

New Delhi: The European Commission has announced a global increase in short-stay Schengen visa fees, effective from June 11. This decision will see the cost of Schengen visas (visa type C) rise by 12%, impacting travellers planning to visit Europe.

Under the new fee structure, the cost for adult applicants will be €90, up from the current €80. For children aged 6 to below 12 years, the fee will increase from €40 to €45. This hike applies to visa applications submitted worldwide.

Schengen visa permits travel across 27 European countries, including popular tourist destinations such as France, Germany, Italy, and Spain. The fee adjustment aims to align with the increasing costs of processing visas and maintaining the security of the Schengen area. The last fee update was implemented in Feb 2020, when the adult visa fee was increased to €80 from €60.

The European Commission justified the latest hike by citing inflation and the need to cover administrative costs associated with the visa process, which includes background checks, data processing, and maintaining secure entry systems. Applicants from Armenia, Azerbaijan, and Belarus will pay €35, and applicants from Cabo Verde will pay €60. ANI

SCHENGEN AREA

(Syllabus: GS Paper 2 – IR)

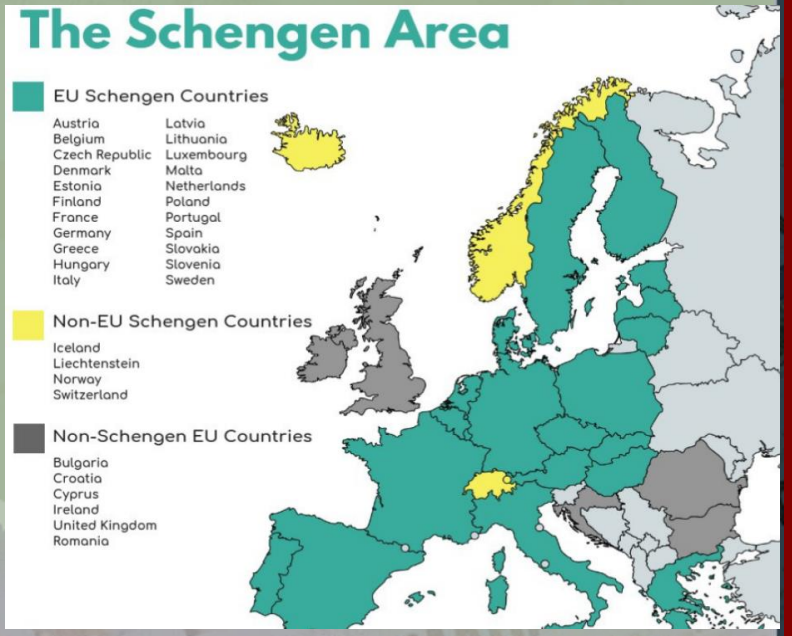
Context: Recently, the European Commission unveiled a global rise in short-stay Schengen visa fees, resulting in a 12% increase in the cost of Schengen visas (type C), affecting travelers intending to visit Europe.

Schengen Area

- **About:** An area without internal border controls.
- **Membership:** The Schengen Area comprises 29 European countries.
  - **25 EU states:** Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Germany, Estonia, Greece, Spain, France, Italy, Latvia, Lithuania, Luxembourg, Hungary, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, and Sweden.
  - **Non-EU members**: Iceland, Liechtenstein, Norway, and Switzerland.
  - **Recent entry**: **Bulgaria and Romania** become Schengen members.
- **Origin:** Named after the 1985 Schengen Agreement and the 1990 Schengen Convention, both signed in Schengen, Luxembourg. Operates as a single **jurisdiction under a common visa policy for international travel purposes,** facilitating ease of movement for citizens and visitors.

Schengen visa regulation:

- **About:** Schengen visas allow the holder to travel freely in the Schengen area for short stays of a maximum of 90 days in any 180-day period.
  - The visas are **not purpose-bound**, but they **do not grant the right to work.**
- **Comparison with US Visas:** While US offers 10-year visas to Indians for visit and tourism (B1/B2 category), Schengen countries typically issue travel date-specific visas.
- **New regulations:** Indian nationals can now be issued long-term, multi-entry Schengen visas valid for two years after having obtained and used two visas in the past three years. The two-year visa will normally be followed by a five-year visa, if the passport has sufficient validity remaining.

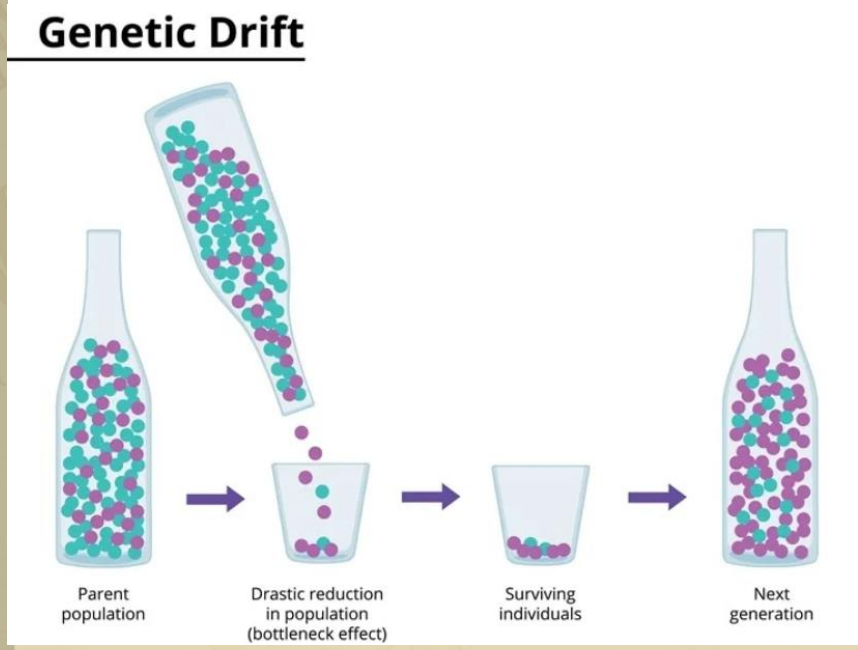


PHY.ORG May 21

GENETIC DRIFT

(Syllabus: GS Paper 3– Sci and Tech)

Genetic drift, not natural selection, identified as main factor driving speciation in endangered pupfish species



Gene Flow

- **About:** Gene flow entails the transfer of genes among populations, species, or organisms, exemplified by bacterial gene transfer. Conversely, genetic drift involves the random selection of genes within a population.
- **Migration**: Gene flow arises when individuals migrate from one population to another and interbreed.

Context: Genetic drift, not natural selection, was recently identified as the main factor driving speciation in endangered pupfish species.

Genetic Drift

- **Definition**: It is an evolutionary change in allelic frequencies of a population as a matter of chance.
  - Genetic drift describes random fluctuations in the numbers of gene variants in a population.
  - It takes place when the occurrence of variant forms of a gene, called alleles, increases and decreases by chance over time.
  - These variations in the presence of alleles are measured as changes in allele frequencies.
- **Population Size:** It occurs in very small populations, but its effects are strong.
- **Cause:** Occurs due to an error in selecting the alleles for the next generation from the gene pool of the current generation.
- **Environmental Independence**: It does not occur due to any environmental influences.
- **Stability in Large Populations:** In large populations, the allele frequency of the genes remains relatively stable because the genes are not affecting fitness and do not have a natural selection pressure against the alleles.
- **Types of Genetic Drift**
  - **Bottleneck Effect:** Population size severely decreases due to competition, predators, or diseases.
  - **Founder Effect**: A new population is founded in a new location due to physical or geographical barriers. The new population formed does not interact and mate with the original population.

FINANCIAL EXPRESS

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CRYPTOCURRENCY

(Syllabus: GS Paper 3 – Economy)

RBI warns against cryptocurrencies

FE BUREAU
Mumbai, May 21

THE RESERVE BANK of India (RBI), in its monthly bulletin on Tuesday, reiterated its stand on cryptocurrencies, saying they are driven by speculators and that retail investors need to be more careful.

Calling them decentralised finance or DeFi, the central bank said, "Our findings suggest that the interests in cryptocurrencies are driven by speculative motives rather than a means of payment for real economic transactions. As the crypto ecosystem lacks accountability and stability and is marked by regulatory ambiguity, retail investors need to be more cautious."



It said the borderless crypto ecosystem has the potential to spread to any country with minimum IT infrastructure requirement. "The volatility in terms of coefficient of variation in DeFi return is higher... which suggests the motive of investing in DeFi as a speculative investment (a "gamble") rather than a means of payment for real economic transactions," it added.

Cryptocurrency is a digital asset designed to be used on the internet. The name originates from the fact that its transactions are highly encrypted, making the exchanges secure.

It is decentralised, unlike traditional currencies, which are managed and controlled by a central authority. A cryptocurrency is finite in number and at times equated to precious metals like gold and silver.

RBI has long been sceptical of cryptocurrencies. In April 2018, it had ordered financial institutions to break off ties with individuals or businesses dealing in virtual currency such as Bitcoin within three months. However in 2020, the Supreme Court overturned the decision, allowing banks to handle cryptocurrency transactions from exchanges and traders.

Context: The Reserve Bank of India (RBI) recently cautioned that cryptocurrencies, propelled by speculative interests, pose risks to the financial system, urging retail investors to exercise caution.

Cryptocurrency

- **About**: Cryptocurrency refers to a digital or virtual currency that employs cryptography for security measures.
- **Decentralization**: One of the defining features of cryptocurrencies is their decentralized nature, which means they are not under the control of any government or institution.
- **Examples**: Prominent examples of cryptocurrencies include Bitcoin, Ethereum, and Litecoin.
- **How Does Cryptocurrency Work**: It operates through a decentralized digital ledger called the blockchain, where transactions are publicly recorded and verified by a network of computers worldwide.
- **Three key-elements of crypto-currency**:
  - It is a digital representation of value,
  - It can be transferred electronically and
  - It is recorded in a digital ledger (Blockchain Technology) that is widely accessible.
- **Types of Cryptocurrencies:** Payment cryptocurrency, Utility Tokens, Stablecoins and Central Bank Digital Currencies (CBDC).

Significance of Cryptocurrencies

- **Corruption Monitoring:** Operating on a peer-to-peer network, blockchain technology aids in monitoring corruption by tracing fund flows and transactions.
- **Efficiency in Time:** Cryptocurrencies can significantly reduce costs and time for both senders and recipients, as transactions occur online with minimal fees and near-instantaneous processing.

SCIENCE REPORTER

May 21

ARTIFICIAL WOMB

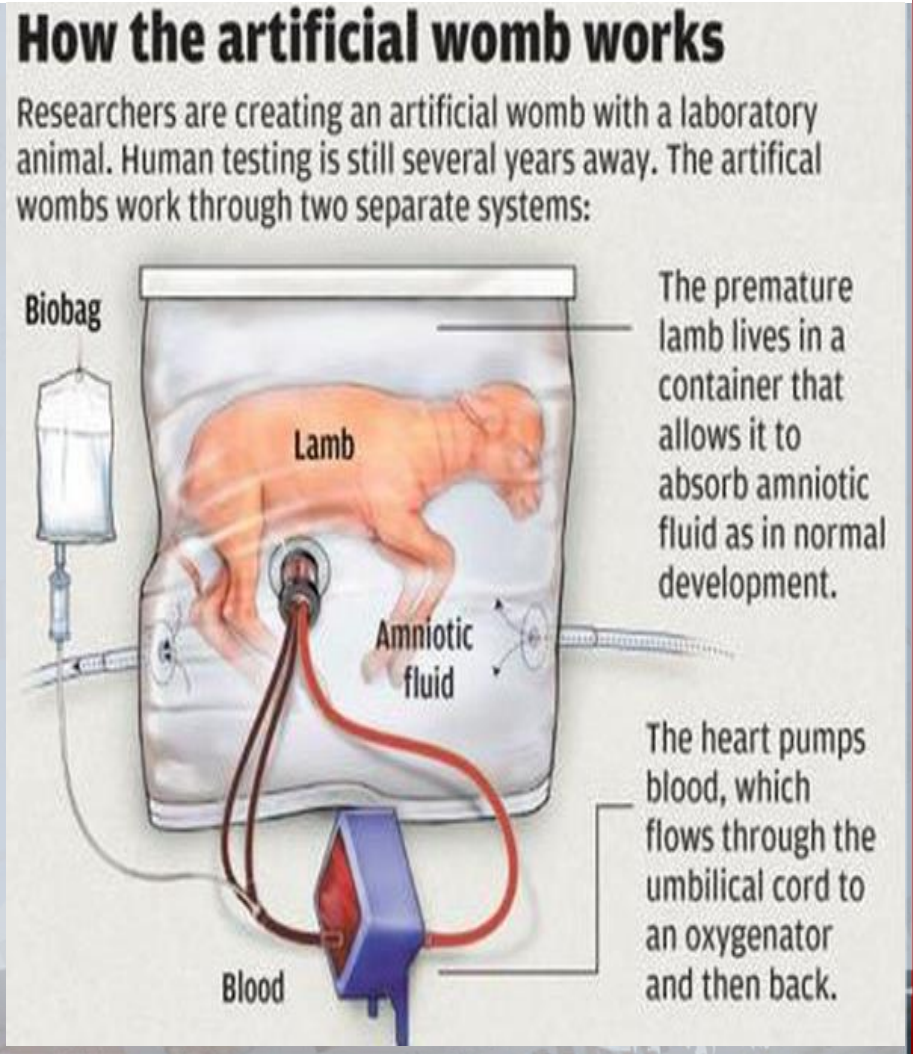
(Syllabus: GS Paper 3 – Sci and Tech)

Artificial Womb A revolutionary reproductive technology for next-gen humans

Context: Artificial wombs, a groundbreaking innovation, offer promising prospects for infertile women, potentially revolutionizing reproductive technology.

Artificial Womb

- **About**: It is a device designed to simulate the environment of the uterus and support the growth and development of embryos or fetuses outside the body of a biological mother.
- **known as**: Ectogenesis chamber or artificial uterus.
- **Structure and Function**: Typically, these devices involve a clear "biobag" filled with fluid where the infant is suspended, mimicking the conditions of a uterus.
- **Extended Development Period**: The purpose of an artificial womb is to extend the gestational period for premature babies, allowing them to further develop outside the mother's body.
- **Reduced Complications**: By spending additional time in an artificial womb, premature infants can potentially reduce the risk of complications associated with premature birth.
    - In these devices, babies do not breathe air but have their lungs filled with lab-made amniotic fluid, replicating the conditions of the womb.
- **Focus:** A significant focus of artificial womb technology is to support and enhance lung development, which is often a critical factor in the survival of premature infants.
- **Treatment**: The ultimate goal is for infants to transition from the artificial womb to conventional care with improved chances of survival and fewer complications.



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VIABILITY GAP FUNDING (VGF)

(Syllabus: GS Paper 3 – Economy)

Govt invites proposals for coal gasification under VGF scheme

Rituraj Baruah
rituraj.baruah@livemint.com
NEW DELHI



The proposals need to be submitted by 12 September. COAL.GOV.IN

The coal ministry on Tuesday sought proposals from public and private sector players among others for coal gasification projects under a ₹8,500-crore viability gap funding (VGF) scheme. The proposals have to be submitted by 12 September.

"To promote clean coal technologies, the ministry of coal has issued RFP (request for proposal) seeking proposals from public sector undertakings, private sector investors, R&D agencies, etc. under scheme for promotion of lignite and coal gasification," said an official statement.

Coal and lignite production in FY24 stood at 1 billion tonnes and the target for this fiscal has been set at 1.08 billion tonnes. Noting that in future there would be surplus domestic coal after meeting the requirement of power and other sectors, the ministry said that coal-to-chemical and gasification processes are being promoted.

In January, the Union cabinet approved a ₹8,500 crore VGF scheme for coal gasification.

According to current plans, for public sector units, a viability gap funding of ₹1,350 crore per project would be provided. Under category II, mainly private sector investors, a viability gap support of ₹1,000 crore would be provided. Under category III or demonstration projects, the support is for ₹100 crore per project.

Apart from VGF, the ministry has created a separate long-term linkage window. It has also notified a policy under which commercial or captive coal mine owners may utilize their coal for gasification, for which a 50% incentive on revenue-share would be provided.

Gasification is the process by which coal is turned into fuel gas and is considered as a cleaner option than burning coal. This gas can be used to produce gaseous fuels such as hydrogen, methane, methanol and ethanol. However, the high ash content in Indian coal is a technical barrier to a wider adoption of coal gasification.

India has the fourth largest coal reserves in the world, with reserves of 361.41 billion tonnes, according to data from the coal ministry.

Context: Recently, the coal ministry invited proposals from public and private sector entities, among others, for coal gasification projects, as part of an ₹8,500-crore viability gap funding initiative.

Viability Gap Funding (VGF)

- **About**: VGF stands for Viability Gap Funding, which aims at supporting infrastructure projects that are economically justified but fall marginally short of financial viability.
- **Initiated:** In 2004, supports projects falling under Public-Private Partnerships (PPP).
    - This scheme operates as a Plan Scheme, with budget allocations made on an annual basis by the Ministry of Finance.
- **Aim:** VGF grants are given as capital subsidies to encourage private sector involvement in financially unviable PPP projects.
- These projects often lack commercial viability due to extended gestation periods and limited future revenue prospects.

Components of Viability Gap Funding Scheme

- **Sub-scheme 1**: This includes Water Supply, Solid Waste Management, Waste Water Treatment, Health and Education etc.
    - The amount of VGF under this scheme shall be equivalent to the lowest bid for capital grant, subject to maximum of 30% (Thirty percent) of the Total Project Cost.
- **Subscheme 2:** This scheme supports demonstration or pilot social sector projects in areas such as health and education. It expects a minimum of 50% operational cost recovery.
    - Under this scheme, the Central Government and State Governments jointly fund up to 80% of capital expenditure and up to 50% of operation and maintenance costs for the first five years.
    - The Central Government contributes a maximum of 40% of the total project cost (TPC) and may additionally cover up to 25% of operational costs during the project's initial five years of commercial operations.

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