



## Mount Etna and Stromboli Eruption

[Source: TOI](#)

Recently, volcanic eruptions at [Mount Etna](#) and [Stromboli](#) in **Italy** have caused the eruption of hot **ash** and **lava** from it.

- **Mount Etna** is located on the island of **Sicily**, in the southern part of Italy.
  - It is the highest peak in Italy South of the Alps.
  - Europe's **most active volcano is also one of the largest volcanoes in the world.** Furthermore, it is the highest mountain on a Mediterranean island and the **most active stratovolcano globally.**
    - **Stratovolcanoes** are **tall, conical volcanoes** built up by **layers of hardened lava, ash, and rock** fragments.
    - They are typically found above **subduction zones**, and they are often part of **large volcanically active regions**, such as the **Ring of Fire** that frames much of the Pacific Ocean.
- **Stromboli (also a stratovolcano)** is a small island in the Tyrrhenian Sea, off the northern coast of Sicily, Italy.
  - It is one of the most continuously active volcanoes in the world, also known as "**Lighthouse of the Mediterranean.**"

//

# VOLCANOES

*A volcano is a vent or a fissure in the crust from which lava (molten rock), ash, gases, rock fragments erupt from a magma chamber below the surface*

- **Types: On basis of -**
  - **Periodicity of Eruption:**
    - **Active volcano:** Recently Erupted
    - **Dormant Volcano:** Potential for eruption, no imminent signs
    - **Extinct:** No recent eruptions, low possibility in future
  - **Nature of Eruption:**
    - **Hawaiian:** Calmest types (low gaseous content)
    - **Strombolian:** Formation of large gas bubbles in magma
    - **Vulcanian:** More explosive
    - **Plinian eruptions:** Magma's volatile gases rise via a narrow conduit
    - **Icelandic:** Often build lava plateaus
  - **Shape of Volcanoes:**
    - **Shield volcanoes:** Composed of basaltic lava, low slope
    - **Cone volcanoes (Cinder Cones):** Most abundant
    - **Composite cones (stratovolcanoes):** Formed by layers of diverse materials.
- **Volcanic Features:**
  - **Extrusive :**
    - **Crater:** Cone-shaped vent for magma
    - **Caldera:** Large, crater-like depression
    - **Volcanic Plateaus:** Leveled areas from fissure eruptions
  - **Intrusive:**
    - **Batholiths:** Central core of a volcanic mountain.
    - **Dyke:** Vertical intrusion cutting across country rock bedding.
    - **Sills:** Tabular intrusions along sedimentary bedding.
    - **Laccoliths:** Magma injection along horizontal sedimentary bedding.
  - **Minor:**
    - **Geysers:** Underground water above 100°C, powered by magma, results in powerful eruptions with steam and diluted minerals.
    - **Hot Springs:** Heated water flows quietly along fault zones.
- **Distribution of Volcanoes:**
  - **Subduction zones (Circum Pacific Belt)**
  - **Divergence zones (Mid Atlantic Ridge)**
  - **Intra-plate oceanic volcanism (Hawaiian chain)**
  - **Mid-continental belt and volcanoes in Mediterranean region**
- **Volcanoes in India:**
  - No volcanoes in Himalayans
  - Barren Island (Only active volcano)
- **Products of Volcanic Eruption:**
  - **Gases:** H, C, O, S, N, CH<sub>4</sub>, NH<sub>3</sub>
  - **Solid:** Pyroclastic materials
  - **Liquid:** Lava

Drishiti IAS

Read More: [Volcanism](#)

---

## World Zoonoses Day

**Source:** [PIB](#)

On the eve of [World Zoonoses Day](#), the **Department of Animal Husbandry and Dairying (DAHD)** organized an interactive session.

- It is celebrated in honour of [Louis Pasteur](#), who administered the **first successful rabies vaccine**, a zoonotic disease, on **6th July 1885**.
- **Zoonoses are infectious** diseases that can **transfer between animals and humans**, such as [rabies](#), [anthrax](#), [influenza \(H1N1 and H5N1\)](#), [Nipah](#), [Covid-19](#), [brucellosis](#), and [tuberculosis](#).
  - These diseases are caused by various **pathogens**, including [bacteria](#), [viruses](#), [parasites](#), and [fungi](#).
- Many **non-zoonotic diseases** affect livestock without posing a risk to human health.
  - Examples include [Foot & Mouth Disease](#), [Peste des Petits Ruminants \(PPR\)](#), [Lumpy Skin Disease](#), [Classical Swine Fever](#), and [Ranikhet Disease](#).
- **About 60% of all diseases are zoonotic**, and 70% of emerging infections originate from animals.
- Prevention and control of zoonotic diseases rely on vaccination, good hygiene, animal husbandry practices, and vector control through the [One Health approach](#).
- To mitigate the risk, the DAHD has launched a nationwide campaign for **Brucella vaccination of bovine calves** under [National Animal Disease Control Programme \(NADCP\)](#) and undertaken **Rabies Vaccination** under [Assistance to States for Control of Animal Diseases \(ASCAD\)](#).
- **India accounts 11% and 18% of the global livestock and poultry population**, respectively. Additionally, India is the **largest producer of milk and the second-largest producer of eggs globally**.

Read more: [World Zoonosis Day](#)

---

## UNESCO Designates 11 New Biosphere Reserves

**For Prelims:** [Biosphere Reserve](#), [United Nations Educational, Scientific and Cultural Organization \(UNESCO\)](#), [Biosphere Reserves in India](#), [Man and Biosphere Programme \(MAB\)](#).

**For Mains:** Biosphere Reserves: Criteria for Designation, Main Zones, Functions, International Status.

**Source:** [UNESCO](#)

### Why in News?

Recently, UNESCO has approved the designation of **11 new Biosphere Reserves (BR)** in 11 countries.

- The **World Network of Biosphere Reserves** thus now comprises **759 sites** across **136**

countries.

## What are the New Additions to the UNESCO Biosphere Reserve List?

- Kempen-Broek Transboundary Biosphere Reserve (Belgium, Kingdom of the Netherlands)
- Darién Norte Chocoano Biosphere Reserve (Colombia)
- Madre de las Aguas Biosphere Reserve (Dominican Republic)
- Niimi Biosphere Reserve (Gambia)
- Colli Euganei Biosphere Reserve (Italy)
- Julian Alps Transboundary Biosphere Reserve (Italy, Slovenia)
- Khar Us Lake Biosphere Reserve (Mongolia)
- Apayaos Biosphere Reserve (Philippines)
- Changnyeong Biosphere Reserve (Republic of Korea)
- Val d'Aran Biosphere Reserve (Spain)
- Irati Biosphere Reserve (Spain)

## What is a Biosphere Reserve?

### ▪ About:

- It is an international designation by the [United Nations Educational, Scientific and Cultural Organization \(UNESCO\)](#) for representative parts of **natural and cultural landscapes** extending over a large area of terrestrial or coastal/marine ecosystems or a combination of both.
- Biosphere Reserves tries to **balance economic and social development** and maintenance of associated cultural values along with the **preservation of nature**.
- These are special environments for both people and nature and are living examples of how **human beings and nature can co-exist while respecting each other's needs**.

### ▪ Criteria for Designation of BR:

- A site must contain a **protected and minimally disturbed core area** of value of nature conservation.
- The core area must be a **bio-geographical unit** and should be large enough to sustain a **viable population representing all trophic levels**.
- The **involvement of local communities** and use of their knowledge in biodiversity preservation.
- Area's potential for preservation of traditional tribal or rural modes of living for harmonious use of the environment.
- **Conservation:** Managing Biosphere Reserve's genetic resources, endemic species, ecosystems, and landscapes.
  - Along with the wildlife, culture and customs of tribals are also protected.
- **Development: Promoting economic and human growth that is sustainable on a sociocultural and ecological level.**

- It seeks to strengthen the 3 pillars of sustainable development which are social, economic and protection of the environment. **Functions of BR:**

### ◦ Logistic support:

- Promoting **research activities, environmental education, training and monitoring** in the context of local, national and international conservation and sustainable development.

## What is the Biosphere Reserve Project?

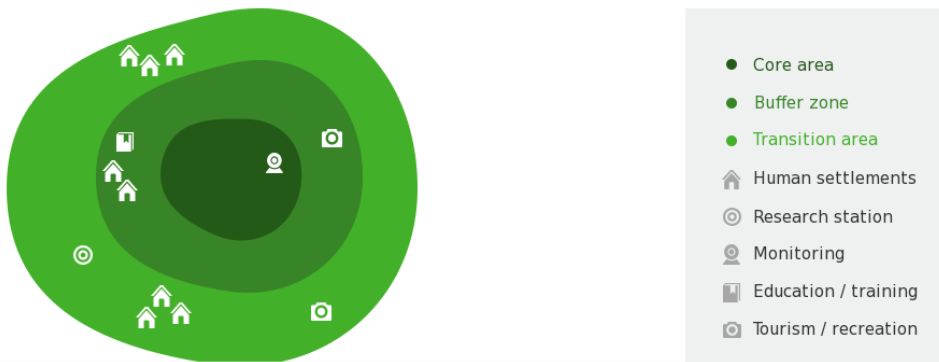
- The Government of India started the Biosphere Reserve scheme in **1986**.

- This is guided by the **UNESCO MAB programme**, as India is a signatory to the landscape approach supported by MAB.
- Under this scheme, **financial assistance** is provided in a **90:10 ratio to the North Eastern Region States and 3 Himalayan states**, and in a **60:40 ratio to other states** for the maintenance, improvement, and development of certain items within the biosphere reserves.
- The **State Government** prepares the **Management Action Plan** for the biosphere reserves, which is then approved and monitored by the Central MAB Committee.
- This scheme is implemented by the **Ministry of Environment, Forest and Climate Change**.

## What are the 3 Zones of Biosphere Reserve?

- **Core:**
  - It is the **most protected area** of a biosphere reserve. It may contain **endemic plants and animals**.
  - They conserve the **wild relatives of economic species** and also represent **important genetic reservoirs** having exceptional scientific interest.
  - A core zone is a **protected region**, like a **National Park or Sanctuary**/protected/regulated mostly under the [Wildlife \(Protection\) Act, 1972](#).
  - It is kept **free from human** interference.
- **Buffer Zone:**
  - It **surrounds the core zone**, and its activities are managed such that it help in the **protection of the core zone** in its natural condition.
  - It includes **restoration, limited tourism, fishing, grazing**, etc., which are permitted to reduce its effect on the core zone.
  - **Research and educational activities** are to be encouraged.

The three zones that characterise a Biosphere Reserve are



- **Transition Zone:**
  - It is the **outermost** part of the BR. It is the **zone of cooperation** where human ventures and conservation are done in harmony.
  - It includes **settlements, croplands, managed forests** and areas for intensive **recreation and other economic uses** characteristics of the region.

## What are the Biosphere Reserves in India?

- As of 2024, India has **18 notified biosphere reserves** in India (**12** recognized by UNESCO's MAB).

S.No.	Year of Notification	Name	State	Area (in Sq Km)	Is MAB Recognised ?
1	1986	Nilgiri Biosphere Reserve	Tamil Nadu (2537), Kerala (1455), Karnataka (1527)	5520	Yes
2	1988	Nanda Devi Biosphere	Uttarakhand	5860	Yes

		Reserve			
3	1988	Nokrek Biosphere Reserve	Meghalaya	820	Yes
4	1989	Gulf of Mannar Biosphere Reserve	Tamil Nadu	10500	Yes
5	1989	Sundarbans Biosphere Reserve	West Bengal	9630	Yes
6	1989	Manas Biosphere Reserve	Assam	2837	No
7	1989	Great Nicobar Biosphere Reserve	Andaman and Nicobar Islands	885	Yes
8	1994	Similipal Biosphere Reserve	Odisha	4374	Yes
9	1997	Dibru-Saikhowa Biosphere Reserve	Assam	765	No
10	1998	Dihang-Dibang Biosphere Reserve	Arunachal Pradesh	5112	No
11	1999	Pachmarhi Biosphere Reserve	Madhya Pradesh	4982	Yes
12	2000	Khangchendzonga Biosphere Reserve	Sikkim	2620	Yes
13	2001	Agasthyamalai Biosphere Reserve	Kerala, Tamil Nadu	3500	Yes
14	2005	Achanakmar-Amarkantak BR	Madhya Pradesh, Chhattisgarh	3835	Yes
15	2008	Great Rann of Kutch BR (Largest Area)	Gujarat	12454	No
16	2009	Cold Desert Biosphere Reserve	Himachal Pradesh	7770	No
17	2010	Seshachalam Hills Biosphere Reserve	Andhra Pradesh	4755	No
18	2011	Panna Biosphere Reserve	Madhya Pradesh	543	Yes

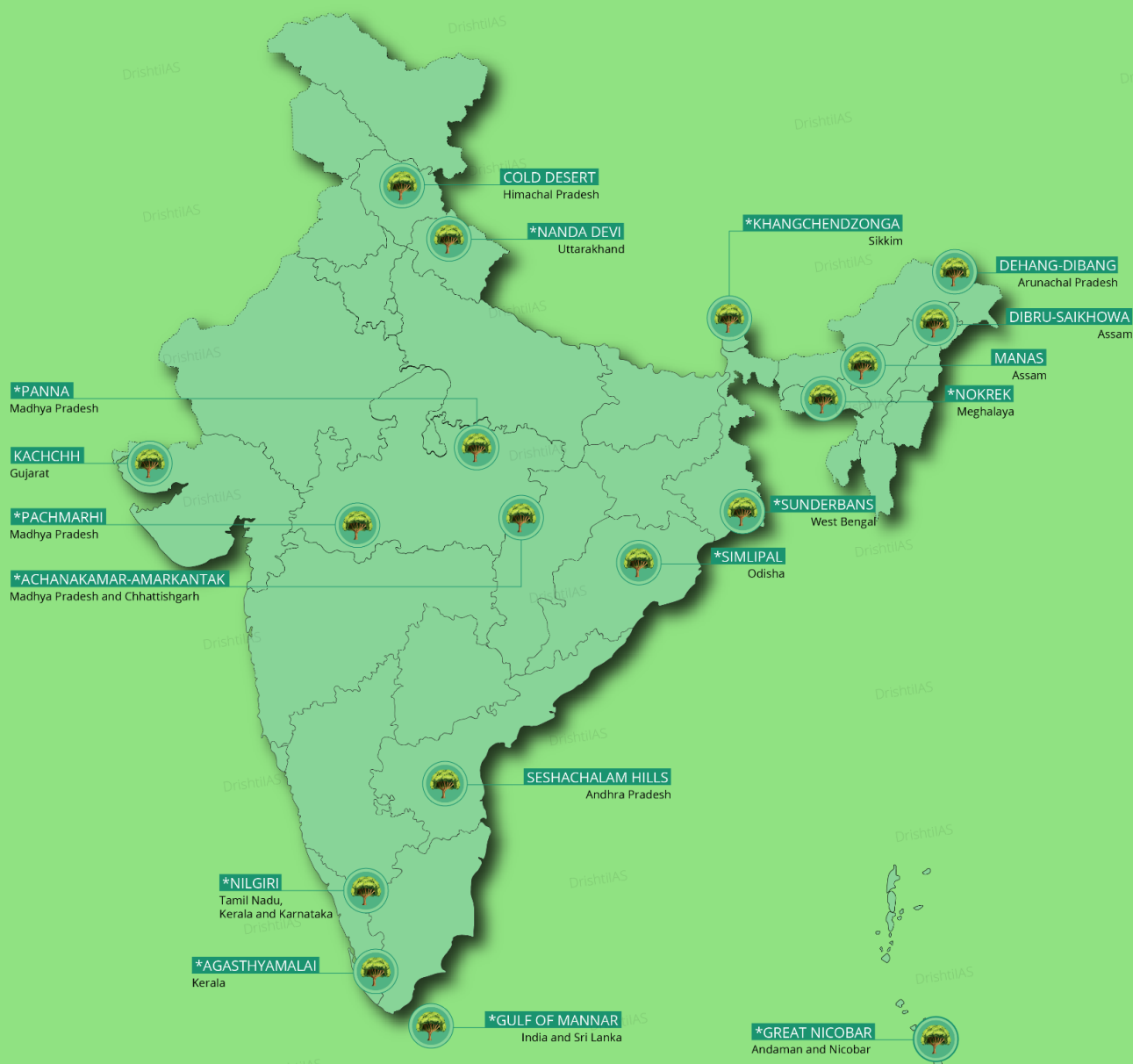
### What is the International Status of Biosphere Reserve?

- UNESCO has introduced the designation '**Biosphere Reserve**' for natural areas to minimise conflict between development and conservation.
- Biosphere Reserves are nominated by the national government which meets a minimal set of criteria under the **Man and Biosphere (MAB) Reserve Program** of UNESCO.
- Total number of **World Network of Biosphere Reserves** is **759** located in **136 countries** and covers a total of **7,442,000 square kilometers**.
- There are about **275 million people** living in biosphere reserves worldwide.
- There are a total **12 BR of India** recognized internationally under **MAB Reserve Programme**.

### Man and Biosphere Programme (MAB)

- It was initiated by **UNESCO** in **1971**.
- It is an **intergovernmental scientific programme** that aims to establish a scientific basis for the improvement of **relationships between people and their environments**.
- MAB integrates **natural and social sciences, economics, and education** to enhance human well-being, ensure fair distribution of benefits, and preserve natural and managed ecosystems.
- This **promotes creative and culturally suitable approaches to economic development** that are environmentally sustainable.

# Biosphere Reserves in India



## NOTE

- The idea of 'Biosphere Reserves' was initiated by UNESCO in 1973-74 under its Man and Biosphere (MAB) Programme.
- A scheme called Biosphere Reserve is being implemented by Government of India since 1986.
- India has 18 biospheres reserves, of which 12 have been included in the MAB Programme. Panna (Madhya Pradesh) was included in MAB in 2020.
- Mura-Drava-Danube (MDD) is the world's first 'five-country biosphere reserve' (Austria, Slovenia, Croatia, Hungary and Serbia).

\*World Network of Biosphere Reserve (MAB-UNESCO)

## **Drishiti Mains Question:**

What is a Biosphere Reserve? Critically examine the role of Biosphere Reserves in biodiversity conservation and sustainable development in India. Suggest measures to improve their effectiveness.

## UPSC Civil Services Examination, Previous Year's Question (PYQs)

### Prelims

**Q.1 Consider the following pairs: (2013)**

1. Nokrek Biosphere Reserve : Garo Hills
2. Logtak (Loktak) Lake : Barail Range
3. Namdapha National Park : Dafla Hills

**Which of the above pairs is/are correctly matched?**

- (a) 1 only
- (b) 2 and 3 only
- (c) 1, 2 and 3
- (d) None

**Ans: (a)**

**Q.2 The most important strategy for the conservation of biodiversity together with traditional human life is the establishment of (2014)**

- (a) biosphere reserves
- (b) botanical gardens
- (c) national parks
- (d) wildlife sanctuaries

**Ans: (a)**

**Q.3 Out of all the Biosphere Reserves in India, four have been recognized on the World Network by UNESCO. Which one of the following is not one of them? (2008)**

- (a) Gulf of Mannar
- (b) Kanchenjunga
- (c) Nanda Devi
- (d) Sunderbans

**Ans: (b)**