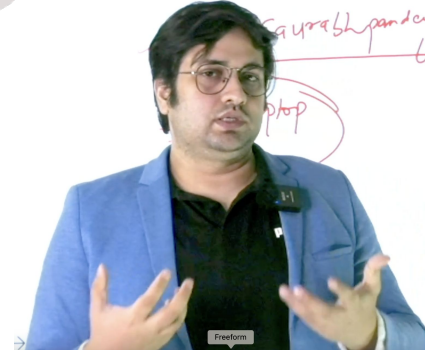


# Topics - MINDS MAPS included (Daily current affairs)-- 29th & 30th september



2024

- Dark matter
- Pollen:
- Why Tropical Storm John unique ??
- India's GDP Growth and Consumption Dynamics
- Agroforestry and Carbon Finance in India
- "The Summit of the Future"
- Why Flood in Nepal?
- Supreme Court Ruling Regarding the POCSO Act



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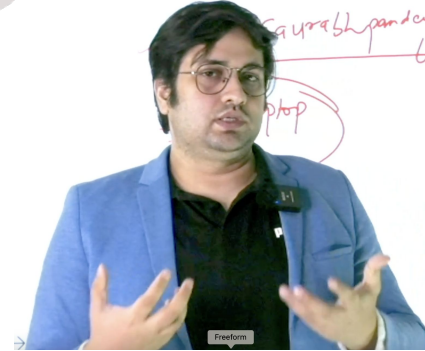


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- Impact of Dead Coral Skeletons
- Embryonic Diapause
- \_\_\_\_\_
- Pigs and Rat Hepatitis E Virus Transmission



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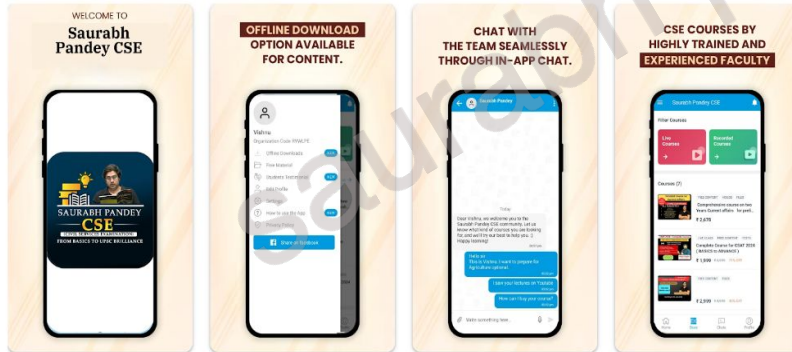
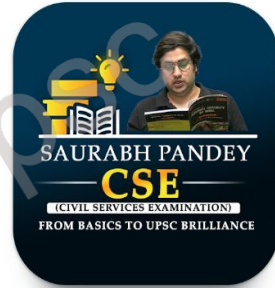
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# Topic- DARK MATTER

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**Dark Matter:** Comprises most of the universe's mass.

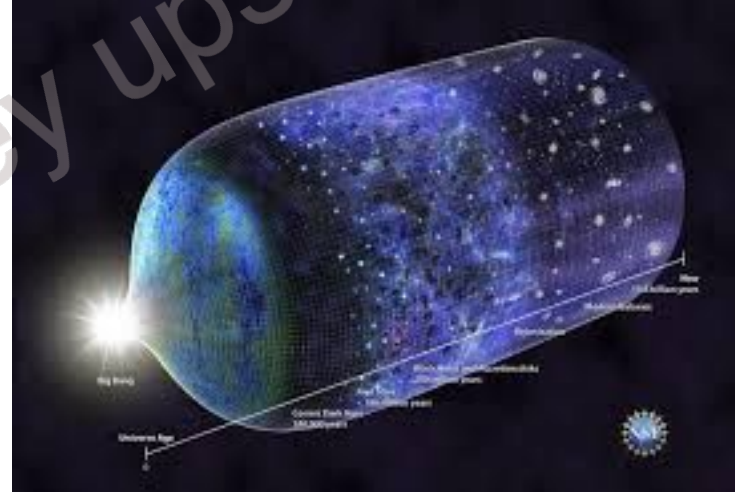
**Visible Matter:** Stars, gas, and planets make up only 15% of total mass.

**Significance:** Shapes the cosmos and influences cosmic structures.

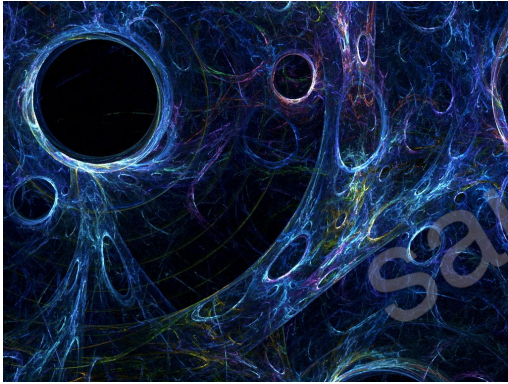
**Unknown Particle:** Theories suggest dark matter is made of particles that don't interact with light.

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**Age: Hypothetical particles could exist for 14 billion years.**

**The researchers' plan is to catch the dark matter in a 'sail' — a detector placed deep underground to shield against other radiation from space. If a nucleus in the detector were seen to recoil, it must be the invisible bump of dark matter. The goal is to measure the unknown mass of the dark particle and the unknown rate at which atomic nuclei scatter dark matter particles. Physicists track this rate using a variable called the cross-section**

---

## Neutrino Fog

**Definition:** A phenomenon related to the behavior of neutrinos and their interaction with dark matter.

**Relevance:** Plays a crucial role in understanding dark matter and the universe.

### Key Points

**Dark Matter Research:** Neutrino fog affects dark matter detection efforts.

**Experiments:** Recent experiments provide insight into this phenomenon



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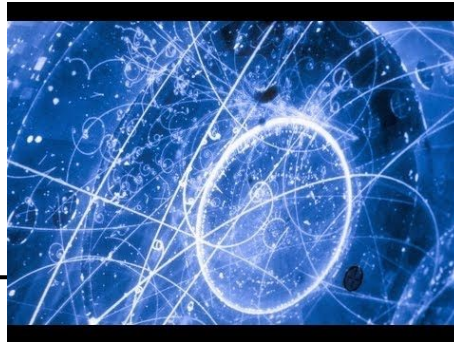
Neutrinos are fundamental particles in physics.

They are known as "ghost particles" due to their elusive nature.

Play a crucial role in understanding the universe.

Neutrinos are produced in nuclear reactions (e.g., the sun).

They help in understanding dark matter and the universe's expansion.



# Topic → Pollen: Nature's Reproductive Substance



## Overview of Pollen

Definition: Pollen is a crucial substance in plant reproduction.

Function: Transports male gametes to the stigma of compatible plants.

Pollen is a gametophyte, a multicellular organism that plays a key role in plant reproduction.

## Key Points on Pollen

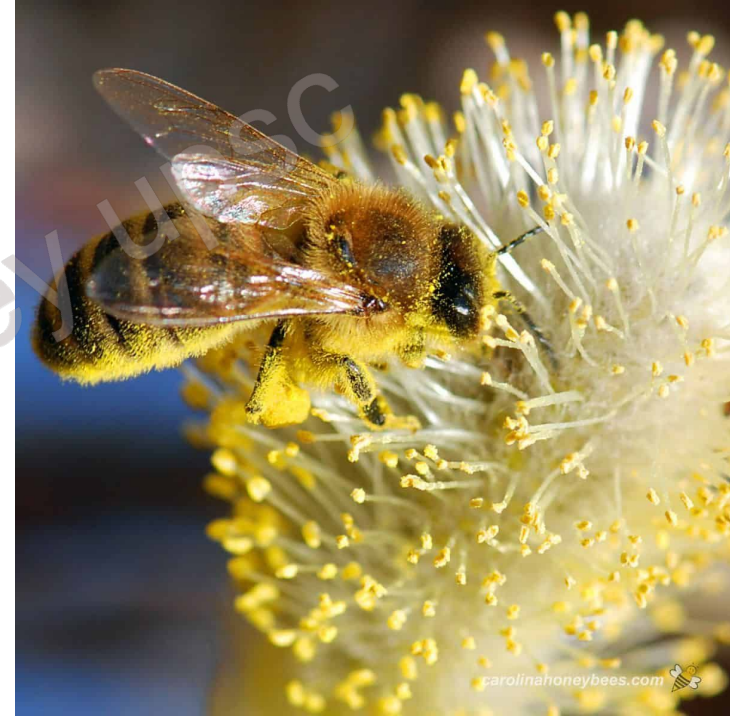
Structure: Composed of reproductive and non-reproductive cells.

Functionality: Initiates pollen tube formation and sperm cell multiplication leading to fruit and seed production.

Environmental Role: Sporopollenin protects pollen during its journey through air.

Health Impact: Allergic reactions predominantly come from certain plants and pollens.





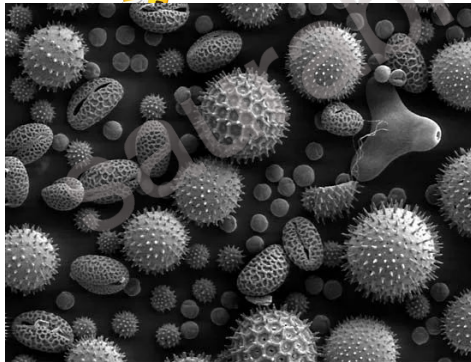
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## Structure of Pollen

Each pollen particle resembles a *powder* when clustered together. Surrounded by sporopollenin, a natural polymer that protects pollen during its journey

Many individuals are allergic to pollen, especially from *anemophilous* plants (e.g., birch and hickory).

Allergic reactions to grass pollen are commonly known as *hay fever*





# TOPIC → Tropical Storm John

## Overview

Type: Tropical Storm/Hurricane

Affected Area: Southern Mexico's Pacific Coast

Impact: Heavy rainfall and flooding

Strength: Regained strength as a 'zombie' storm

Rainfall: Up to 50 inches predicted

Fatalities: At least 22 dead due to mudslides and flooding

Landfall: Made landfall multiple times

Response: Emergency services and evacuations implemented



# Why is Tropical Storm John Unique?

## Factors Contributing to Its Uniqueness

Rapid Intensification 🌀

Transitioning from tropical storm to Category 3 hurricane  
Sudden increase in wind speed and storm strength

Dual Landfalls 🌊

First impact near Manzanillo, Mexico  
Second strike on the same region within days

"Zombie Storm" Phenomenon 🤪

Re-emergence after dissipating  
Unusual behavior for tropical storms



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## Severe Weather Impacts 🌧️

Life-threatening floods and landslides

Extensive rainfall causing damage and casualties

## Geographical Influence 🌍

Affects southern Mexico's Pacific coastline

Specific vulnerability due to geographical features

## Historical Context 📜

Comparison to previous storms

Notable records for the region

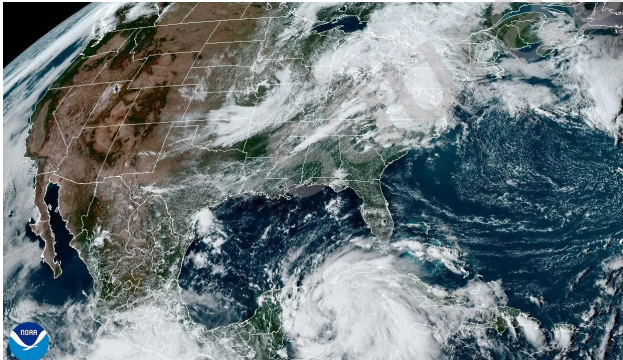
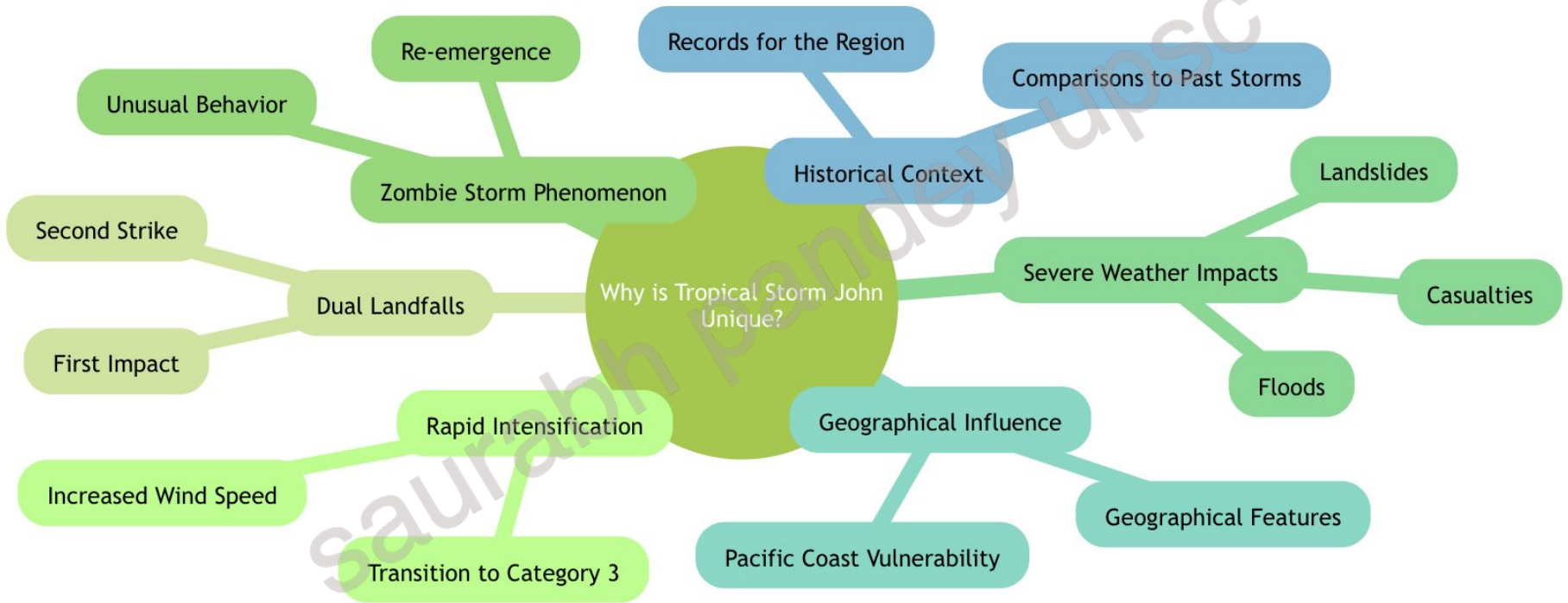



Figure 1.1: Mindmap



# Topic→India's GDP Growth and Consumption Dynamics



## Overview of GDP Growth

Current GDP Growth: 8.2% for 2023-24 

Challenges:

Weak farm sector due to unhelpful monsoon 

Private consumption growth at 4%, lowest since 2002-03

## Key Insights

K-shaped Consumption Pattern: Higher-end goods outperform lower-end sectors.


Rural Demand: Impacted negatively by agricultural performance.

Implications of Growth:

Vital for private investments and job creation.

Normal monsoon expected to aid rural demand recovery.

## Economic Signals

First Quarter Growth: PFCE at 7.4%, exceeding GDP growth of 6.8% 

Rural Wage Growth: Positive trends expected to support consumption.



## Urban Demand Trends

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Emerging Concerns:

Urban demand showing signs of fatigue.

High interest rates affecting spending power.

### Consumer Confidence

RBI Survey: Declining confidence among urban buyers.

Vehicle Sales: Decrease noted from April to August.

Festive Season Outlook:

Potential for recovery through holiday spending.

Critical for sustaining growth momentum.



## Government and Market Strategies

Fuel Price Adjustments: Need for significant cuts to boost consumer spending.  
Global Oil Prices: Declines could support local consumption.

## Monitoring Trends

Ongoing assessment of consumer behavior essential for economic stability.



# Topic->Agroforestry and Carbon Finance in India

## Overview

India's agroforestry sector has vast potential 🌳

Integration with carbon finance projects (ARR)

Opportunity to expand from 28.4 million hectares to 53 million hectares by 2050

Contributes 19.3% to India's carbon stocks 🌍



## Current Status

Agroforestry covers 8.65% of total land area

Could provide an additional carbon sink of 2.5 billion tons of CO<sub>2</sub> by 2030 if supported by policies and financial incentives 💰



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## Challenges

### Common Practice in Carbon Standards

Key criterion for assessing additionality in projects

Current standards often reflect conditions of large-scale agriculture

India's fragmented landholdings pose a challenge for small farmers 🚜

### Need for India-Centric Approaches

Redefining "common practice" to address unique Indian agricultural landscapes

Unlocking potential for carbon sequestration through systematic agroforestry techniques 🌱

Encouraging participation of small and marginal farmers in carbon finance projects

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## Benefits of Agroforestry

Addresses low productivity and environmental degradation

Provides additional income streams through carbon credits

Enhances soil fertility, improves water retention, and mitigates erosion 🌧️

## Research and Implementation

The Energy and Resources Institute (TERI) has initiated 19 projects benefiting over 56,600 farmers

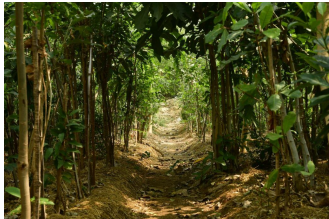
Need for international carbon finance platforms to revise standards for better alignment with Indian agriculture 📈

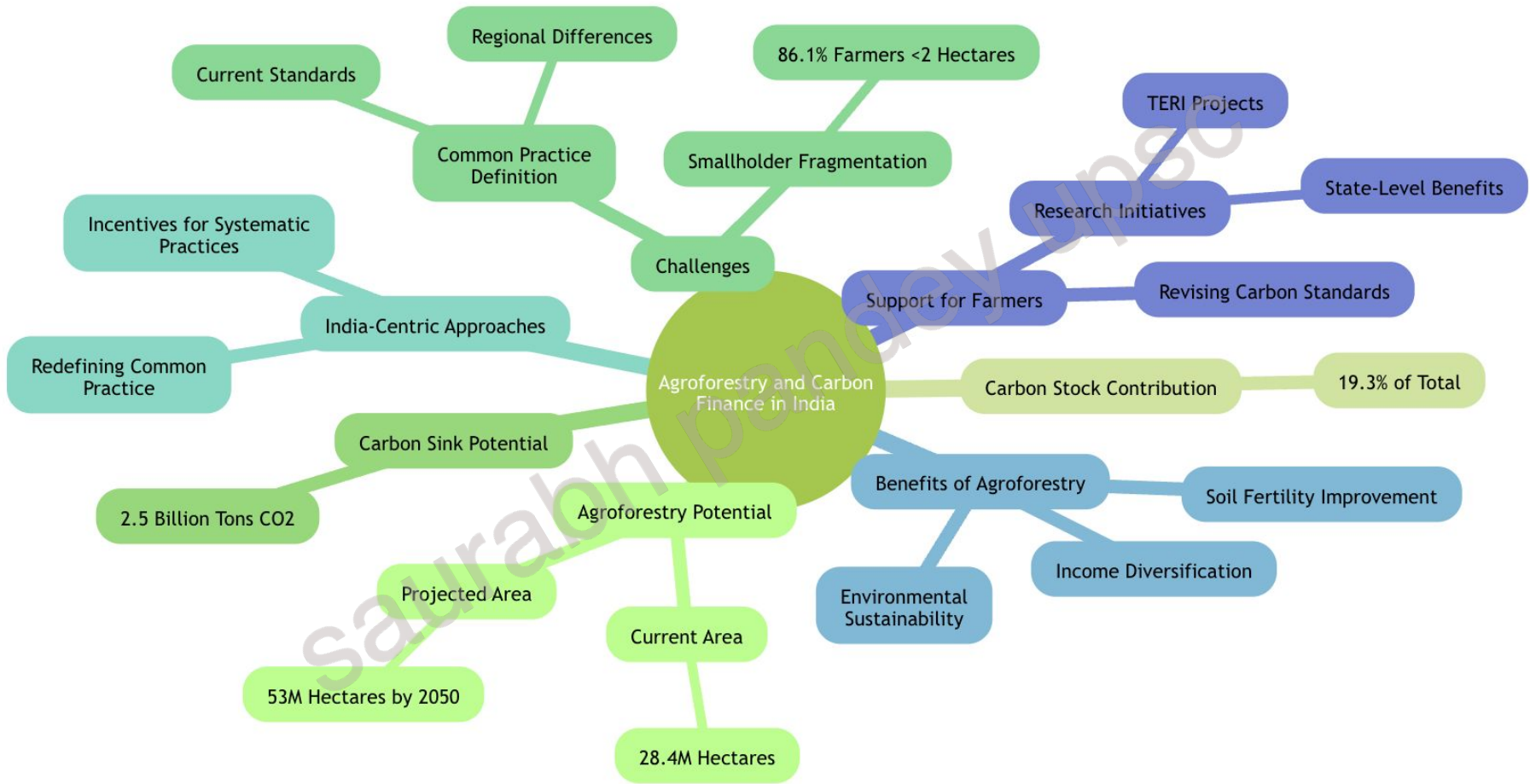
## Conclusion

Evolving international standards to reflect India's agricultural conditions

Driving sustainable development and boosting rural incomes

Paving the way for a greener, economically prosperous future for farmers 🚀





## Global Governance and Future Directions

Key Questions on Global Governance

Great Power Competition vs. Global Inequality 

Debate on the Meaning of Justice

Global Initiatives

Global Digital Impact Initiative 

Declaration on Future Generations 

International Scientific Panel and Global Dialogue on AI 

Impact of Climate Change

Historical Context: 30 years of Climate Change on Global

Agenda 

Scaling Up Adaptation Finance 

Inclusion of Sustainability in GDP 



## Institutional Imbalances

G-7's Role and Historical Context 🏛️

Anti-developing Country Body

Colonial Legacy vs. Current Dynamics

Sustainable Development Goals (SDGs) Progress 📊

Only 17% on Track

Developing Countries' Debt Crisis 💰



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## Emergence of New Powers

Rise of BRICS and Shift in Global Power 

Asia's Resource Consumption Trends 

Increasing Voice of Global South but Limited Agenda Setting

## Future of Global Governance

Need for Security Council Reform 

Greater Say for Developing Countries in Financial Institutions 

Framing of Global Issues by Experts 

## Prosperity Beyond GDP

Non-Monetary Factors in Prosperity 

Infrastructure, Education, Health, and Well-being Metrics

## Opportunities for Developing Countries

Exploiting Opportunities within the UN System 

Involvement in Global AI Governance and GDP Modifications

## Geopolitical Dynamics

Divergent Views on Society and Change between Asia and the West



# Topic→Why Flood in Nepal?

## Background

**Heavy Rainfall:** Continuous rain leading to saturated soil.

**Geography:** Nepal's mountainous terrain exacerbates flooding.

## Causes of Flooding

**Monsoon Season:** Seasonal heavy rains are common.

**Climate Change:** Increased rainfall intensity and frequency.

**Deforestation:** Loss of vegetation leading to soil erosion.

**Urbanization:** Poor drainage systems in urban areas.



Casualties: At least 170 deaths reported.

Displacement: Thousands displaced from their homes.

Infrastructure Damage: Roads, bridges, and buildings destroyed.

Economic Loss: Disruption of local economies and livelihoods.

## Response Measures

Emergency Services: Deployment of rescue teams and aid.

Government Actions: Closure of schools and evacuation orders.

International Aid: Support from NGOs and foreign governments.





## Future Considerations

Disaster Preparedness: Improved infrastructure and response plans.

Environmental Policies: Reforestation and sustainable practices.

Community Awareness: Educating locals on flood risks and safety.



# TOPIC->Supreme Court Ruling Regarding the POCSO Act

## Overview of the Ruling

### Key Points:

- Viewing, downloading, and storing child sexual material is punishable.
- Clarification of offenses under the Protection of Sexual Offences Against Children (POCSO) Act.
- Criminal liability extends beyond just creating or transmitting material.

### Ruling Details:

- The Supreme Court held the previous High Court decision was erroneous.
- Section 15 of POCSO amended in 2019 to include:
  - Section 15(1): Failure to delete or report child pornographic material.
  - Section 15(2): Transmitting or distributing child pornography.
  - Third Limb: Punishes possession for commercial purposes.



---

## Concept of Constructive Possession:

### Definition:

Extends possession beyond physical control.

Involves the power and intention to control child pornography material.

### Implications:

Viewing, distributing, or displaying child pornographic material is considered possession.



## Overview of Sea Robins

Habitat: Bottom-dwelling lifestyle

Unique Features: Six leg-like appendages

Behavior: Scurrying, digging, and finding prey

Adaptations: Extensions of pectoral fins

🐟 Sea Robins: Fish adapted for bottom-dwelling life.

🦶 Leg-like Appendages: Six appendages for scurrying and digging.

👁️ Sensory Adaptation: Use legs to find prey without visual cues



# Topic → Impact of Dead Coral Skeletons on Reef Recovery

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## Overview of the Issue

**Coral Bleaching:** A significant environmental event leading to coral death.

**Dead Coral Skeletons:** Left behind, causing critical processes to break down.

**Seaweed Dominance:** Complex landscape protects seaweed from herbivores.

**Macroalgae Competition:** Competes with coral for space, light, and resources.

**Balancing Effect of Herbivory:** Essential to prevent macroalgae overgrowth.

## Key Points

**Coral Recovery:** Hindered by existing dead skeletons.

**Herbivory:** Necessary to balance macroalgae growth and coral regeneration.

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# Topic→Embryonic Diapause in Mammals



## Overview

Embryonic Diapause: A mechanism that alters the timing of embryonic development.

Purpose: Increases chances of survival for both embryos and mothers.

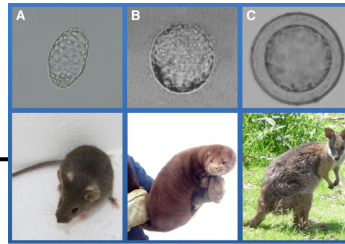
Key Stage: Often occurs at the blastocyst stage before implantation.

Duration: Can be maintained for weeks or months.

## Molecular Mechanisms

Actionable in Humans: Potential insights into human embryonic development.

Control Factors: Intrinsic and extrinsic factors influencing the timing of gestation.



## Topic→Pigs and Rat Hepatitis E Virus Transmission

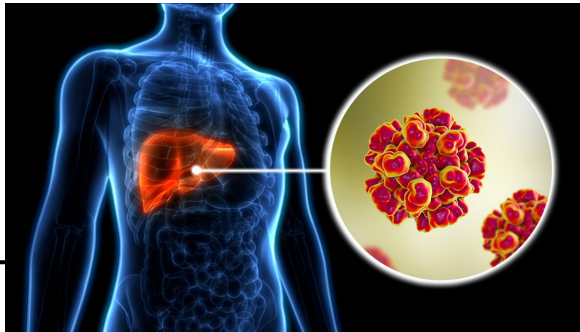
### Overview

Rat HEV: A strain of hepatitis E virus primarily found in rats.

Transmission: Pigs may act as a bridge for the virus to infect humans.

First Case: Reported in 2018 in Hong Kong.

Research indicates that pigs could transmit the rat HEV strain to humans, potentially through consumption of raw pork or fecal-oral routes.



## Key Points

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Human Cases: Over 20 reported, some with normal immune function.

Undetermined Cause: Infections without reported rat exposure.

Research Findings:

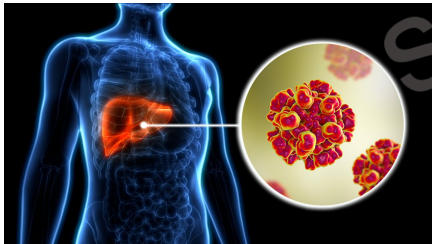
Cloned virus from human strains infects pigs.

Transmitted among pigs in co-housed environments.

## Implications

Pork Industry Risks: Pigs in swine barns can be exposed to rats.

Public Health: Hepatitis E is a major cause of acute liver infections worldwide, particularly in areas with poor sanitation.





# Why Kerala has to revisit its **antibiotics policy**

Sale of antibiotics through hospitals and medical stores across Kerala reduced by ₹1,000 crore in the last one year

**1** Kerala has enforced the Indian government's H1 rule of 2011 to prohibit OTC sale of all classes of antibiotics without a prescription

**2** In 2013, India tweaked the rule to allow first-line antibiotics to be sold over-the-counter without a prescription

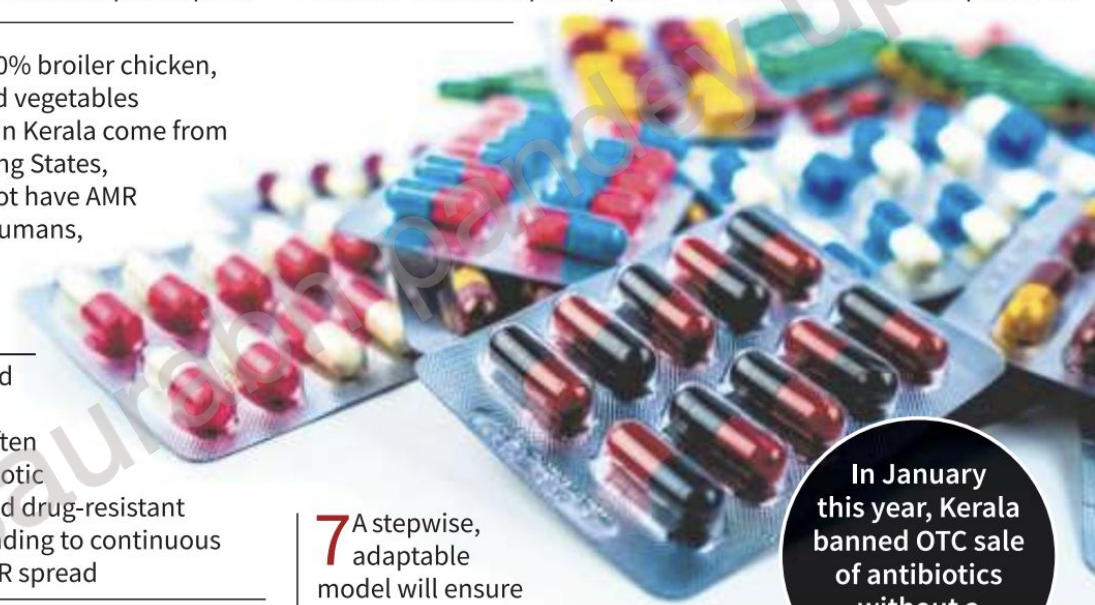
**3** The 2011 rule was modified as it would have restricted the access to even the first-line medicines in remote places too

**4** About 60% broiler chicken, eggs and vegetables consumed in Kerala come from neighbouring States, which do not have AMR policy for humans, animals and agriculture

**5** Imported food products often carry antibiotic residues and drug-resistant bacteria leading to continuous cycle of AMR spread

**6** By enforcing the modified H1 rule of 2013, Kerala can get the neighbouring States too on board

**7** A stepwise, adaptable model will ensure that Kerala's efforts to combat AMR does not go in vain



In January this year, Kerala banned OTC sale of antibiotics without a prescription

## Overview

Geological History: 

Arabian Sea incursions (150-200 million years ago)

Geological upheavals creating landmass

Isolation of Kutch basin

Location: 

Little Rann of Kutch

Area: 5,000 sq. km

Surendranagar district, Gujarat

Seasonal Changes: 

Barren salt flats for most of the year

Transformation into shallow wetland during monsoon



## Wildlife of the Rann

Indian Wild Ass (Khur):

Unique habitat of the wild ass sanctuary

Population: ~6,000

Adaptations: xerophytic vegetation, sustenance in arid environments

Behavior & Reproduction:

Size similar to a zebra, lifespan of 21 years

Stable groups of females and young, stallions as loners

Capable of running up to 70 km/h



## Near-Extinction Recovery:

Overcoming diseases (African Horse sickness, Surra)

Genetic bottleneck concerns

Upward trend due to conservation

## Human Conflicts:

Salt farming impacts (30% of India's salt)

Seasonal migration of families (5,000 families)

Grazing and irrigation canals affecting ecosystem



## Challenges to Wildlife 🐾

Human Encroachment:

Heavy vehicular traffic

Increased salinity from irrigation

Crop raiding reputation

Management Needs:

Separation of sanctuary from human-dominated areas

Sustainable practices for coexistence



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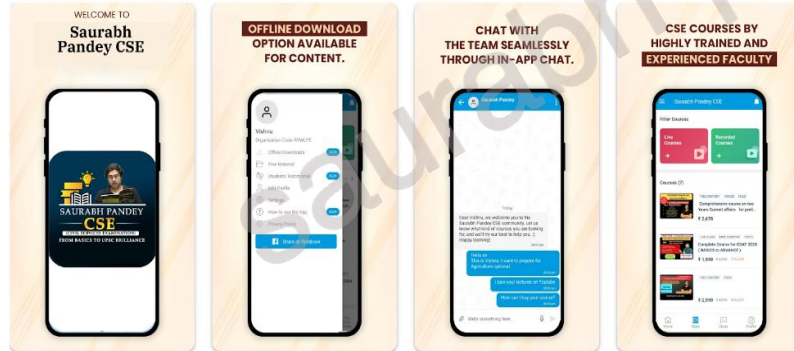
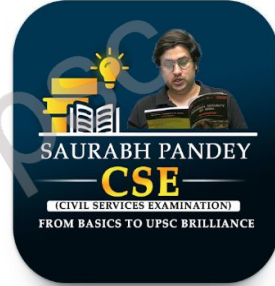
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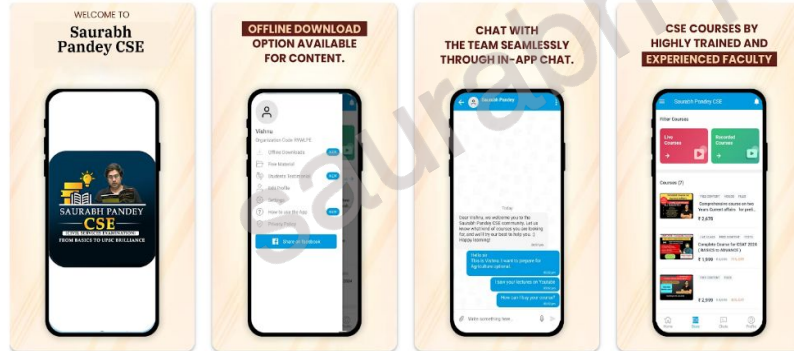
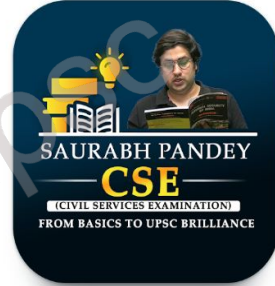
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