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## Andaman & Nicobar Islands' Rich Faunal Diversity

A recent publication by the Zoological Survey of India (ZSI) titled **Faunal Diversity of Biogeographic Zones: Islands of India**, has for the first time come up with a database of all faunal species found on the Andaman and Nicobar (A&N) islands.

- According to the publication, A&N islands which comprise only **0.25% of India's geographical area**, are home to more than **10% of the country's fauna species**.
- The presence of a large number of species in such a small area makes the A&N islands one of the richest ecosystems and biodiversity hotspots in India.
- A long period of isolation from the mainland made the islands hotspots for speciation (the formation of new and distinct species) resulting in hundreds of endemic species and subspecies.

### Zoological Survey of India

- The Zoological Survey of India (ZSI), a subordinate organization of the **Ministry of Environment and Forests** was **established in 1916**.
- It is a national centre for **faunistic survey** and exploration of the resources leading to the **advancement of knowledge** on the exceptionally **rich faunal diversity of the country**.
- It has its headquarters at **Kolkata** and 16 regional stations located in different geographic locations of the country.

### Faunal Diversity

- Major **endemic faunal species** found only on the A&N Islands and nowhere else are **Narcondam hornbill**, **Nicobar megapode** (a bird that builds nests on the ground); **Nicobar treeshrew** (a small mole-like mammal), **Long-tailed Nicobar macaque**, and the **Andaman day gecko**.

- Among **marine fauna** found on the islands, the **Dugong (sea cow)**, and the **Indo-Pacific humpback dolphin** are classified as **Vulnerable** under the **IUCN** (International Union for Conservation of Nature) Red List of Threatened Species.
- Among the **terrestrial mammalian species** found, three species have been categorised as **Critically Endangered** under **IUCN Red List** — **Andaman shrew** (*Crocidura andamanensis*), **Jenkin's shrew** (*C. jenkinsi*) and **Nicobar shrew** (*C. nicobarica*).
- Another unique feature of the islands' ecosystem is its **marine faunal diversity**, which includes **coral reefs** and its associated fauna.
- **More than 500 species of scleractinian corals** (hard or stony corals) are found in the island ecosystem which have been protected under **Schedule I of the Wildlife Protection Act, 1972**.

## Key Findings: Causes & Consequences

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- Anthropogenic threats-**tourism, illegal construction** and **mining** are posing a threat to the islands' biodiversity, which is already vulnerable to **volatile climatic factors**.
- The development paradigm that is being pushed such as tourism, construction and development of military, is not taking in account three factors — **ecological fragility** of the area (the endemism), **geological volatility** (earthquakes and tsunamis), and the **impact they will have on local communities**.
- Any stress can have a long-lasting impact on the A&N islands' biodiversity, devastating the population size of any endemic fauna, followed by extinction within a limited span of time.

### Andaman and Nicobar Islands

- The Andaman and Nicobar islands ( A&N islands), popularly known as '**Bay Islands**', are situated in the Bay of Bengal, midway between peninsular India and Myanmar, spreading like a broken necklace in the North-south direction.
- The total geographic area of A&N islands is 8249 sq km, of which Andaman group of islands cover 6408 sq km while Nicobar group cover 1841 sq km.
- A&N islands represent a **typical tropical ecosystem** that includes an endless stretch of **tropical rainforests** bordered by **mangrove swamps** and unspoilt fragile marine biota exhibiting an extreme degree of endemism.
- The **maximum altitude** of these islands is 730 m at **Saddle Peak** in **North Andaman**, formed mainly of **limestone, sandstone, and clay**.
- Two islands of **volcanic origin** are found, namely the **Narcondam** and the **Barren islands**. The former is now apparently extinct while the **latter is still active**.
- The Andaman and Nicobars are separated by the **Ten Degree Channel** which is 150 Kms. wide.

- The population of the islands is about 4 lakh, which includes **six particularly vulnerable tribal groups (PVTGs)**.
- The indigenous people of **Andamans** are the **Great Andamanese**, the **Jarawa**; the **Onge**; and the **Sentinelese (the most isolated of all the groups)**.
- The indigenous peoples of the **Nicobars** (unrelated to the Andamanese) are the **Nicobarese**; and the **Shompen**.
- The **Andaman Wood Pigeon**, **Andaman Padauk** and **Dugong** are declared as **State Bird**, **State Tree** and **State Animal** respectively.

## Biodiversity Hotspots of India

There are **four biodiversity hotspots** in India:

- **Himalaya**: Includes the **entire Indian Himalayan region** (and that falling in Pakistan, Tibet, Nepal, Bhutan, China and Myanmar)
- **Indo-Burma**: Includes **entire North-eastern India, except Assam and Andaman group of Islands** (and Myanmar, Thailand, Vietnam, Laos, Cambodia and southern China)
- **Sundalands**: Includes **Nicobar group of Islands** (and Indonesia, Malaysia, Singapore, Brunei, Philippines)
- **Western Ghats and Sri Lanka**: Includes **entire Western Ghats** (and Sri Lanka)

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## RIMES Terms Titli Cyclone 'Rarest of Rare'

- The Regional Integrated Multi-Hazard Early Warning System (**RIMES**) for Africa and Asia, has termed '**Titli**', the severe cyclonic storm that hit Odisha as '**rarest cyclone**'.
- Titli cyclone was the rarest of rare in terms of its following characteristics:
  - **Recurvature** after landfall.
    - When the **eye of the storm passes over land**, it is classified as making landfall.
    - The eye of a hurricane has **comparatively light winds and mild weather**, while the eyewall is a ring of thunderstorms surrounding the eye.
    - The eyewall can actually **hit land without the cyclone "making landfall"**.  
E.g.: Hurricane Sandy made landfall in Cuba and Jamaica, but it was Haiti that was hit hardest.
  - Retaining its **destructive potential after landfall**,
  - **Recurvature away from the coastal areas** for more than two days,
  - **No synthetic track projection** available to capture the Titli type of cyclones,
  - Damage to both life and property caused in **interior districts**.
- Earlier, India Meteorological Department had also called the formation of Titli as a 'rarest of rare' occurrence.

- Usually, cyclone-risk management are **heavily focused on the coastal areas** where cyclones cross at their peak intensities. Therefore, coastal areas now have been largely well managed through evacuations and other protocols, leading to zero casualties. However, this is not true for the interior regions since a Cyclone's intensity weakens as it moves away from coastal areas.
- The RIMES has recommended that a **detailed risk assessment** be carried out for Odisha to understand the risks in the light of the Titli devastation.

## Movement of Cyclone

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- The cyclones that typically strike the Indian neighbourhood in the northern hemisphere **rotate anticlockwise**.
- Their normal behaviour is to **derive strength from the moisture in waters** such as the Bay of Bengal, move west, incline in a northerly direction and peter out into the sea or land, depending on their origin.
- In a re-curving cyclone, the cyclone gets a sort of second wind when it is on the wane.
- It is **deflected right or eastwards**. This is due to **air currents in the local atmosphere that push cold air from the poles** towards the equator and interfere with cyclone formation. That is what make them 're-curving.'
- In the southern hemisphere, the **cyclones spin clockwise and therefore also re-curve in the opposite direction**.
- A challenge with re-curving cyclones is that **it is hard for weather models to pick them early on** — as was the case with Ockhi — and so they pose unique challenges in terms of hazard preparedness and disaster management.

## Regional Integrated Multi-Hazard Early Warning System (RIMES)

- RIMES is an **international and intergovernmental institution**, owned and managed by its Member States, for the generation and application of early warning information.
- It was established after the aftermath of the 2004 Indian Ocean tsunami **on 30 April 2009**, and was **registered with the United Nations on 1 July 2009**.
- RIMES operates from its regional early warning center located at the campus of the Asian Institute of Technology in Pathumthani, **Thailand**.
- It is owned and managed by a **Council** comprising of 48 Members and Collaborating States. Currently, the **Government of India serves as RIMES Council Chair**.

[Read more about Cyclones](#)

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## Intensified Mission Indradhanush Best Practice in the World: BMJ

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Intensified Mission Indradhanush (IMI) is listed as one of 12 best practices from around the

world and will be featured in a special issue of the British Medical Journal (BMJ).

The special issue will be brought out on the occasion of the fourth Partners Forum conference organised by the Government of India in New Delhi.

### **Partners' Forum is short for the meeting of The Partnership for Maternal, Newborn & Child Health (The Partnership, PMNCH).**

- The Partnership, PMNCH is an **alliance of more than 1,000 organisations in 192 countries**. The organisations work in the sexual, reproductive, maternal, newborn, child and adolescent health communities, as well as health influencing sectors.
- The Partnership is governed by a Board, and administered by a Secretariat hosted at the **World Health Organization in Geneva, Switzerland**.

### **IMR and MMR data**

- India's infant mortality rate (IMR 2016) is **34 deaths per 1,000 live births**.
- India's maternal mortality rate (MMR 2016) is **130 per 100,000 live births**.

### **Universal Immunization Programme (UIP)**

- Launched by the **government in 1985**, UIP prevents mortality and morbidity in **children and pregnant women** against 12 vaccine preventable diseases.
- Under UIP free of cost vaccination is provided against twelve vaccine preventable diseases i.e. **Tuberculosis, Diphtheria, Pertussis, Tetanus, Polio, Hepatitis B, Pneumonia and Meningitis due to Haemophilus Influenzae type b (Hib), Measles, Rubella, Japanese Encephalitis (JE) and Rotavirus diarrhoea**.
- The programme was the one of largest health programme in the world. Despite being operational for many years, **UIP has been able to fully immunize only 65% children under 1 year of age**.

### **Mission Indradhanush**

- To give maximum protection to the children against Vaccine Preventable Diseases (VPDs). The government has launched 'Mission Indradhanush' in December 2014 to fully immunize more than 89 lakh children who are either unvaccinated or partially vaccinated under UIP.
- **The mission was launched in 2014 and targets children under 2 years of age and pregnant women for immunization.**
- Mission Indradhanush provides vaccination against **7 diseases diphtheria, whooping cough, tetanus, polio, tuberculosis, measles and hepatitis B**.
- In addition, **vaccination against Japanese Encephalitis and Haemophilus influenzae type B is being provided in selected districts of the country. Vaccination against tetanus is also provided to the pregnant women.**

- Mission Indradhanush aims to increase full immunization coverage in India to at least 90% children by December 2018.
- No separate funds are allocated for Mission Indradhanush. Funds allocated for Routine Immunization are being utilized by the states to carry out activities under Mission Indradhanush.
- Mission Indradhanush does not targets to reduce postnatal death rate but targets to reduce diseases and death due to vaccine preventable diseases.
- **Earlier the increase in full immunization coverage was 1% per year which has increased to 6.7% per year through the first two phases of 'Mission Indradhanush'.**

### **Intensified Mission Indradhanush**

- The **Intensified Mission Indradhanush (IMI) has been launched by government of India in 2017** to reach each and every child under two years of age and all those pregnant women who have been left uncovered under the routine immunisation programme.
- The target under IMI is to increase the full immunization coverage to 90% by December 2018.
- **Under Intensified Mission Indradhanush, greater focus was given on urban areas which was one of the gaps of Mission Indradhanush.**
- These areas have been selected through data available under national surveys, Health Management Information System data and World Health Organization concurrent monitoring data.

## **Important Facts for Prelims (26th November 2018)**

### **SSB to Patrol Dudhwa Tiger Reserve**

- **Dudhwa Tiger Reserve and Sashastra Seema Bal** have joined hands to provide security to Dudhwa forests and its rich wildlife.
- Apart from joint patrolling, intelligence and information sharing among various security agencies about activities of wildlife and forest criminals will also be undertaken.

### **Dudhwa Tiger Reserve**

- The Dudhwa Tiger Reserve is a protected area in **Uttar Pradesh** that stretches mainly across the **Lakhimpur Kheri and Bahraich districts.**
- It comprises of the **Dudhwa National Park, Kishanpur Wildlife Sanctuary and Katarniaghat Wildlife Sanctuary.**

- The **Sharda River flows by the Kishanpur WL Sanctuary**, the **Geruwa River flows through the Katerniaghat WL Sanctuary** and the **Suheli and Mohana streams flow in the Dudhwa National Park**, all of which are **tributaries of the Ghagra River**.
- The **northern boundary** of the park is being constituted by the **Mohana River** flowing along the Indo-Nepal border whilst the **southern boundary** is formed by the **river Suheli**.
- It includes three large forest fragments - marshes, grasslands and dense forests, amidst the matrix dominated by agriculture.

### Sashastra Seema Bal

- It was established as **Special Service Bureau in May 1963**, in the aftermath of the **Chinese aggression in 1962**.
- Sashastra Seema Bal came under aegis of the **Ministry of Home Affairs from 2001**.
- SSB was declared a Lead Intelligence Agency for Indo Nepal (June 2001) and assigned the **Indo Nepal border**. Later, SSB was also assigned **Indo Bhutan border** (March 2004).

### Vetiver Grass

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- Vetiver Grass (*Vetiveria zizanioides*) which has a wide range of applications is becoming popular in state of Tamil Nadu.
- Vetiver Grass commonly known as Khus grass is a perennial grass of Indian origin.
- **In India, there are two types of vetiver namely 'South Indian' and 'North Indian'.**
- Vetiver can be grown on almost every kind of soil. But, well drained sandy loam and red lateritic soils rich in organic matter are considered to be ideal for its cultivation.
- In India it is cultivated in the states of Rajasthan, Uttar Pradesh, Karnataka, TamilNadu, Kerala and Andhra Pradesh.
- Vetiver is indigenous to India, Pakistan, Bangladesh, Sri Lanka and Malaysia. Its main producers are Tropical Asia, Africa, Australia, Haiti, Indonesia, Guatemala, India, China and Brazil.
- The Vetiver System (VS), which is based on the application of vetiver grass, was first **introduced by the World Bank for soil and water conservation in India in the mid-1980s**.
- The Vetiver System (VS), used in more than 100 countries, is a system of soil and water conservation, whose main component is the use of the vetiver plant.

### Uses and Application of Vetiver Grass

- This grass helps in **combating soil erosion** especially on hilly slopes.
- It also **absorbs carbon dioxide**, thus erasing carbon footprints.
- The grass can be used to **purify polluted water bodies** through phyto-remediation.

- It has **moisture retention property**, which makes vetiver ideal for soil conservation and replenishment of ground-water.
- It is also used in **ethanol extraction, as cattle feed and for making handicrafts**. It is also an **antidepressant**.
- Roots of this grass **can be used to produce oil**, one kg of oil fetches between ₹30,000 and ₹58,000 to farmers.

## Saltwater crocodile sighted in AP

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- At least two saltwater crocodiles (*Crocodylus porosus*) were sighted in Andhra Pradesh Coast.
- Salt-water crocodiles are usually found around Odisha Coast. Their presence in Andhra indicates migration of the species from the Odisha coast.
- The two crocodiles will be shifted to the Bhitarkanika National Park (BNP), Odisha.
- **In India, the BNP, the Sundarbans and the Andaman & Nicobar Islands are the prime habitats of the saltwater crocodile.**

### Indian Crocodile Conservation Project

- Crocodilians were threatened in India due to indiscriminate killing for commercial purpose and severe habitat loss until enactment of the Wildlife (Protection) Act.1972.
- **Crocodile Conservation Project was launched in 1975 in different States.**
- The Gharial and Saltwater crocodile conservation programme was first implemented in Odisha in early 1975 and subsequently the Mugger conservation programme was initiated.
- The estimated number of the saltwater crocodiles increased from 96 in 1976 to 1,640 in 2012 in India due to rear and release programme established under the Indian Crocodile Conservation Project.

### Crocodiles in India

India has three species of crocodilians namely

- Gharial (*Gavialis gangeticus*) (IUCN: Critically Endangered)
- Mugger crocodile (*Crocodylus palustris*) (IUCN: Vulnerable)
- Saltwater crocodile (*Crocodylus porosus*) (IUCN: Least Concern)

### Bhitarkanika National Park

- **Bhitarkanika National Park is one of Odisha's** finest biodiversity hotspots and is famous for its green mangroves, migratory birds, turtles, estuarine crocodiles and countless creeks.
- The wetland is represented by 3 protected Areas, the Bhitarkanika National Park, the Bhitarkanika Wildlife Sanctuary and the Gahirmatha Marine Sanctuary.



- **Bhitarkanika is located in the estuary of Brahmani, Baitarani, Dhamra and Mahanadi river systems.**
- It is said to **house 70% of the country's estuarine or saltwater crocodiles.**

## United Nations Shortlists Noida, Greater Noida for 'Global Cities' Initiative

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- The United Nations officially invited Uttar Pradesh's Noida and Greater Noida to become a member of its **Global Sustainable Cities 2025 initiative** which aims to create 25 model cities across the world that will be fully compliant with the Sustainable Development Goals (SDGs) by 2025.
  - The twin-cities in Gautam Buddha Nagar district, have been selected in the **"University City"** category ahead of Mumbai and Bengaluru, which were also under UN consideration for the initiative, as the only invitee from India.
  - Cities are selected from each of the following **six categories: University, UN city, Medium (Approx. 500K population), Large (Approx. 1 million population), Mega(5 million+ population), Indigenous Communities.**
  - As part of this initiative, the UN will enter into an agreement with the city administration to **provide multi-million dollar funding** to work towards realising Sustainable Development Goals (SDGs). The UN will also sponsor the **PHDs of 51 students** in Noida who contribute to the programme via research.
  - Cities selected under the "University City" category will be judged on the basis of **how educated its population is, its economy, a high rate of entrepreneurship, and art and culture that "indicate a vibrant civil society"**.
  - The project is conducted by the **UN Global Sustainability Impact Institute (UNGSII)**. UNGSII was founded in May of 2014.
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