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Current affairs summary for prelims

19 January, 2024

Reduction in Size of Animals and Cope's Rule

Context: *Researchers claim to have cracked the mystery of dinosaurs shrinking like tiny lizards. Despite this, animals are still getting smaller due to climate change.*

➢ **Animal Size Changes Over Time:**
- Research challenges Cope's Rule, suggesting a tendency for many animal groups to evolve larger body sizes over thousands and millions of years.
- Clear exceptions to Cope's Rule observed, such as reptiles shrinking from the size of giant dinosaurs to hand-sized geckos and sparrows.

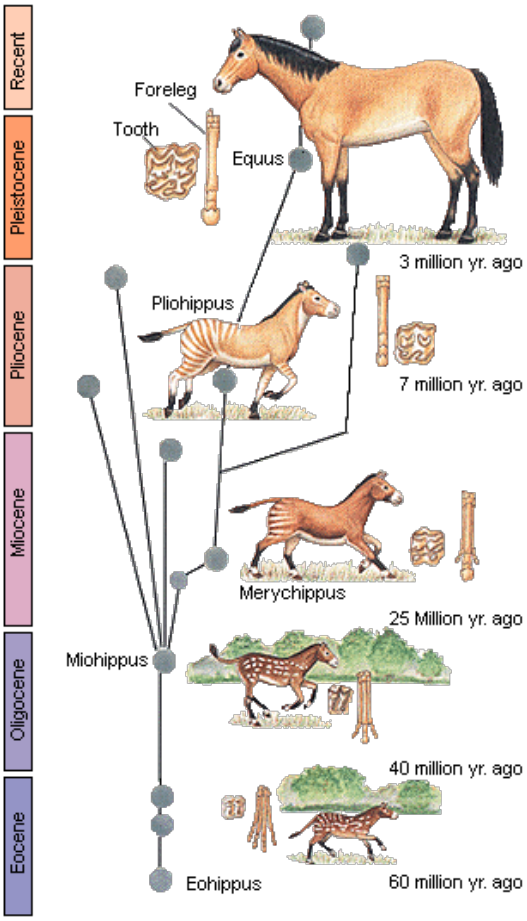
➢ **Factors Influencing Animal Size Evolution:**
- Three scenarios identified through computer models simulating evolution in different ecological and physiological conditions.
  - Animals increase in size over time due to less competition between species, especially when food is abundant (e.g., Jurassic period).
  - Some animals grow larger and then become extinct, meeting competitive demands but facing environmental catastrophes or being out-competed.
  - Species shrink over time in conditions of high competition and habitat/resource overlap, adapting to distribution of resources and competitors.

➢ **Climate Change and Animal Size:**
- Explanation for ongoing animal size reduction attributed to rapid adaptation to changing climate.
- Polar bears, among other species, shrinking as a response to habitat destruction and more dramatic temperature rises.
- Natural selection favoring smaller animals as the planet heats up, reversing historical patterns observed during the Ice Age.

➢ **Historical Examples of Animal Size Changes:**
- Examples include Alaskan horses shrinking by around 12% between 24,000 and 14,500 years ago, and dinosaurs and woolly mammoths growing and then going extinct.
- Historical patterns show confusing mixes of size evolution, with some lineages shrinking and others growing, influenced by ecological factors and competition.

➢ **Implications for Extinction and Survival:**
- Discussion on how animal size evolution impacts vulnerability to extinction.
- Larger, less numerous animals can be more vulnerable to extinction, as seen with dinosaurs.
- Climate-induced habitat changes amplifying conditions leading to rapid shrinking in animal size and potential extinction.

➢ **Cope's Rule**
- **Origins of Cope's Rule:** Named after American paleontologist Edward Drinker Cope, but it was not explicitly stated by him. Cope favored the idea of linear evolutionary trends.
- **Alternative Names:** Also known as the Cope–Depéret rule, as Charles Depéret explicitly supported the concept. Theodor Eimer had advocated it earlier. The term "Cope's rule" was coined by Bernhard Rensch based on Depéret's admiration for Cope.



- **Evolutionary Trend:** Postulates that population lineages generally increase in body size over evolutionary time, though not directly stated by Cope.
- **Exceptions and Limitations:** Demonstrated in many cases, but it does not hold true across all taxonomic levels or in all clades. Larger body size is linked to increased fitness but comes with disadvantages, such as higher extinction risk for clades with larger individuals.
- **Fitness and Extinction Factors:** Larger body size is associated with enhanced fitness for various reasons. However, clades with larger individuals may be more prone to extinction, acting as a limiting factor for the maximum size of organisms.

Commercial Release of GM Crops

Context: *The highest court withholds its decision on Public Interest Litigations (PILs) challenging the government's decision to commercially release the genetically modified mustard variant DMH-11.*

➢ **Government's Position:**
- Opposition to GM crops, specifically DMH-11, is labeled as unfounded by the government.
- The resistance is seen as detrimental to farmers, consumers, and industrial interests.

- **Current GM Crop Integration:**
  - India is already involved in importing and consuming oil produced from GM crops, particularly highlighting the utilization of such technology.
  - The government stresses the importance of genetic technologies in addressing evolving challenges in agriculture and ensuring food security.
- **Economic Impact:**
  - Imposing a ban on the commercial release of GM crops is viewed as contrary to public and national interests.
  - Statistics reveal a substantial portion of India's edible oil demand is met through imports, emphasizing the economic repercussions of foreign dependency.
- **Potential Benefits of GM Mustard (DMH-11):**
  - DMH-11 is presented as having the potential to enhance per-hectare yield, contributing to a significant increase in domestic edible oil production.
  - The government asserts that genetic modification technology is pivotal in overcoming agricultural challenges, thereby reducing reliance on foreign imports.
- **Addressing Environmental Concerns:**
  - Trials of DMH-11 are explicitly mentioned to have been conducted under controlled circumstances at specific locations, emphasizing precautions.
  - The government highlights the existence of a comprehensive statutory framework governing the research, development, and commercial use of GM technologies.
  - No identified flaws in the current regulatory regime for GM crop trials are acknowledged.
- **Economic and Regulatory Framework Significance:**
  - The government cites the economic losses attributed to crop damage by weeds, underscoring the importance of GM crops in effective weed control.
  - The introduction of GM crops is portrayed as a policy decision based on expert opinion and thorough trials, supported by an extensive statutory scheme.
  - The petitioners are criticized for not identifying any flaws in the existing regulatory framework or its implementation regarding the trial of DMH-11.
- **GM Crops**
  - Genetically modified (GM) crops, also called biotech or genetically engineered (GE) crops, undergo non-natural genetic alterations for specific traits.
  - **Genetic Modification Techniques:** Techniques like recombinant DNA and gene editing (e.g., CRISPR-Cas9) are used for targeted changes in the plant's DNA.
  - **Traits in GM Crops:**
    - **Pest Resistance: Some GM crops produce insect-toxic proteins, e.g., Bt cotton.**
    - **Herbicide Tolerance:** Certain GM crops endure specific herbicides, aiding weed control.
    - **Disease Resistance:** Genetic modification reduces crop losses by conferring disease resistance.
    - **Improved Nutrition:** GM crops like "Golden Rice" are designed for enhanced nutritional content, containing elevated beta-carotene levels.

Breaking the Vicious Circles of Informal Employment and Low-Paying Work

Context: *The majority of the world's employed population works in informal settings, according to a new report by international policy advisor Organisation for Economic Co-operation and Development (OECD).*

- **Majority in Informal Settings:** New OECD report highlights that the majority of the world's employed population works in informal settings, leading to high poverty and occupational risks.
- **Vulnerabilities in Informal Economy:** Lack of adequate social protection for informal workers leaves them and their families vulnerable to various risks.
- **Impact on Children:** Children in households where all family members work informally inherit vulnerabilities, creating a cycle of challenges.
- **Informal Household Statistics:** Around 60% of children under 15 in developing economies live in fully informal households, with figures exceeding 80% in some African countries.
- **Four Identified Ways Children Inherit Vulnerabilities:**
  - Exposure to direct informal employment in fully informal households.
  - Widening school attendance gaps between children from fully informal, mixed, and formal households.
  - Limited financial resources and parental time allocated for their education.
  - Longer and more uncertain transitions from school to work for children from informal households.
- **Impact on Formal Job Opportunities:** Likelihood of landing formal jobs is influenced not only by individual education but also by parents' education and employment. Children from fully informal households are more likely to work informally as adults.
- **School Attendance Disparities:** Children from fully informal households show significantly lower school attendance rates compared to those from mixed or fully formal households.
- **Educational Spending Disparities:** Formal households spend more on education per child than informal households, leading to early educational disparities.
- **Effect of COVID-19 Crisis:** Existing educational inequalities are exacerbated by the COVID-19 crisis, limiting access to parental assistance.
- **Disadvantage for Young People:** Young people from informal households have higher shares of 'not in education, employment, or training' (NEET) compared to those from mixed and fully formal households.
- **Informal Apprenticeships:** In sub-Saharan Africa, informal apprenticeships are common, with over three-quarters of young people in developing economies starting employment in informal settings.

- **Regional Disparities in Formal Employment:** Young workers have better chances of finding formal work in Europe, Central Asia, and Latin America, while up to 95% of young workers in sub-Saharan African countries are in informal employment.
- **Proposed Policies:** The report recommends policies such as investing in accessible quality education, preventing school dropouts, and smoothing school-to-work transitions for young people from informal households.
- **Need for Collaboration:** Effective implementation of proposed policies requires collaboration between government agencies, educational institutions, employers, and civil societies.

Note: Earnings categories are defined based on the total earnings distribution: low earnings are from the bottom of the distribution to 50% of the median earnings level; medium earnings are from 50% of the median to 150% of the median; and high earnings are 150% of the median and above. LAC – Latin America and the Caribbean; ECA – Europe and Central Asia; Bolivia – Plurinational State of Bolivia (hereafter Bolivia); China – People's Republic of China (hereafter China).
Source: Authors' calculations based on (OECD, 2021[3]), *Key Indicators of Informality based on Individuals and their Household (KIIbIH)* (database), https://www.oecd.org/dev/key-indicators-informality-individuals-household-kiibih.htm.

NEWS IN BETWEEN THE LINES

Organisation for Economic Co-operation and Development

Recently, the international policy advisor, Organisation for Economic Co-operation and Development (OECD) has revealed that the vulnerability risks faced by informal workers are now impacting their children.

About Organisation for Economic Co-operation and Development:

- The Organisation for Economic Co-operation and Development (OECD) is an **intergovernmental economic organization.**
- It was established on **December 14, 1961** by the **18 European nations** to promote global trade and economic development.
- Its purpose is to encourage **economic** growth and **international trade**.
- It **publishes economic reports**, **statistical databases**, analyses and forecasts on the outlook for economic growth worldwide.
- It also **maintains a "blacklist"** for those countries that it considers to be uncooperative tax havens.
- It is a forum where **38 democracies** with market-based economies collaborate to develop policy standards to promote sustainable economic growth.
- It was **originated in 1948,** as the Organisation for European Economic Co-operation (**OEEC**) and renamed as the OECD in 1961 when the **USA and Canada** joined to reflect a broader membership.
- Its headquarter is in **Paris, France**.
- Its **Secretary-General is Mathias Cormann**, who was **appointed in 2021** for a five-year term.

Statute of Social Justice

Today, the Chief Minister of Andhra Pradesh will unveil the Statue of Social Justice, a 125-foot statue of Dr B.R. Ambedkar at Swaraj Maidan in Vijayawada.

About the Statue of Social Justice:

- The Statue of Social Justice, a non-religious statue is a **206-foot-tall monument (stands on an 81-foot pedestal**) located in the **Dr. B.R. Ambedkar Smriti Vanam, Andhra Pradesh.**
- It's the **second tallest standing statue** in India and the **fourth tallest overall**.
- "This towering statue **reflects Dr. Ambedkar's immense contribution** to India's social, economic, political and gender landscapes.
- The statue is **made of a steel frame with bronze cladding**, entirely manufactured in India.
- Around **400 MT** of stainless steel and **120** metric tonnes of bronze were used for the construction of the statue.

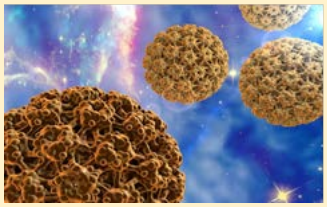
White Gold

Recently, Bharuch's petrochemical industrial cluster has raised concerns due to its adverse effects on the region's key agricultural product, cotton, often referred to as 'white gold.'

About White Gold:

- Cotton, is a **semi-xerophyte** and crucial **commercial crop** in India, contributing to approximately **25% of global cotton production**.
- It is often referred to as "White-Gold" due to its economic importance in the country.
- Around **67% of India's cotton** is cultivated in rain-fed areas, while **33%** is grown in irrigated regions.
- It is grown on a variety of soils ranging from well drained deep alluvial soils to **black clayey soils.**
- India is the only country cultivating all four species of cotton: **Gossypium arboreum, G. herbaceum, G. barbadense and G. hirsutum.**
- Ten major cotton-growing states are categorized into three agro-ecological zones: **Northern Zone** (Punjab, Haryana and Rajasthan), **Central Zone** (Gujarat, Maharashtra and Madhya Pradesh) and **Southern Zone** (Telangana, Andhra Pradesh, Karnataka and Tamil Nadu).
- **Cottonseed oil** ranks as the **third-largest domestically-produced** vegetable oil in India, following mustard and soybean.
- Cottonseed oil is **used for cooking** and the leftover cottonseed cake serves as a vital feed ingredient for livestock and poultry.

Human Pappilomavirus



Recenlty, the World Health Organisation has revealed that Cervical cancer, the second-most common cancer among women in India, is caused by the persistent human papillomavirus infection.

Human Pappilomavirus:

- The human papillomavirus (HPV) is a **family of DNA viruses** that can infect the epithelium.
- It is the most common sexually transmitted infection (STI) in the United States.
- It is usually harmless and goes away on its own, but **some types can lead to cancer or genital warts.**
- It is **transmitted through skin-to-skin** contact, **during vaginal, anal or oral sex** with someone who has the virus.
- It is estimated that every year around 1.25 lakh women are diagnosed with cervical cancer, and nearly 75,000 of them die.
- India accounts for nearly 25% of global cervical cancer deaths.
- In **2022, the WHO adopted a strategy** to eliminate cervical cancer globally.
- The strategy includes ensuring **90% of girls** are fully vaccinated with the HPV vaccine by **2030**.
- Two vaccines, **Gardasil and Cervavac** are available in India.

Place in News

Taiwan

Recenlty, Lai Ching-te, from Taiwan's ruling Democratic Progressive Party has won the presidential election and marking the DPP's third consecutive victory with a pro-independence stance.

Taiwan (Capital: Taipei)

Location: Taiwan, officially the Republic of China, is an Island country in East Asia located at the juncture of the East and South China Seas.

Boundaries: Taiwan is surrounded by the People's Republic of China (PRC), Japan and the Philippines. It is also surrounded by bodies of water, including **the Philippine Sea** (East), the **East China Sea (N orth)**, the **Luzon Strait** (South) and the South China Sea (Southwest).

Physical Features:

- The **highest peak, Yu Shan**, stands at 3,952 meters, making Taiwan one of the world's highest islands.
- Taiwan's longest river is **the Cho-shui (Zhuoshui**) River, which is 116 miles long.
- The **Kaoping (Gaoping**) River in the south has the largest drainage basin.

POINTS TO PONDER

- Which organizations are involved in the joint venture that established India Innovation Centre for Graphene (IICG)? **- Centre for Materials for Electronics Technology (C-MET), Tata Steel Limited and Digital University of Kerala**
- Which body is responsible for the implementation of the National Quantum Mission (NQM)? **- Department of Science & Technology (DST)**
- Where is the Global Hydrogen Trading Market (GHTM) planned to be established in collaboration with IFSC-GIFT City? **- Gandhinagar, Gujarat**
- What is the name of the river formed after the confluence of Imphal and Iril rivers? **- Manipur River**
- What is the material used to carve the Guruvayur temple also known as the Dwarka of the South temple, where the Prime Minister of India visited recently? **- Patala Anjana stone**