

**A BRIEF NOTE ON**

# **ECOLOGICAL CONDITIONS**

# **IN INDIA**

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# INDEX

1	Introduction
2	The Himalayan Region
3	The Desert Region
4	The Northern Plains
5	The Peninsular Plateau
6	The Coastal Areas
7	The Indian Islands
8	References

# Introduction

India is the most populated democracy in the world and is the seventh largest country by land area. It is surrounded by the Indian Ocean on the south, the Arabian Sea on the southwest and the Bay of Bengal on the southeast. It also accounts for the bulk of the Indian subcontinent, lying atop the Indian tectonic plate, a part of the Indo-Australian plate. India's coastline measures **7,517** kilometers in length, including Indian Islands. Indian population is highly diverse, consisting of thousands of ethnic groups and hundreds of languages, with roughly one-sixth of the world's total population!

This is a brief note on ecological conditions in India by emphasizing the ecology of the following regions:

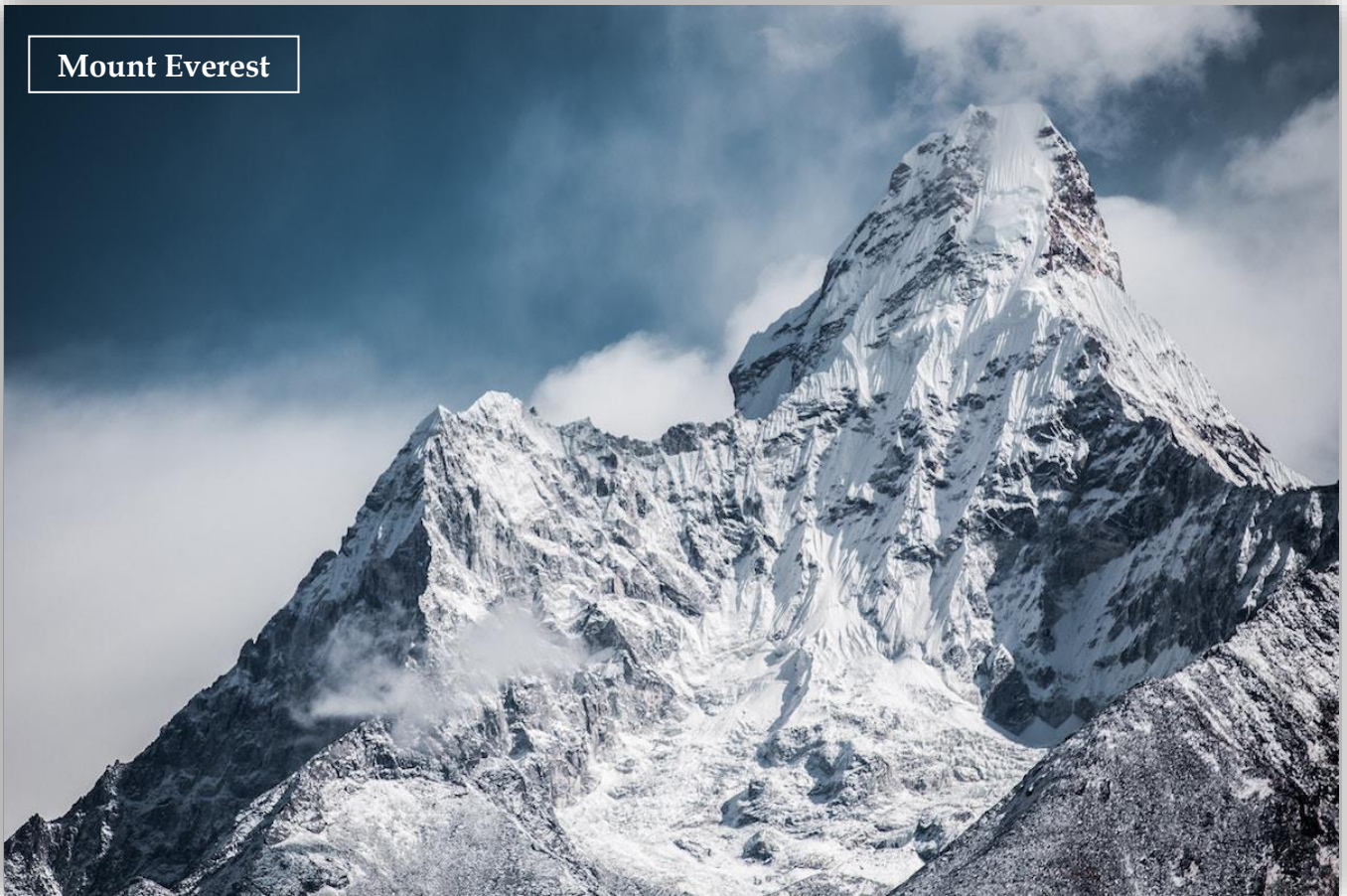
- 1) The Himalayan Region
- 2) The Desert Region
- 3) The Northern Plains
- 4) The Peninsular Plateau
- 5) The Coastal Areas
- 6) The Indian Islands



# The Himalayan Region

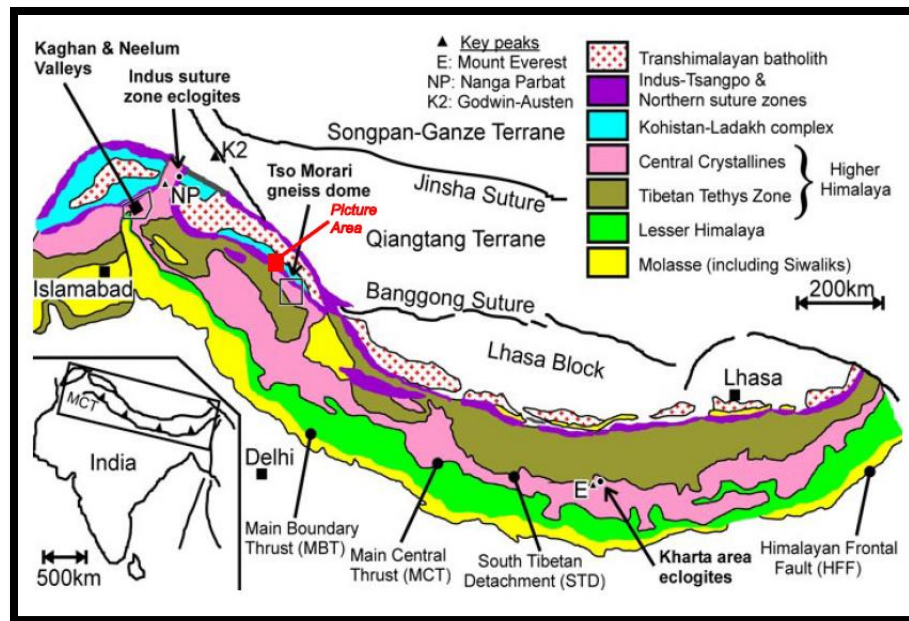
The Himalaya is a mountain range in India, which separates the plains of the Indian subcontinent from the Tibetan Plateau. The range consists of the world's highest peak, Mount Everest, which is **8,848 m**, along with over fifty other mountains exceeding **7,200 m** in elevation, including ten out of the fourteen **8,000 m** high peaks. This region is inhabited by **53 Million** people, which are spread across five different countries, namely India, Bhutan, Nepal, paksitan and china.

Mount Everest



Mount Everest is the world's highest mountain with height of **29,038 feet**. Interestingly, at a time there are more than 300 high altitude workers who constantly help mountaineers from all around the world to climb the mountain without facing any difficulties.

The Himalayan mountain range is located along the Northeastern part of India. It consists of parallel mountain ranges, namely, The Shivalik Hills on the south, The Lower Himalayan Range, The Great Himalayas and The Tibetan Himalayas on the north.



The climate on Himalayas is diverse, differing greatly depending on the region and elevation. Eco-regions found in Himalayas include mixed forests and temperature broadleaf forests, shrublands, subtropical and tropical broadleaf forests and montane grasslands.

The flora and fauna of the Himalayas vary with climate, rainfall, altitude, and soils. At high altitudes, the elusive and previously endangered snow leopard is the main predator. Other endemic or near endemic herbivores include the Himalayan tahr, the takin, the Himalayan serow, and the Himalayan goral. The critically endangered Himalayan subspecies of the brown bear is found sporadically across the range as is the Asian black bear. In the mountainous mixed deciduous and conifer forests of the eastern Himalayas, Red panda feed in the dense understories of bamboo. The highest known tree species in the Himalayas is called the *Juniperus tibetica* located at **4,900 m** in Southeastern Tibet.



The Himalayas are home to a diversity of medicinal resources. Plants from the forests have been used for millennia to treat conditions ranging from simple coughs to snake bites. They are also a source of many minerals and precious stones. Amongst the tertiary rocks, are vast potentials of mineral oil. There is coal located in Kashmir, and precious stones located in the Himalayas. There is also gold, silver, copper, zinc, and many other such minerals and metals located in at least 100 different places in these mountains.



Himalayas, as a region, have always been susceptible to disaster, due to the neo-tectonic mountain-building process, like earthquakes, landslides, etc. Avalanches constitute a major hazard in the higher elevations of Himalayas. Parts of the Himalayas receive snowfall around the year and adventure sports are in abundance in such locations. Severe snow avalanches occur in Jammu & Kashmir, Himachal Pradesh and the Hills of Western Uttar Pradesh.

# The Desert Region

The Great Indian desert, commonly known as Thar Desert, is a large arid region in the northwestern part of India, that covers an area of **170,000 sq km**. More than **60%** of it lies in Rajasthan, which further extends into the states of Gujarat, Punjab and Haryana. Most of the desert area is covered by huge shifting sand dunes that receive sediments from the alluvial plains and the coast. Also, there are Salt water lakes within the Thar Desert.

The Thar desert has a fairly high population density of **83** people per sq km. Overall, it has a total population of **16,600,000**.



Stretches of sand in the desert are interspersed by hillocks and sandy and gravel plains. Due to the diversified habitat and ecosystem, the vegetation, human culture and animal life in this arid region is very rich in contrast to the other deserts of the world. About **23** species of lizard and **25** species of snakes are found here and several of them are endemic to the region. Some wildlife species, which are fast vanishing in other parts of India, are found in the desert

in large numbers such as the blackbuck, chinkara and Indian wild ass in the Rann of Kutch. Other mammals of the Thar Desert include a subspecies of red fox and the caracal.



Agriculture is not a dependable proposition in this area because after the rainy season, at least one third of crops fail, because the region faces frequent droughts. Overgrazing due to high animal populations, wind and water erosion, mining and other industries have resulted in serious land degradation.



Desert safaris on camels have become increasingly popular in Thar Desert. Domestic and international tourists frequent the desert seeking adventure on camels for anything from a day to several days. This ecotourism industry ranges from cheaper backpacker treks to plush Arabian night style campsites replete with banquets and cultural performances.

Thar region of Rajasthan is the biggest wool-producing area in India. Out of the total wool production in India, **40-50%** comes from Rajasthan. The sheep-wool from Rajasthan is considered to be the best in the world for the carpet



making industry. It is also an ideal place for generation of electricity from wind power. According to an estimate Rajasthan state has got a potential of **5500-megawatt** wind power generation.

Thar Desert, Rajasthan has an average rainfall of **280 mm** annually, but during the monsoon of **2006** it received about **600 mm** of rain within **2–3 days**. Several hamlets and small villages have been wiped out after the **19–21 August** rains. The region experienced one of the worst floods in a hundred years.



# The Northern Plains

From the south of the Himalayas till the north of the Peninsula lies the Great Plain of North India, commonly referred to as the Northern Plains of India, which is spread in a 2.5-million sq km area. It is an aggregational plain formed by the deposition work of the three major river systems, the Ganga, the Indus and the Brahmaputra. It is also known as Indo-Gangetic-Brahmaputra Plain. This is the largest alluvial tract of the world extending for a length of **3,200 km** from the mouth of the Indus to the mouth of Ganga, of which the Indian sector alone accounts for **2,400 km** in length.



The Indo-Gangetic Plain is divided into two, the western part that drains to the Indus, and the eastern part that consists of the Ganga–Brahmaputra drainage systems, by the Delhi Ridge.

Until recent history, the open grasslands of the Indus-Ganga Plain were inhabited by several large species of animal. The open plains were home to large numbers of herbivores which included all three of the Asian rhinoceros (Indian rhinoceros, Javan rhinoceros, Sumatran rhinoceros). Large herds of Indian elephants, gazelles, antelopes and horses lived alongside several species of wild cattle including the now-extinct aurochs. In the forested areas there were several species of wild pig, deer and muntjac. Most of these animals are no longer present.

Farming on the Indus-Ganga Plain primarily consists of rice and wheat grown in rotation. Other crops include maize, sugarcane, and cotton. The main source of rainfall is the southwest monsoon which is normally sufficient for general agriculture. The many rivers flowing out of the Himalayas provide water for major irrigation works. Due to a rapidly growing population and couple other factors, this area is considered at high risk for water shortages in the future.



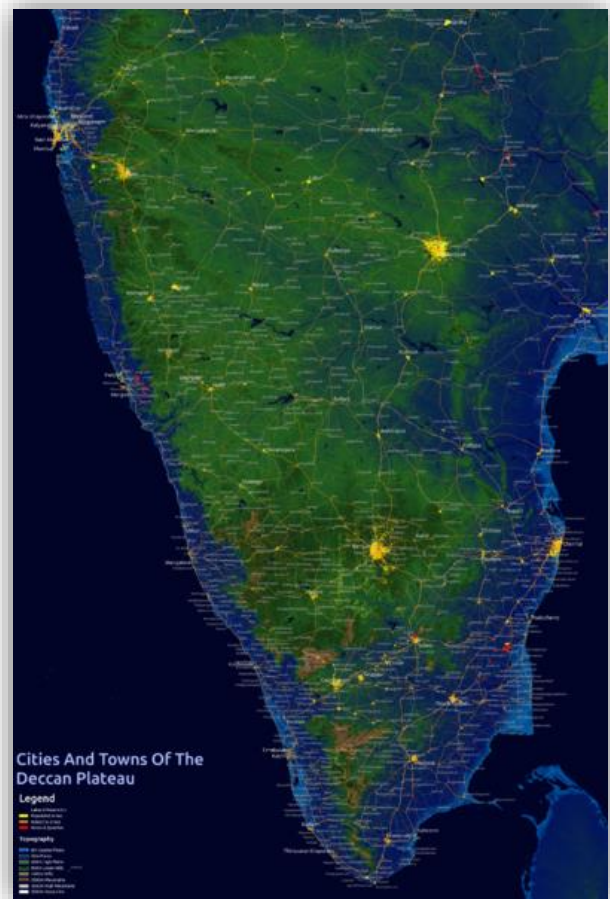
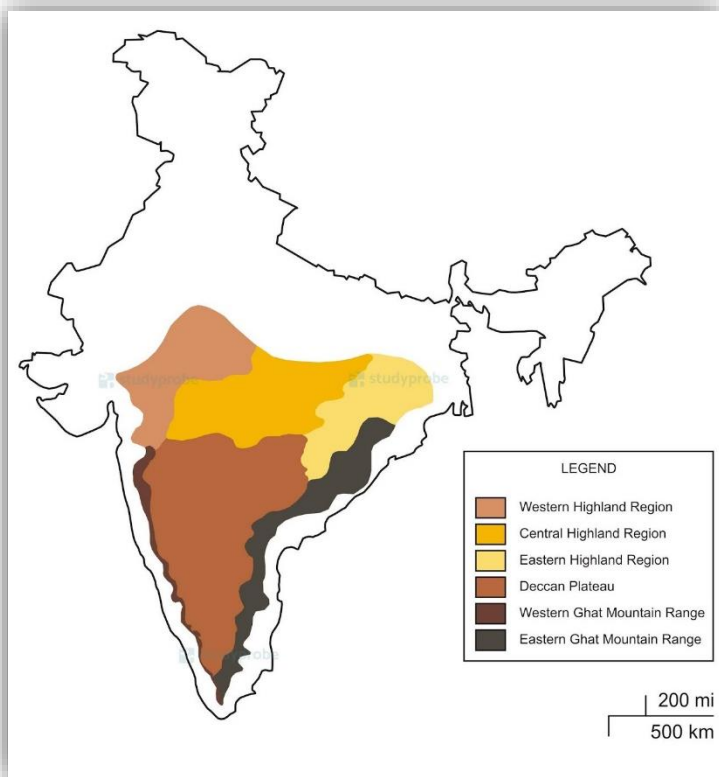
Multiple River Flooded in Bihar on **October 2011**, leading to more than **100** deaths, followed by heavy rainfall throughout the region.

(The Moderate Resolution Imaging Spectroradiometer (MODIS) on NASA's Terra satellite captured these images of River Ganga.)



# The Peninsular Plateau

The Peninsular Plateau is a large plateau in western and southern India. It is a tableland composed of the old crystalline, igneous and metamorphic rocks. It rises to **100 m** in the north, and to more than **1,000 m** in the south, forming a raised triangle within the south-pointing triangle of the Indian coastline. It extends over eight Indian states with over **300 million** people living in the greater area of the Deccan Plateau.



The Deccan plateau is a topographically variegated region located south of the Gangetic plains-the portion lying between the Arabian Sea and the Bay of Bengal-and includes a substantial area to the north of the Satpura Range, which has popularly been regarded as the divide between northern India and

the Deccan. The plateau is bounded on the east and west by the Ghats, while its northern extremity is the Vindhya Range. The Deccan's average elevation is about **600 m**, sloping generally eastward. Its principal rivers are the Godavari, Krishna, and Kaveri, which flows eastward from the Western Ghats to the Bay of Bengal.

**Hill ranges in the plateau are:**

- ✚ The Aravalli Range
- ✚ The Vindhyan Range
- ✚ The Satpura Range
- ✚ The Sahyadris
- ✚ The Eastern Ghats



The climate of the region varies from semi-arid in the north to tropical in most of the region with distinct wet and dry seasons. The plateau's climate is drier than that on the coasts and is arid in places.

The northwestern part of the Peninsular plateau is made up of lava flows or igneous rocks known as the Deccan Traps. The rocks are spread over the whole of Maharashtra and parts of Gujarat and Madhya Pradesh, thereby making it one of the largest volcanic provinces in the world. It consists of more than **2000 m**, of flat-lying basalt lava flows and covers an area of nearly **500,000 sq km** in west-central India. The thick dark soil (called silt) found here is suitable for cotton cultivation.



The large areas of remaining forest on the plateau are still home to a variety of grazing animals from the four-horned antelope and blackbuck to the large gaur and wild water buffalo.

The Deccan plateau is very rich in minerals and precious stones. The plateau's mineral wealth led many lowland rulers, including those of the Mauryan (**4th–2nd century BCE**) and Gupta (**4th–6th century CE**) dynasties, to fight over it. Major minerals found here include coal, iron ore, asbestos, chromite, mica, and kyanite. Since March **2011**, large deposits of uranium have been discovered in Karnataka. The Tummalapalle belt uranium reserve promises to be one of the **top 20** uranium reserve discoveries of the world.



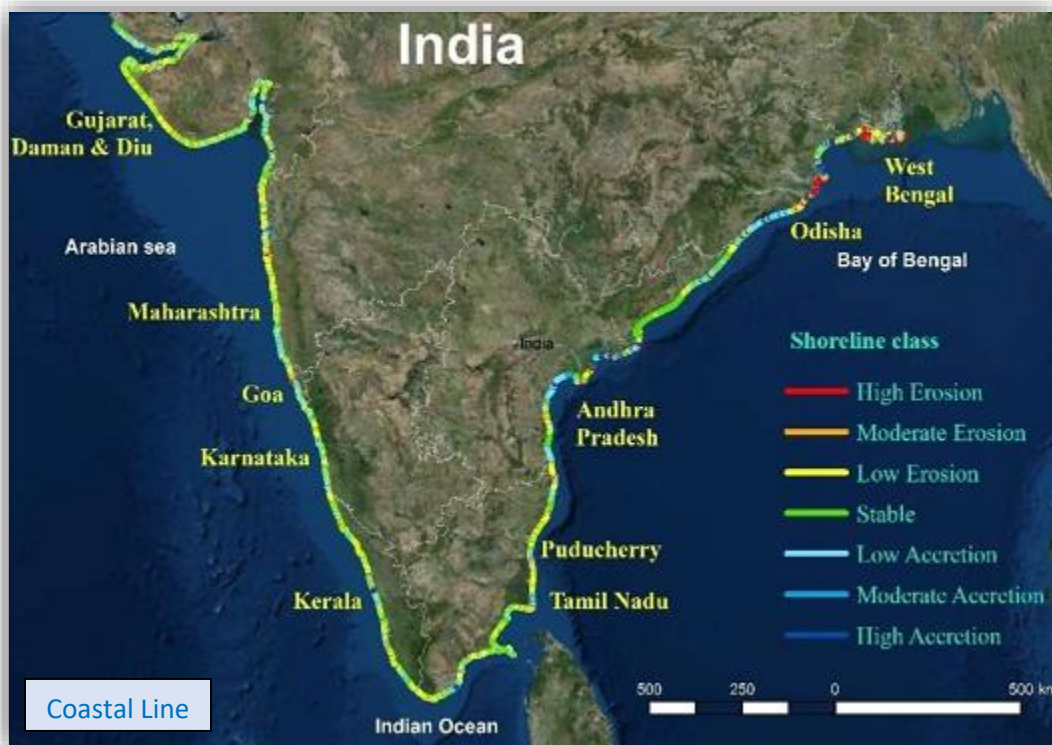
Large parts of the peninsula that receive two monsoons a year face a severe water scarcity for the second consecutive cropping season. In fact, for the first time in 140 years, all the five states have received large deficit rains (40-77 per cent) during the winter monsoon, which contributes 30-80 per cent of the total rainfall the region receives in a year.



Mountains in the Peninsular Plateau

# The Coastal Region

India is surrounded from 3 sides by water bodies, forming a coastline of length **6100 km**. Length of coastline of India including the coastline of Andaman and Nicobar Islands in the Bay of Bengal and Lakshadweep Islands in the Arabian Sea is **7517 km**. Coastline of Indian mainland is surrounded by Arabian Sea in the west, Bay of Bengal in the east, and Indian Ocean in the south.



The Western Coastal Plain is a narrow strip of land sandwiched between the Western Ghats and the Arabian Sea, ranging from **50 to 100 km** in width. It extends from Gujarat in the north and extends through Maharashtra, Goa, Karnataka, and Kerala. Numerous rivers and backwaters inundate the region. Major rivers flowing into the sea are the Tapti, Narmada, Mandovi and Zuari.

The Eastern Coastal Plain is a wide stretch of land lying between the Eastern Ghats and the oceanic boundary of India. It stretches from Tamil Nadu

in the south to West Bengal in the east. The Mahanadi, Godavari, Kaveri, and Krishna rivers drain these plains, exiting into the Bay of Bengal. The width of the plains varies between **100** and **130 km**.



Large parts of the coastal plains of India are covered by fertile soils on which different crops are grown. Rice is the main crop of these areas. Coconut trees grow all along the coast. The entire length of the coast is surrounded with big and small ports, which helps in carrying out trade. About 98% of international trade is carried out through these ports. The sedimentary rocks of these area are considered to contain large deposits of mineral oil. Low lying areas of Gujarat are famous for producing salt.



# The Indian Islands

In India, there are a total of 1,208 islands, including uninhabited ones. Apart from the large number of islands in the near proximity of Indian coast, there are two main groups of Islands in the Indian Ocean far away from the coast. One of these is the Andaman and Nicobar archipelago in the Bay of Bengal and the other is a group of tiny islands known as Lakshadweep Islands in the Arabian seas.

The Andaman and Nicobar group of islands, extending from **6° 45' N to 13° 45' N** and from **92° 10' E to 94° 15' E**, covers a distance of about **6,408 sq km**. This archipelago is composed of **572** big and small islands. Though normally referred to as Andaman-Nicobar Islands, it consists of two distinct groups separated by a deep channel called Ten Degree Channel. As of now, the Andaman Island has a total of **434,000** inhabitants.



Most of these islands are made of tertiary sandstone, limestone and shale resisting on basic and ultrabasic volcanoes. The Barren and Narcondam islands, north of Port Blair, are volcanic islands. Some of the islands are fringed with coral reefs. Many of them are covered with thick forests and some are highly dissected.



The Lakshadweep Island is a group of 36 islands, inlets and reefs located in the Arabian Sea. They are widely scattered over an area of **109 sq km** extending from **8°N to 12°20'N** and **71°45'E to 74°E**. The largest one of them is the Minicoy island with an area of **4.5 sq km**. Most of the islands have low elevation and do not rise more than **5 m** above sea level. These islands are of the coral origin and have no hills or streams.

## Some of the most famous Islands are:

- ✚ Namesake of Colonel John Munroe, Munroe Island, Kerala
- ✚ The Largest River Island in The World, Majuli Island
- ✚ The Heart-Shaped Island, Netrani Island
- ✚ A Creation of Madagascar's Sub-Volcanic Activity, St Mary's Island
- ✚ The Andaman's Largest Island, Havelock Island, Andaman
- ✚ Host of Asia's Longest Beach Festival, Diu Island
- ✚ The Place of The Gods, Divar Island
- ✚ India's Most Famous Island Cluster, Lakshadweep Islands
- ✚ The Smallest Island in India, Umananda Island
- ✚ The Floating Island, Sendra Island
- ✚ Home to A UNESCO World Heritage Site, Elephanta Island
- ✚ Home to South Asia's Only Active Volcano, Barren Island, Andaman



As a matter of fact, Munroe Island is sinking due to rising water levels owing to global warming, forcing many of its village (Munroe Thuruthu) residents to leave.



The Andaman and Nicobar Islands are home to some of the richest varieties of flora and fauna, with 86% of the islands covered in primary tropical rainforests. At least two species of wild boars, feral elephants, four species of sea turtles, and wild saltwater crocodiles make the islands a wildlife hotspot.

Andaman and Nicobar tropical rain forests have a rich biodiversity with numerous endemic species. The forests present here produces timber, herbs and plants with medicinal value, mineral nodules (Manganese, chromite, etc.) and is a habitat to aboriginal tribes like Jarawas, Ongos, coral reefs and bounty fishing zones.

Lakshadweep Islands - Basically, it is of coral origin and have less or no mineral resources. But it is famous for coconut plantations, fisheries, wide varieties of flora and fauna.



Ross Island