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DAILY CURRENT AFFAIRS (DCA)

Time: 45 Min

Date: 22-08-2024

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TENSIONS IN SOUTH CHINA SEA POSES THREAT TO INTERNATIONAL TRADE

Context

- The rising tensions in the South China Sea are posing a threat to international trade.

South China Sea

- It is a marginal sea of the **Western Pacific Ocean.**
- It is located between **southern China, Taiwan, the Philippines, Indonesia, Vietnam, Thailand, Cambodia and Malaysia.**
- It is a crucial maritime gateway and junction for shipping between the **Pacific and Indian Oceans.**

Choke Point in the South China Sea

- While the current tensions are between **China, the Philippines and Taiwan**, the real threat to trade in the Sea comes in the **Malacca Strait.**
  - The strait is the **Choke point** in the South China Sea, which lies between **Malaysia, Indonesia and Singapore.**

Nine Dash Line

- **China stakes claim to 90%** of the South China Sea (SCS), and this claim is based on the **U-shaped nine-dash line** etched on map in the **1940s** by a Chinese geographer.
  - He helped to officially name each chunk of rock and reef, referring to the territory collectively as the South China Sea Islands.
- These lines cut into the **exclusive economic zones (EEZs), of Brunei, Indonesia, Malaysia, the Philippines, Taiwan and Vietnam.**
- In recent years, China has **doubled down on its territorial claims** in the SCS, including in the waters off the Philippines, where Chinese vessels have engaged in brazen acts of provocation.

Importance of the South China Sea for international trade

- According to the **United Nations Conference on Trade and Development (UNCTAD),** about a third of global maritime trade passes through the **3.5 million square kilometer seaway** annually,
- Around **40% of petroleum products** traded globally are delivered via the sea every year.
- In 2016, an estimated **$3.6 trillion worth of goods and commodities** traveled the seaway.
- Tens of thousands of cargo vessels move through the South China Sea every year, carrying around **40% of China's, a third of India's and 20% of Japan's trade** with the rest of the world.
  - Out of all of Asia, the three countries' economic security is most closely tied to the smooth running of the waterway.

Why is the South China Sea contested?

- According to the US Energy Information Administration, the South China Sea is estimated to hold about **5.38 trillion cubic meters** of **natural gas** and **11 billion barrels of oil reserves**,
- The disputed waters also contain **large deposits of rare-earth minerals** crucial to China's technological ambitions, including electric vehicle batteries and advanced electronics.
- China could also **deny foreign military forces,** particularly the United States', access to the maritime region.
- Control of the sea lane would allow China to potentially disrupt, or threaten to **disrupt cargo shipments** traveling to and from all countries in East and Southeast Asia.

Way Ahead

- The South China Sea is a vital crossroads for both intra-Asian trade as well as for commerce with the rest of the world, especially Europe, the Middle East and Africa.
- Hence to de-escalate the current tensions in the South China Sea different parties should avoid hostile actions against each other, uphold a more reconciliatory attitude and emphasize the need to cooperate rather than compete.

Source: IE

PRIME MINISTER'S STATE VISIT TO POLAND

Context

- Prime Minister Narendra Modi paid a State visit to Poland, it is the **first Indian prime minister visit to Poland in 45 years.**

About

- The visit coincides with the **70th anniversary of diplomatic relations** between Poland and India, marking a milestone in the long-standing relationship.
- The talks between the two nations are set to cover a wide array of sectors including **agriculture, information technology, security, and eco-friendly technologies,** with a particular focus on **India's advancements in the space industry.**
- The visit signifies a **deepening of political and economic ties** and holds international significance.

Overview of India-Poland Relations

- **Diplomatic relations** were established in **1954**, the two countries shared **common ideological perceptions**, based on their opposition to colonialism, imperialism and racism.
- **Historical Relations:** The two countries share several chapters of history.
  - During World War II, the Maharaja of Jamnagar provided refuge to several hundred Polish women and children trying to reach the West. A street and a junior high school in Warsaw have been named in his honour.
  - In 1944, Poles and Indians joined forces to retake the hill and monastery of Monte Cassino, pushing out German forces and opening the Allies' path to Rome.
- **Economic & commercial Relations:** Poland continues to be **India's largest trading & investment partner in Central & Eastern Europe.**
  - Over the period 2013-2023, the total bilateral trade with Poland has witnessed an increase of **192% i.e. from US$1.95 billion in 2013 to US$5.72 billion in 2023.** The balance of trade continues to be largely in favour of India in 2023.
- **Tourism and business** are growing in both directions, with Indian companies investing in Poland, particularly in the IT, biotechnology, electronics, and packaging sectors.
  - In 2023, these companies employed about 10,000 Polish workers and invested over US$ 3 billion.
- **Significance of Relations:** India is now the fifth and soon-to-be third-largest economy in the world, while Poland ranks sixth in the EU and 21st globally.
  - India is becoming a key player in the Indo-Pacific region, where a systemic rivalry exists between two superpowers: China and the United States (US).
  - Poland is positioned as the West's hub for operations in Ukraine, is the leading country on NATO's eastern flank, and plays a pivotal role in constructing a new architecture for European security against Russia.
- Recognising these shifts, **both the countries are striving harder than ever to forge better political and economic ties.**

Way Ahead

- The key areas of bilateral Poland-India cooperation focus areas can be **research and development, particularly in electromobility**.
- Direct air connections between New Delhi, Mumbai, and Warsaw facilitate business, scientific, and tourism ties **that began in 2019.**
  - Poland's aspirations to create a new aviation hub in the heart of Europe could align well with **India's expanding aviation infrastructure,** where passenger traffic is growing by 15 percent annually.
- With the largest ship design office in Europe and shipyards capable of constructing modern cargo and passenger vessels powered by electric and LNG propulsion, **Poland could be a key partner.**
- Poland needs to **adopt a new perspective on India** as a flourishing global player, recognised by major world powers like the US and China.

Source: TOI

REACTOR BLAST AT ANDHRA PRADESH PHARMA PLANT

Context

- Recently, a major fire broke out after a reactor blast in ***Escientia Advanced Sciences Private Ltd. in the Special Economic Zone*** at **Atchutapuram in Anakapalli of Andhra Pradesh** leading to at least 17 workers being killed and 20 others sustained burns.
  - The blast reportedly occurred after a reactor malfunctioned. The company manufactures intermediate chemicals and pharmaceutical ingredients.

Factory Accidents in India

- Industrial accidents pose significant risks to workers, communities, and the environment. In India, these incidents have been a cause for concern, affecting lives, livelihoods, and economic productivity.

- According to data by the **National Disaster Management Authority (NDMA)**, 130 significant chemical accidents have been reported, which resulted in 259 deaths and left 563 people with major injuries in the past ten years.

Common Causes of Factory/Industrial Accidents

- **Lack of Safety Measures:** Some factories operate without proper safety protocols, including inadequate training, insufficient protective gear, and poorly maintained machinery.
  - Fatal industrial accidents have been alarmingly frequent, with incidents reported in 2016, 2018, 2020, and 2023.
  - Shockingly, the boiler in the chemical factory involved in the recent explosion was not even registered under the **Indian Boiler Regulations, 1950.**
  - **Human error** like negligence and fatigue often lead to accidents.
- **Unsafe Work Environments:** Congested spaces, cluttered floors, and inadequate ventilation increase the risk of accidents. Additionally, factories dealing with hazardous materials (such as chemicals, gases, or heavy machinery) face heightened dangers.
- **Machinery Malfunctions:** Faulty equipment, lack of maintenance, and outdated machinery can lead to accidents. Workers operating heavy machinery are particularly vulnerable.
- **Electrical Hazards:** Electrical fires, shocks, and short circuits pose a significant risk in factories. Poorly insulated wiring and overloaded circuits contribute to accidents.
- **Chemical Exposure:** Factories dealing with chemicals (e.g., in the pharmaceutical, textile, or chemical industries) must handle them carefully. Accidental spills, leaks, or inhalation can have severe consequences.
- **Low Inspection Rates:** The inspection rates for hazardous factories are alarmingly low. For instance:
  - In Maharashtra, only 23.89% of hazardous factories were inspected in 2021.
  - Tamil Nadu had a general inspection rate of 17.04% and a hazardous factories inspection rate of 25.39%.
  - Gujarat's inspection rates were 19.33% (general) and 19.81% (hazardous).
  - Nationally, the figures were 14.65% (general) and 26.02% (hazardous).
- **Poor Prosecution Rates:** The prosecution rates (decided cases as a percentage of total prosecutions) are also disheartening and far from satisfactory.
  - Gujarat: 6.95%
  - Maharashtra: 13.84%
  - Tamil Nadu: 14.45%

Impact on Workers

- **Injuries:** Workers suffer cuts, burns, fractures, and other physical injuries due to machinery mishaps, falls, or chemical exposure.
- **Amputations:** As highlighted in a recent report, auto-sector workers often lose fingers due to crush injuries.
- **Fatalities:** Tragically, some accidents lead to loss of life.
- **Long-Term Health Issues:** Exposure to hazardous substances can cause chronic health problems, including respiratory issues, skin disorders, and cancers.

Steps Forward

- **Awareness:** Workers and employers must be educated about safety practices.
- **Regular Inspections:** Authorities should conduct routine inspections to identify safety gaps.

- **Investment in Safety:** Employers should prioritise safety measures, including proper training, safety gear, and well-maintained machinery.
- **Legal Accountability:** Strict enforcement of safety regulations is crucial.

Legal Framework

- India has laws and regulations aimed at ensuring workplace safety. The **Occupational Safety, Health, and Working Conditions Code, 2020**, consolidates provisions related to occupational safety and health.
  - However, effective implementation and enforcement remain challenges,
- **Government's Initiatives like** National Policy on Safety, Health and Environment at Workplace (NPSHEW), Industrial Safety and Disaster Management Plans, National Disaster Management Authority (NDMA), Bureau of Indian Standards (BIS), and Labour Inspection and Enforcement are crucial.

Related Global Efforts

- **Global Strategy on Occupational Safety and Health (2024-2030):** The **International Labour Organization (ILO)** has introduced a new plan to prioritise workers' well-being.
  - It aims to enhance safety and health in workplaces worldwide, aligning with the ILO's commitment to social justice and decent work.

International Tools and Support

- **Organisation for Economic Co-operation and Development (OECD):** Provides policy guidance for the prevention, preparedness, and response to chemical accidents.
- **EU Policy:** Focuses on major-accident hazards.
- **UN Environment:** Supports prevention and preparedness at local and national levels.
- **WHO:** Manages public health during chemical incidents.
- **United Nations Office for Disaster Risk Reduction (UNISDR):** Advocates for a new framework for disaster risk reduction.
- **Organisation for the Prohibition of Chemical Weapons (OPCW):** Implements chemical safety and security programs.

Conclusion

- Labour market governance through the inspection system needs urgent reform. Only then can we prevent factory accidents and protect workers' lives.
- Given the fast-paced changes in technology and the use of hazardous and chemical substances, increased inspection is crucial.

Source: TH

EFFECTIVE DRUG DELIVERY WITH NANOTECHNOLOGY

Context

- A unique method of drug delivery has been developed with the use of polymeric nanoparticles.

About

- A team of scientists have used a chitin synthesis fungicide, **Nikkomycin**, to develop Nikkomycin loaded polymeric nanoparticles.
  - **Chitin is the chief component of fungal cell walls** and is absent in the human body.
- The drug loaded nanoparticles were found effective against fungal infection known as **Aspergillosis** caused by fungi **Aspergillus flavus** and **Aspergillus fumigatus.**
- The nanoformulation developed was found to be free of **cytotoxic** and **hemolytic** effects.
- The method is useful to patients suffering from asthma, cystic fibrosis, or previous lung disease, human immunodeficiency virus (HIV), cancer, or those exposed to corticosteroid medications for an extended duration.

What is Nanotechnology?

- Nanotechnology refers to the branch of science and engineering devoted to designing, producing, and using structures, devices, and systems by manipulating atoms and molecules at nanoscale, i.e. having one or more dimensions of the order of **100 nanometres** (100 millionth of a millimeter) or less.

Advantages of Nanotechnology in Medical field

- **Targeted Drug Delivery:** Nanoparticles are useful to deliver drugs directly to specific cells, **minimizing damage to healthy tissues** and reducing side effects.
- **Imaging:** Nanoparticles enhance the contrast in imaging techniques like MRI, CT scans, and ultrasounds, enabling more **accurate diagnosis of diseases.**
- **Tissue Engineering:** Nanotechnology is used to create scaffolds that support the **growth and regeneration of tissues,** which can be used in repairing damaged organs or tissues, such as in bone and cartilage repair.
- **Vaccine manufacturing:** Nanoparticles can be used as **adjuvants in vaccines,** enhancing the immune response and improving vaccine efficacy.
- **Nanofibers in Wound Dressings:** Nanotechnology is used to create advanced wound dressings that promote faster healing and reduce the risk of infection.

Concerns of Nanotechnology

- **Health Risks:** The long-term effects of exposure to nanomaterials remain poorly understood. Nanoparticles' ability to penetrate biological membranes raises concerns about potential toxicity and unforeseen health impacts, especially in food products.

- **Ethical risks.** There are ethical concerns surrounding the use of nanotechnology. In the healthcare industry, the introduction of nanotechnology could lead to harmful side effects and raises questions around data privacy as well.
- **Lack of Standards:** The rapid development of nanotechnology has outpaced the creation of regulatory frameworks. There is a concern that current regulations may not adequately address the unique risks posed by nanomaterials.

Way Ahead

- Researchers and companies should be **transparent about their findings**, especially regarding the potential risks of nanotechnology.
- Regulatory agencies should **monitor the development and use of nanotechnology** and ensure that companies comply with safety standards.
- Research and development should focus on creating **sustainable and environmentally friendly nanomaterials**. Open access to data and peer-reviewed publications can help build public trust.

Source: PIB

INCREASE IN GLOBAL FLOODING INCIDENCE

In News

- A new study has predicted that **global flooding incidence could increase by 49 per cent** between 2020 and 2100 if the world continues to follow the ominous path of emitting greenhouse gases en route development.

About

- Researchers created a high-resolution Global Flood Map (GFM) using updated techniques to better simulate flood behaviors and adjust probabilities based on factors like rainfall, river discharge, and sea level rise.

Key findings of study

- **Geographical Variations:** Flood risk will vary significantly; some areas may experience a decrease in risk, while others may face increases far exceeding the global average.
- **Region**: The greatest increases in flooding are expected around coastlines in tropical Africa and Asia, and in arid North Africa.
    - The North Atlantic and Indian Ocean coasts, southeastern Asia, and Pacific Islands will also be notably affected.
- **Risk Assessment for 2050:** Flood risk is projected to be 7% under low emissions and 15% under high emissions.
- **Coastal Flood Hazard**: Coastal flooding risk is expected to almost double (99% increase) by 2100, even under a low emissions scenario, due to rising mean ocean temperatures and expanding sea levels.
- **River-Triggered Flooding**: Increased risk of river-triggered flooding is projected for sub-Saharan Africa, parts of Asia, and South America.
- **Rainfall-Induced Flooding**: Flooding due to rainfall is likely to increase by 6% under low emissions and 44% under high emissions scenarios by 2100.

Causes of Global Flooding

- **Climate Change:** One of the primary drivers of increased flooding is climate change.
    - Rising global temperatures lead to more intense and frequent precipitation events. Warmer air holds more moisture, which can result in heavier rainfall..
- **Urbanization**: Rapid urban development often leads to increased impervious surfaces, such as roads and buildings, which reduce the land's ability to absorb rainwater.
    - This can overwhelm drainage systems and result in localized flooding.
- **Deforestation** : The destruction of forests for agriculture and development reduces the land's ability to absorb water. Deforestation increases runoff and can lead to more severe and frequent flooding.
- **Infrastructure Failures**: Aging or inadequate infrastructure, such as levees, dams, and stormwater management systems, can fail under extreme weather conditions.

Impacts of Global Flooding

- **Displacement:** Communities affected by severe flooding often face displacement and loss of homes.
- **Health:** Flooding poses significant health risks, including waterborne diseases, injuries, and fatalities.
    - Displaced populations often face challenges accessing medical care and clean water, exacerbating health issues.

- **Economic Losses:** Floods can cause extensive damage to property, infrastructure, and agriculture. The economic cost includes repair and rebuilding expenses, loss of business, and disruption of economic activities.
- **Environmental Damage**: Floods can have detrimental effects on ecosystems, including soil erosion, habitat destruction, and pollution of waterways.
  - The introduction of pollutants from industrial sites and sewage can degrade water quality and harm wildlife.

Mitigation and Adaptation Strategies

- **Improved Infrastructure**: Investing in resilient infrastructure is crucial for flood management.
  - This includes upgrading drainage systems, building flood barriers, and maintaining and improving existing flood defenses.
- **Sustainable Urban Planning**: Adopting sustainable urban planning practices can mitigate flooding risks.
  - This involves integrating green spaces, improving land use practices, and ensuring that development does not exacerbate flood risks.
- **Early Warning Systems**: Advancing early warning systems and emergency response mechanisms can help communities prepare for and respond to flooding more effectively.
- **Restoration of Natural Ecosystems**: Restoring wetlands, forests, and other natural landscapes can enhance water absorption and reduce flood risks.
- **Climate Change Mitigation**: Addressing the root cause of increased flooding requires global efforts to combat climate change. Reducing greenhouse gas emissions, transitioning to renewable energy sources, and adopting climate-resilient practices are essential steps.

Source: DTE

INDIA'S ETHANOL BLENDED PETROL (EBP) PROGRAMME

Context

- India is on its way to achieve its **target of blending 20% of petrol with ethanol by 2025-26**.

About

- **20% by 2025-26** would mean producing some 1,000 crore litres of ethanol for blending with petrol.
- Taking stock in December 2023, India's ethanol production capacity had already increased to 1,380 crore litres — **some 875 crore litres capacity from sugarcane and 505 crore from foodgrains.**
  - This means the targeted total ethanol capacity is nearly achieved although with a **greater sugarcane-based component.**
- Government policy is that **maize as well as surplus rice and damaged grains** will be used **to feed grain-based distilleries.**

Ethanol

- Ethanol, an anhydrous ethyl alcohol having chemical formula of C2H5OH, can be produced from **sugarcane, maize, wheat, etc** which are having high starch content.
- In India, ethanol is mainly produced from sugarcane molasses by fermentation process.
- It can be mixed with gasoline to form different blends.

Ethanol Blending

- Ethanol blending refers to the **practice of mixing ethanol with gasoline** to create a fuel mixture that can be used in internal combustion engines.
- **There are a few common blends:**
  - **E10:** This is a mixture of 10% ethanol and 90% gasoline. It is the most common blend and is used widely in many countries.
  - **E15:** This blend contains 15% ethanol and 85% gasoline.
  - **E85:** This is a high-ethanol blend, consisting of 85% ethanol and 15% gasoline. It's used in flex-fuel vehicles designed to run on higher ethanol content.
- **Significance:** As the ethanol molecule contains oxygen, it allows the engine to more completely combust the fuel, resulting in fewer emissions and thereby reducing the occurrence of environmental pollution.
  - Since ethanol is produced from plants that harness the power of the sun, ethanol is also considered as renewable fuel.

India's Ethanol Blending Program

- The Ethanol Blended Petrol (EBP) programme was launched in **2003**.
  - The programme sought to promote the use of alternative and environment friendly fuels and to reduce import dependency for energy requirements.

- **Objectives**
  - **Reduce Import Dependence:** India aims to decrease its reliance on imported crude oil, thereby improving energy security.
  - **Environmental Benefits:** Ethanol is a cleaner-burning fuel compared to gasoline, which helps in reducing air pollution and greenhouse gas emissions.
  - **Support for Farmers:** The program supports the agricultural sector by providing a market for ethanol, which is often derived from sugarcane, corn, or other crops.
- **Key Components**
  - **Blending Targets:** India has set specific targets for ethanol blending. For instance, the National Policy on Biofuels (2018) outlines a target of 20% ethanol blending in petrol by 2025.
  - **Phased Implementation:** The blending targets are being rolled out in phases. Initially, the focus was on achieving a 10% ethanol blend (E10) by 2022, and the program is gradually moving towards higher blends like E20.
  - **Infrastructure Development:** The government has been investing in the infrastructure necessary for ethanol production, storage, and distribution, including establishing more ethanol production facilities and blending units.
  - **Incentives and Support:** Various financial incentives and support mechanisms are provided to encourage ethanol production and blending. This includes subsidies for ethanol producers and incentives for upgrading infrastructure.

Challenges

- **Infrastructure:** Developing the necessary infrastructure for large-scale ethanol production and blending can be complex and costly.
- **Feedstock Availability:** Ensuring a steady and adequate supply of raw materials for ethanol production, such as sugarcane, can be challenging, especially in the face of changing agricultural conditions and market fluctuations.
- **Consumer Acceptance:** Educating consumers and ensuring that vehicles can run efficiently on higher ethanol blends are also important for the program's success.

Conclusion

- India's Ethanol Blending Program is a significant step towards a more sustainable and self-reliant energy future, aligning with broader goals of environmental protection and energy independence.

Source: TH

NEWS IN SHORT

MODEL CODE OF CONDUCT

Context

- Recently, the Election Commission of India (ECI) asked the Haryana government not to declare the results of its ongoing recruitment drive in the State till the completion of the Assembly polls.

About the Model Code of Conduct

- It is like the rulebook for political parties and candidates during elections in India. It's a set of guidelines published by the Election Commission of India (ECI).
- The MCC came into action **as soon as the EC announced the election schedule.**
- It **isn't a statutory document** enforceable by Parliament-made laws.
- However, some actions listed in the MCC are also considered **"electoral offences" and "corrupt practices"** under the **Representation of the People Act, 1951**.

What does the MCC cover?

- **Election Campaign and Polling Behavior:** It sets standards for how political parties and candidates should conduct themselves during election campaigns and polling.
- **Complaint Mechanism:** It explains how parties can lodge complaints with EC observers in case of disputes.
- **Ministers in Power:** When the MCC is in force, it even tells ministers from ruling parties how to behave.
- **Election Manifestos:** Parties shouldn't promise things that go against the ideals of our Constitution.

Source: TH

VACCINE-DERIVED POLIOVIRUS (VDPV)

In News

- Senior Union Health Ministry official said that the Polio case in Meghalaya is vaccine-derived.

About

- Vaccine-derived poliovirus (VDPV) is a strain related to the weakened live poliovirus in the oral polio vaccine (OPV).
  - If VDPV circulates in under- or unimmunized populations or replicates in an immunodeficient person, it can revert to a form that causes illness and paralysis.
  - VDPVs arise in under-immunized populations where the weakened virus from OPV can spread and mutate.

Polio

- It is a highly infectious disease mainly affecting children under five, causing permanent paralysis in about 1 in 200 infections or death in 5-10% of those paralyzed.
- **Transmission**: The virus spreads from person-to-person primarily through the fecal-oral route or occasionally via contaminated water or food.
- **Symptoms**: Initial symptoms include fever, fatigue, headache, vomiting, neck stiffness, and limb pain. Paralysis occurs in a small percentage of cases and is often permanent.
- **Vaccine and Prevention**: There is no cure for polio, but it is preventable through immunization.

Source: IE

NEW FOSTER CARE RULES IN INDIA

In News

- The Women and Child Development (WCD) Ministry in India now allows single individuals, regardless of marital status, to foster children, with the option for adoption after two years.

About foster care rules in India

- **Eligibility**: Individuals aged 35 to 60 can foster children.
  - Single women can foster and adopt any gender, while single men can only foster and adopt male children.
- Previously, foster care was restricted to married couples, with a mandatory five-year fostering period before adoption.
  - The mandatory fostering period before adoption is now reduced to two years.
  - Married couples must have a stable marital relationship of at least two years to foster.
- **Age Criteria:** For married couples, the combined age must be at least 70 years for fostering children aged 6-12 or 12-18.
  - Single individuals must be between 35-55 years for fostering children aged 6-12 and between 35-60 years for those aged 12-18.
- **Registration**: Prospective foster parents can now register online via the Child Adoption Resource Information and Guidance System (CARINGS) and a new dedicated online portal.
- **Alignment with Laws**: The revised guidelines align with the 2021 amendments to the Juvenile Justice Act and the 2022 Model Rules, distributed to states in June 2024.

Source : BS

MALAYSIA'S TWEAKED 'ORANGUTAN DIPLOMACY'

Context

- Malaysia has proposed that importers of Malaysian palm oil will be offered to "sponsor" one or more orangutans and the funds will be used for their conservation within Malaysia.

Background

- In its earlier move, Malaysia intends to gift orangutans to palm oil-purchasing countries as part of an initiative similar to China's panda diplomacy.
- However it was severely criticized by the animal welfare groups of Malaysia.

Orangutan

- **Characteristics:** Orangutans are the **largest arboreal mammal,** spending most of their time in trees.
  - They are the closest living relatives of humans and they share **96.4%** of Human genes and are highly intelligent creatures.
- **There are three species of Orangutan** – the Bornean, Sumatran and Tapanuli – which differ a little in appearance and behavior.
- **Eating habitats :** Orangutans mainly eat fruits, such as mangoes, lychees and figs, but they also feed on young leaves, flowers, insects, and even small mammals.
- **Habitat and Distribution:** They can occur up to **1,500m** above sea level, most are found in lowland areas and prefer forests in river valleys or floodplains.

- These great apes are only found in the wild on the islands of Borneo and Sumatra.
- **IUCN status:** All three orangutan species are **critically endangered.**

Palm Oil

- It's an **edible vegetable oil** that comes from the fruit of oil palm trees, having the scientific name **Elaeis guineensis.**
- The oil palm tree is **native to West and Central Africa.** It also grows extensively in **Malaysia and Indonesia.**
  - **Malaysia** is the world's **second-largest** palm oil producer.
- **Palm oil,** obtained from the fruits, is used in making soaps, cosmetics, candles, biofuels, and lubricating greases and in processing tinplate and coating iron plates.
- **Palm kernel oil**, from the seeds, is used in manufacturing such edible products as margarine, ice cream, chocolate confections, cookies, and bread, as well as many pharmaceuticals.

Source: IE

HAYFLICK LIMIT

Context

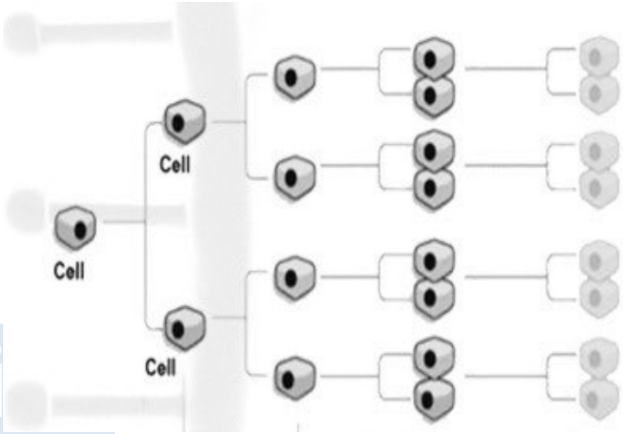
- Recently, Biomedical researcher Leonard Hayflick died at the age of 98, who discovered the Hayflick Limit.

About the Hayflick Limit

- It is a concept that fundamentally changed our **understanding of ageing** by showing that **normal somatic cells can divide** (and thus reproduce) **only a certain number of times.**
- It's named after Dr. Leonard Hayflick, a biomedical researcher who made a groundbreaking discovery in the early 1960s.

How does it work?

- There's an **in-built cellular clock within our bodies** (and in other organisms) that determines how long we can live.
- When these cells **reach their division limit, they become senescent**—essentially retiring from further replication.
- As these senescent cells accumulate, our bodies begin to age and decline.



- The **ultimate Hayflick limit for humans** is estimated to be **around 125 years.**
- **Beyond Limits:** No amount of diet, exercise, or genetic modification can extend life beyond this limit.

Telomeres: Aging Safeguard

- Hayflick's discovery gained even more weight when researchers in the 1970s stumbled upon telomeres.
- As cells divide, they create copies of DNA, but with each division, telomeres get slightly shorter. Eventually, they reach a critical point where cell division stops altogether.
- Scientists **continue to explore** whether telomere loss and the Hayflick limit are mere symptoms of aging or actual limits.

Future Research Directions

- Ongoing studies aim to explore the mechanisms behind the Hayflick limit and its implications for health and longevity. Researchers are investigating ways to mitigate the effects of cellular senescence and extend healthy lifespan.

Source: IE

QUANTUM NONLOCALITY

Context

- New study demonstrated that a **universal standard for measuring quantum nonlocality is impossible.**

About

- **Quantum nonlocality** describes a strange connection between distant physical objects, one that doesn't allow for faster-than-light communication.
  - It describes a situation where particles that are entangled can influence each other instantaneously, regardless of the distance separating them.
  - This phenomenon appears to violate the classical idea that information or influence cannot travel faster than the speed of light.
- The new research **broadens the potential applications of quantum non-local correlations,** which are already used in secure communication, random number generation, and cryptographic key creation.
- This discovery adds a new layer to the understanding of quantum mechanics, highlighting the complexity and uniqueness of quantum nonlocality as a valuable and diverse resource.

Source: DST

METTUKURINJI (STROBILANTHES SESSILIS)

Context

- **Mettukurinji of Western Ghats** need conservation due to their depleting numbers.

About

- Endemic to Western Ghats, Mettukurinji (also called Topli karvy) belongs to the **Acanthaceae family**, with 450 species native to wet tropical biomes of Asia and Madagascar.
- Mettukurinji is confined to the **periphery of the northern side of the Western Ghats**, they flower **every seven years.**
- The flower is a **ravishing impression of the Neelakurinji** that blossoms **every 14 years.**

- India is the hotspot for the highest diversity of **Strobilanthes** accommodating over 160 species of which 72 are endemic to Sahyadris.
  - Their enchanting **compact flowers in different tinctures of purple, lavender and blue offers explicit view to tourists.**
- **Threats:** They are seen to reduce in numbers due to **monocarpy** (the trait of flowering once and then dying) which can be attributed to their **sensitivity to rainfall and heat.**
  - **Frequent landslides and floods** are threatening grasslands and will inevitably deplete this plant.
  - **Twitching of flower bunches by visitors** is another contributing factor of their disappearance from the landscape.
- **Neelakurinji** is classified as a **'threatened' species by the IUCN.**

Source: DTE

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