DAILY CURRENT AFFAIRS 31-10-2025

GS-1

1. **Hurricane Melissa**

GS-3

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4. **Malabar Gliding Frog**
5. **Rakchham-Chitkul Wildlife Sanctuary**

Hurricane Melissa

Syllabus: GS-1: Physical Geography – Cyclones.

Context:

- **Hurricane Melissa** is a **Category 5 tropical cyclone**, the **strongest hurricane in Jamaica's recorded history**, surpassing **Hurricane Gilbert (1988)**.
- It formed over the **Caribbean Sea** and struck Jamaica with **wind speeds up to 185 mph (295 km/h)** before moving toward **Cuba's Santiago province**.

Origin and Formation Process

Stage	Description
Trigger	A **low-pressure disturbance** developed over the **central Caribbean Sea**.
Intensification	Unusually **warm sea surface temperatures (~30°C)** and **high atmospheric humidity** fueled **rapid intensification**.
Trajectory	Initially moved **westward across Jamaica**, then curved **northeast toward Cuba and the Bahamas**.
Peak Strength	Reached **Category 5** on the **Saffir–Simpson Hurricane Wind Scale (SSHWS)**.

Impact on Jamaica

- **Winds:** Up to 185 mph (295 km/h).
- **Casualties and Displacement:** Over **1.5 million displaced** people.
- **Agriculture:** Massive crop losses, especially **banana, sugarcane, and coffee plantations**.
- **Infrastructure:** Severe **damage to roads, power grids, housing**, and **water systems**.
- **Environment:** Coastal erosion, coral reef damage, and flooding.

About the Saffir–Simpson Hurricane Wind Scale (SSHWS)

Category	Wind Speed (mph)	Damage Potential
1	74–95	Minor damage to roofs, trees; brief power cuts.
2	96–110	Major roof damage; power outages for days–weeks.
3 (Major)	111–129	Devastating structural damage; prolonged power/water outages.
4 (Major)	130–156	Catastrophic damage; areas may be uninhabitable for weeks.
5 (Major)	≥157	Near-total destruction; long-term displacement and infrastructural collapse.

Note: The SSHWS classifies hurricanes **only by wind speed**, not by **rainfall or storm surge**, which can also be deadly.

Broader Significance

- **Climate Change Link:** Intensification of hurricanes like Melissa is linked to **warming oceans** and **increasing atmospheric moisture**.
- **Regional Preparedness:** Highlights the urgent need for **Caribbean disaster resilience**, **early warning systems**, and **climate adaptation infrastructure**.

New Development Bank (NDB)

Syllabus: GS-3; International Economic Institutions

Context

- **Pakistan has sought China's support** to become a member of the **New Development Bank (NDB)**, also known as the **BRICS Bank**.

About the New Development Bank (NDB)

- **Former Name:** BRICS Development Bank
- **Established by:** Brazil, Russia, India, China, and South Africa (BRICS)
- **Objective:** To mobilize resources for infrastructure and sustainable development in BRICS countries and other emerging economies.

Headquarters and Membership

- **Headquarters:** Shanghai, China
- **Regional Offices:** South Africa and Brazil
- **Membership:** Open to all members of the **United Nations**
    - So far, **Bangladesh, UAE, Egypt, and Uruguay** have joined as new members beyond BRICS.

Capital Structure

- **Authorized Capital:** USD 100 billion
- **Subscribed Capital:** USD 50 billion (equally shared by BRICS founders)
- **Voting Power:** Equal for all founding members — unlike the **World Bank** or **Asian Development Bank (ADB)** where voting depends on capital contribution.

Key Sectors of Operation

- Clean energy and energy efficiency
- Transport infrastructure
- Water and sanitation
- Environmental protection
- Social and digital infrastructure

Governance

- **Board of Governors:** Finance Ministers of BRICS nations
- **Board of Directors:** Oversees operational matters
- **Presidency and Vice-Presidency:** Rotated among the five founding members

MAM01 Monoclonal Antibody

Syllabus: GS-3; Science & Technology

Context

- A **novel monoclonal antibody named MAM01**, developed by **US researchers**, has shown **strong protection against malaria** in an early-stage clinical trial.

About MAM01

- **Purpose:** Designed to prevent *malaria infection* caused by *Plasmodium falciparum*.
- **Mechanism:** Targets a **highly conserved region** of the *circumsporozoite protein* on the parasite's surface, **blocking infection before the parasite reaches the bloodstream**.
- **Trial Outcome:** Demonstrated **dose-dependent, full protection** against the malaria parasite with **minimal side effects**.

Key Features

- **Administration:** Single injection providing **immediate and months-long protection**.
- **Benefit:** Especially useful for **young children and pregnant women** in *malaria-endemic regions*.
- **Advantage:** Offers an alternative to repeated vaccination or preventive drug doses.

What are Monoclonal Antibodies (mAbs)?

- **Definition:** Laboratory-made **proteins that mimic the immune system's natural antibodies**.
- **"Monoclonal" means:** Derived from a **single cloned B-cell**, producing identical antibody copies.
- **Production:** Involves cloning a B cell that produces a desired antibody, then culturing it to generate large amounts.
- **Specificity:** They **bind precisely to one antigen**, minimizing off-target effects.
- **Applications:**
    - **Infectious diseases:** e.g., COVID-19, malaria.
    - **Cancer treatment:** e.g., Rituximab, Trastuzumab.
    - **Autoimmune disorders:** e.g., Infliximab for rheumatoid arthritis.

Significance

- Represents a **major advancement in malaria prevention**, potentially complementing or substituting vaccines in high-risk populations.
- Could play a pivotal role in **global malaria eradication strategies**, especially in regions with high transmission and low vaccine access.

Malabar Gliding Frog

Syllabus: GS-3; Biodiversity

Context

- A rare species known as the **Malabar Gliding Frog** (*Rhacophorus malabaricus*) was recently sighted at **Hirebagewadi near Belagavi, Karnataka**.
- This sighting is significant as it highlights the rich biodiversity of the Western Ghats and the continued presence of this endemic species outside its usual rainforest habitat.

About Malabar Gliding Frog

- **Scientific Name:** *Rhacophorus malabaricus*.
- **Common Names:** Malabar Gliding Frog, Malabar Flying Frog

Habitat and Distribution

- **Endemic Region:** Western Ghats of India
- **Preferred Habitat:** Rainforests, tree canopies near streams and riverbanks.
- During the **breeding season**, these frogs migrate to trees overhanging water bodies, where they lay eggs in foam nests. The **tadpoles drop into the water** after hatching.

Unique Adaptation: Gliding Ability

- Known for its **remarkable gliding ability**, this frog can leap from tree to tree, **covering distances of up to 9–12 metres** (about 30–40 feet).
- It uses the **webbing between its toes** like a parachute, enabling controlled descent — an adaptation that helps it escape predators and move efficiently in dense canopies.

Physical Features

- **Size:** Up to 10 cm (4 inches), making it one of the **largest moss frogs** in Asia.
- **Color:** Bright green dorsal skin with a pale yellow underside.
- **Texture:** Back is finely granulated, while the belly feels rough.
- **Distinctive Feature:** Large **orange-red webbing** between fingers and toes.
- **Sexual Dimorphism:** Males are smaller than females.

Conservation Status

- **IUCN Red List:** *Least Concern*
- Although not currently threatened, its **habitat is under pressure** from deforestation, urban expansion, and pollution in the Western Ghats.

Rakchham-Chitkul Wildlife Sanctuary

Syllabus: GS-3; Biodiversity

Context

- **An international bird-watching programme** was recently held at the **Rakchham area** of the **Rakchham-Chitkul Wildlife Sanctuary**, Himachal Pradesh.

About Rakchham-Chitkul Wildlife Sanctuary

- **Location:** Kinnaur district, Himachal Pradesh
- **Area:** 30.98 sq. km
- **Altitude:** 3,200–5,486 metres above sea level
- **Mountain Range:** Western Himalayas
- **Terrain & Climate:**
    - Lies in a **dry temperate zone**, unlike most other sanctuaries in Himachal Pradesh.
    - Does **not experience monsoon rains** due to its rain-shadow location.

Flora

- Dominant vegetation includes:
    - **Rhododendrons**, **oak**, and **pine** trees
    - Rich in **medicinal herbs** typical of high-altitude Himalayan ecosystems

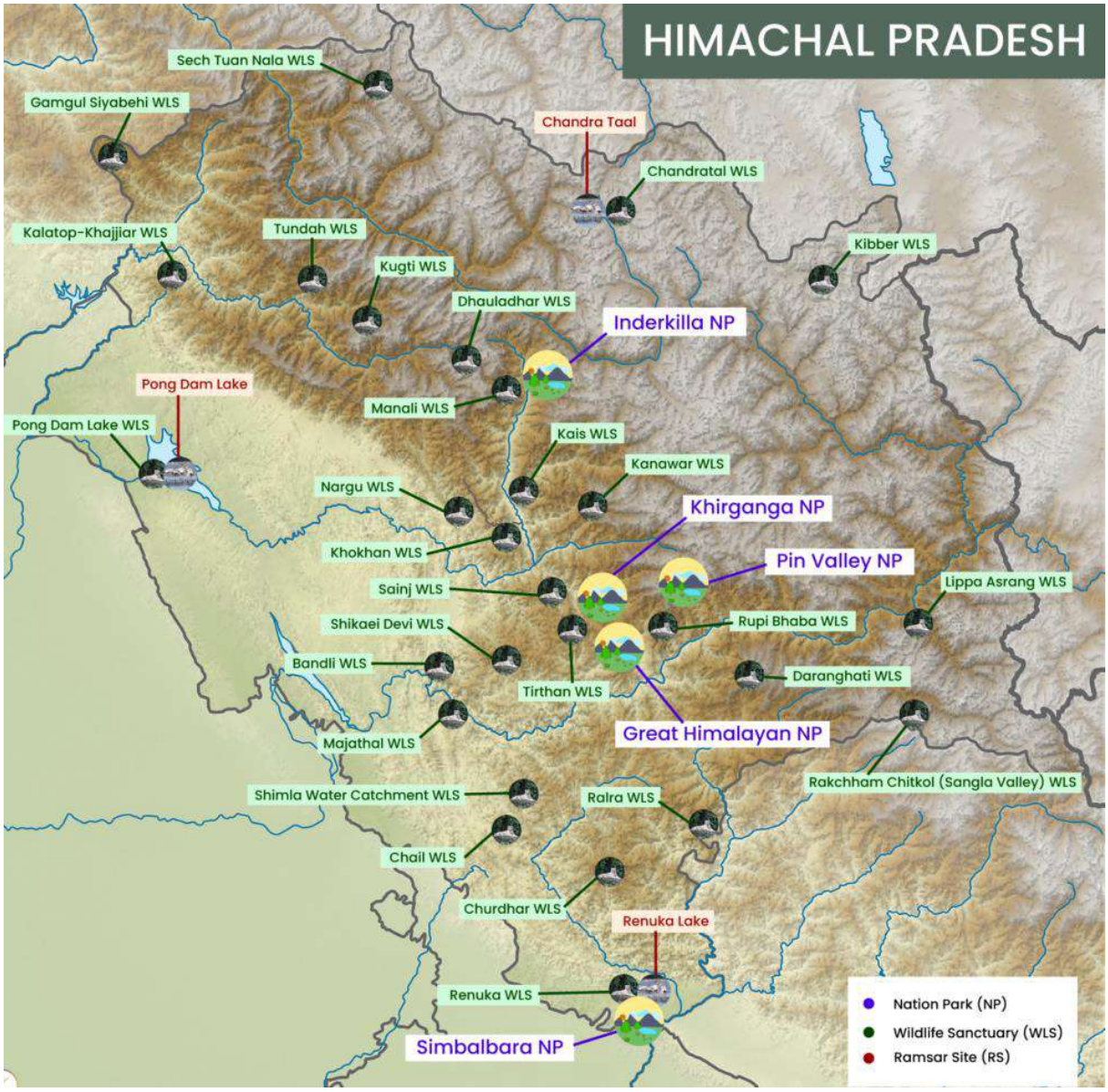
Fauna

- Home to rare and endangered species like:
    - **Snow Leopard**
    - **Himalayan Black Bear**
    - **Musk Deer**
    - Several **Himalayan bird species** (notably observed during the recent bird-watching programme)

Notable Features

- The **Lamkhanga Pass** trekking route passes through the sanctuary.
- This pass **connects Kinnaur (Himachal Pradesh)** with the **Gangotri region (Uttarakhand)**.
- Surrounded by **snow-capped mountains**, **lush valleys**, and **gushing rivers**, it offers a pristine Himalayan landscape ideal for eco-tourism and research.

Know more


HIMACHAL PRADESH
Sech Tuan Nala WLS
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Chandra Taal
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Tundah WLS
Kugti WLS
Kibber WLS
Dhauladhar WLS
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Manali WLS
Pong Dam Lake WLS
Kais WLS
Kanawar WLS
Nargu WLS
Khirganga NP
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Pin Valley NP
Sainj WLS
Lippa Asrang WLS
Shikaei Devi WLS
Rupi Bhaba WLS
Bandli WLS
Tirthan WLS
Daranghati WLS
Great Himalayan NP
Majathal WLS
Rakchham Chitkol (Sangla Valley) WLS
Shimla Water Catchment WLS
Raira WLS
Chail WLS
Churdhar WLS
Renuka Lake
Renuka WLS
Simbalbara NP
Nation Park (NP)
Wildlife Sanctuary (WLS)
Ramsar Site (RS)