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&  
DISASTER MANAGEMENT**

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**Indian Geography & Disaster Management**

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# **PART-I** **INDIAN** **GEOGRAPHY**

# CHAPTER 1

# INDIA: SIZE AND LOCATION

## 1.1 Introduction

India is a land of diversity not only because of its cultural variability in all its regions but also because of the varying characteristics of the land. The landmass of India extends from the sub-zero glaciers of Kashmir to the tropical and hot climate of Tamil Nadu. Such vast contrast in climate and temperatures can be experienced in many regions of India like the Great Himalayas in the north, fertile soil of Great Plains, dry subtropical Thar Desert in the west, tropical eastern and western Coastal Plains and many more.

These features have contributed for considering India as the subcontinent as it possesses all the characteristics of a continent.

## 1.2 Size and Extent

In terms of area, India is the seventh largest country in the world. This area also includes the unlawful occupation of India's land by Pakistan and China. Thus, besides being known for its diversity, India has also been known for its vastness.

India is a vast country with her mainland extending between latitudes  $8^{\circ}4'N$  and  $37^{\circ}6'N$  and longitudes  $68^{\circ}7'E$  and  $97^{\circ}25'E$ . It covers an area of 32,87,263 sq. km from the snow covered Himalayan from north to the southern tip of Kanyakumari.

The latitudinal and longitudinal extent of India is about  $30^{\circ}$  and measures about 3,214 km from north to south between the extreme latitudes and about 2,933 km from east to west between its extreme longitudes. India lies entirely in the northern hemisphere.

Even though the longitudinal and latitudinal extent of mainland India is almost the same (i.e., about  $30^{\circ}$ ), there is a huge difference between the area encompassed by the north-south extent and that of east-west extent. This difference is because the distance between the longitudes decreases towards the poles whereas the distance between the latitudes remains the same everywhere.

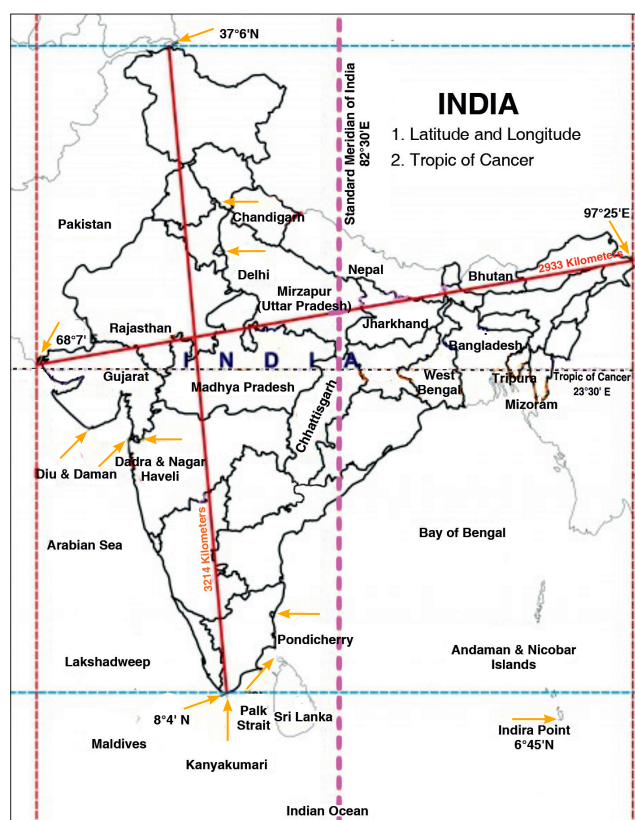


Fig. 1.1: Latitudinal and Longitudinal Extents of India

The Tropic of Cancer passes through eight states of India namely: Gujarat, Rajasthan, Madhya Pradesh, Chhattisgarh, Jharkhand, West Bengal, Tripura and Mizoram. *Udaipur city of Tripura* is the closest to the Tropic of Cancer. The *Sun Temple of Modhera* in Gujarat is located on the Tropic of Cancer.

### Some Important Facts

- The northernmost point of India is *Indira Col* in Ladakh.
- The southernmost point of India is *Pygmalion Point* or *Indira Point* in Andaman and Nicobar islands, it is located at  $6^{\circ}46'N$  latitude and  $93^{\circ}49'E$  longitude.
- Similarly, the westernmost point of India is *Ghuar Mota* in the Kutch region of Gujarat. It is located near the disputed Sir Creek and the Koteswar temple, at  $23.713^{\circ}N$  and  $68.032^{\circ}E$ .
- *Kibithu* in Arunachal Pradesh is the Easternmost point of India.

<b>Total Area</b>	32,87,263 sq. km
<b>Latitude</b>	8°4' N to 37° 6' N
<b>Longitude</b>	68° 7 E to 97° 25 E
<b>North to South</b>	3214 sq. km
<b>East to West</b>	2933 sq. km

The Tropic of Cancer (23° 30'N) passes through the middle of the country dividing India's mainland into almost two equal parts. The northern part lies in the *sub-tropical zone* and the southern part lies in the *tropical zone*. This makes the northern part of India to experience cold winters and hot summers while the southern part of India experiences hot and humid weather throughout the year.

### Position of India

The area of temperate part of India (lying to the north of the Tropic of Cancer) is considered twice the area of tropical part. But India has always been treated as a tropical country for two different reasons:

- **Physical Geographical Reasons:** The country is separated from the rest of Asia by the Himalayas. Its climate is dominated by the tropical monsoons and the temperate air masses are blocked by Himalayas. The entire area south of the Himalayas is essentially tropical from climatic point of view. Although the night temperatures in winter at several places in North India may come down to the level of those prevailing in temperate lands, yet clear skies and intense insolation raise the day temperatures to a tropical level.
- **Cultural Geographical Reasons:** Settlements, diseases, agricultural and primary economic activities of India are tropical in nature.

### Impact of Large Latitudinal and Longitudinal Extent

- **Climatic Diversity:** The large latitudinal and longitudinal extent ensure climatic diversity in India. The area south of the Tropic of Cancer is referred to as the southern half of India. It has tropical climate because Sun rays strike the Earth's surface nearly vertically at noon. The ocean on the both sides of the peninsular landmass help keep the temperature warm. Toward the north of Tropic of Cancer, the remaining half of India experiences subtropical climate. The reason behind this is that here Sun rays strike relatively in an oblique manner. Consequently, this part of India receives lesser amount of insolation and has a cold climatic season, unlike the southern part.
- **Length of a Day:** The difference between days and nights goes on increasing from the equator towards

the poles. The day and night in southern-most part of India is almost of equal duration with the difference being only 45 minutes. This difference between day and night in the northern part of India steadily goes on increasing till it becomes as much as 5 hours in Ladakh.

- **Timeline:** The Earth takes 24 hours to rotate on its axis. The longitudinal expansion is 360°, which the Earth covers in 24 hours, thereby covering 15° of longitude in one hour. As the longitudinal extent of India is nearly 30°, it takes nearly 2 hours to cover India from its east to west extremities.

Now, as the Earth rotates from west to east, the Sun appears to emerge first on the eastern horizon. Since Arunachal Pradesh is towards the east of India, it is the first state to witness the sunshine in India while Saurashtra in Gujarat is the last to witness the sunrise about 2 hours later.

This difference in real local time zone created a problem of administrative coordination. Therefore, the time of longitudinal middle of India at *82°30'E longitude near Allahabad is taken as a Standard Meridian Time (SMT) of India*. It means that when its noon in Allahabad, the time for whole of India is taken as noon. As far as the International Standard Time (Greenwich Meridian Time) is concerned, the difference between it and Indian Standard Time (IST) is around 5.30 hours.

## 1.3 Coastline of India

India has the longest coastline on the Indian Ocean. According to Ministry of Earth Sciences, India has a coastline of about 7516.6 km of which about 5423 km is shared by nine states and two union territories on the mainland and about 2093.6 km is shared by the island territories.

Among states, Gujarat (1214.7 km) has the highest coastal length and the Andaman and Nicobar (1962 km) has the highest coastal length among Union Territories.

State and UT	Length of Coastline (km)
Gujarat	1214.7
Andhra Pradesh	973.7
Tamil Nadu	906.9
Maharashtra	652.6
Kerala	569.7
Odisha	476.4
Karnataka	280
Goa (Daman & Diu)	160.5
West Bengal	157.5

State and UT	Length of Coastline (km)
Andaman & Nicobar Islands	1962
Lakshdweep Islands	132
Puducherry	30.6

### Territorial Waters of India

A **baseline** is the line along the coast from which the seaward limits of a state's territorial sea and certain other maritime zones of jurisdiction are measured. Normally, a sea baseline follows the low-water line of a coastal state. When the coast is deeply indented, has fringing islands or is highly unstable, straight baselines may be used. The **territorial waters** extends up to 12 nautical miles from the baseline.

The **Contiguous Zone** of India extends up to 24 nautical miles from the baseline. In this zone, India has the right to exercise the necessary control i.e. prevent infringement of its customs, fiscal rights immigration and other regulations over the territorial sea.

The India's **Exclusive Economic Zone (EEZ)** adjacent to the territorial sea extends up to 200 nautical miles from the baselines from which the breadth of the territorial sea is measured. In the exclusive economic zone, India has rights for the purpose of exploring, exploiting, conserving and managing natural resources.

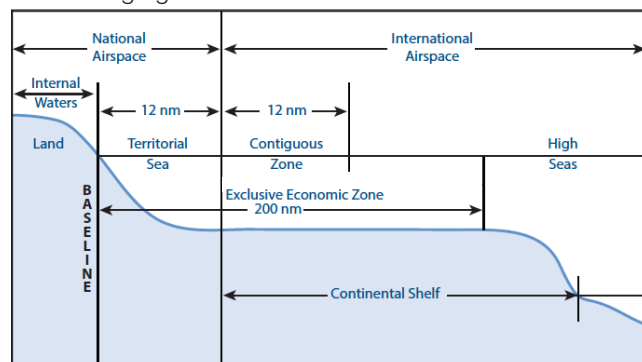


Fig. 1.2: Legal Maritime Boundaries

## 1.4 Islands of India

### Andaman and Nicobar

The main island that come under the Andaman and Nicobar Islands are - North Andaman, Middle Andaman, South Andaman, Little Andaman, Car Nicobar and Great Nicobar.

The Port Blair, the capital of Andaman and Nicobar island situated in Middle Andaman. The Indira point is the southernmost point of India is the southernmost point of Great Nicobar. The Barren island which is India's only **Active Volcano** situated in east of Middle Andaman. The

Narcondam island is a volcanic island. The 10 degree channel separate Andaman from Nicobar.

The **Duncan Pass** separates South Andaman in the north, from Little Andaman in the south. The **Grand channel** is between Great Nicobar and Sumatra (Indonesia). The Andaman and Nicobar Islands are also known as Emerald Island.

Channel	Separates
Coco Channel	Separates Myanmar from Andaman and Nicobar Island Group
Duncan passage	Separates little Andaman from south Andaman
10-degree channel	Separates Andaman group from Nicobar group
9-degree channel	Separates Minicoy from rest of Lakshadweep
8-degree channel	Separates Lakshadweep group from Maldives
6-degree channel	Separates India's great Nicobar island from Sumatra island of Indonesia

### Lakshadweep

In the Arabian Sea, there are three groups of islands. Amindivi Islands, Laccadive Islands (consisting of five major islands including Kavaratti) and Minicoy. At present these islands are collectively known as Lakshadweep.

The Lakshadweep Islands are a group of 36 small islands. They are widely scattered about 200-500 km south-west of the Kerala coast. Amindivi Islands are the northernmost while the Minicoy island is the southernmost.

All are tiny islands of coral origin and are surrounded by fringing reefs. The Andrott is the largest Island and the Minicoy is the second largest. Most of the islands have low elevation and do not rise more than five meters above sea level (extremely vulnerable to sea level change). Their topography is flat and relief features such as hills, streams, valleys, etc. are absent

## 1.5 India's International Borders

India has a land frontier of about 15,106.7 km and shares its land boundaries with seven countries namely: Pakistan and Afghanistan in the northwest; China, Nepal and Bhutan in the north and Myanmar and Bangladesh in the east.

Two island countries, namely Sri Lanka and Maldives are India's southern neighbours across the sea. Sri Lanka is separated from India by a narrow channel of sea formed

by the *Palk Strait* and Maldives is separated from the Lakshadweep by the *Eight degree Channel*.

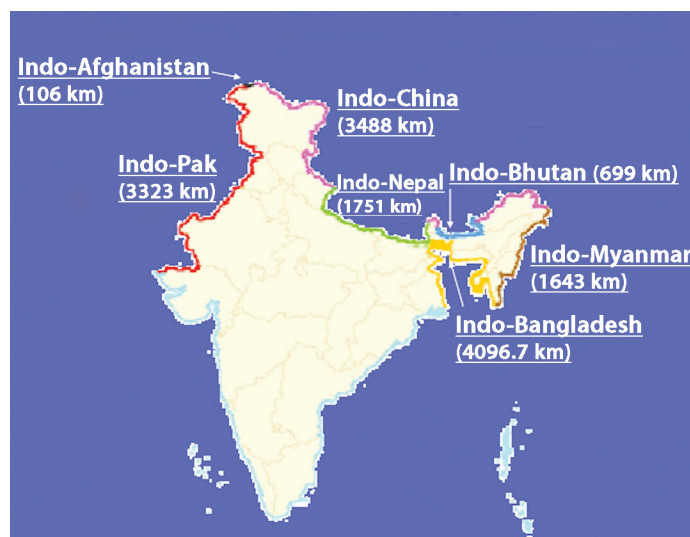


Fig. 1.3: International Land borders of India

India's Borders with Neighbouring Countries			
Country	Border Length (km)	Bordering States	Border Disputes (if any)
Bangladesh	4096.70	West Bengal, Mizoram, Meghalaya, Tripura, Assam	The implementation of the Land Boundary Agreement (between India and Bangladesh) of 1974 and its Protocol of 2011 has settled all outstanding land boundary issues between India and Bangladesh. The award rendered by Arbitration Tribunal for Delimitation of Maritime Boundary between India and Bangladesh on July 7, 2014 has settled maritime boundary between India and Bangladesh.
China	3488	Ladakh, Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh	Indian territory under the occupation of China in Ladakh is approximately 38,000 sq. kms. In addition, under the so-called <i>China-Pakistan "Boundary Agreement"</i> signed between China and Pakistan on 2 March 1963, Pakistan illegally ceded 5,180 sq. kms. of Indian territory in <i>Pakistan Occupied Kashmir (POK)</i> to China.
Pakistan	3,323	Jammu & Kashmir, Ladakh, Punjab, Rajasthan, Gujarat	Pakistan is in illegal and forcible occupation of approximately 78,000 sq. kms of Indian Territory in Jammu and Kashmir. The International Boundary in the <i>Sir Creek</i> area and International Maritime Boundary line (IMBL) between India and Pakistan have not been demarcated.
Nepal	1,751	Uttarakhand, Uttar Pradesh, Bihar, West Bengal, Sikkim	India and Nepal share an open border. Nearly 98% of the boundary strip maps have been agreed to and finalised in 2007. The matter regarding formal signing of boundary strip maps is being pursued with Government of Nepal.
Myanmar	1643	Arunachal Pradesh, Nagaland, Manipur, Mizoram	There is no border dispute between India and Myanmar. There are, however, nine unresolved Boundary Pillar (BPs) along the India-Myanmar Border in the Manipur Sector. Also, the India-Myanmar border has the <i>free movement regime</i> which allows the tribes living along the border to travel 16km across the boundary without visa restriction.

India's Borders with Neighbouring Countries			
Country	Border Length (km)	Bordering States	Border Disputes (if any)
<b>Bhutan</b>	<b>699</b>	Assam, Sikkim, West Bengal, Arunachal Pradesh	Nil
<b>Afghanistan</b>	<b>106</b>	Ladakh (POK)	Nil
<b>Total</b>	<b>15106.7</b>		

Important Border Lines of India with its Neighbours		
Borders Line	Countries	Facts
Line of Control (LOC)	India and Pakistan	<ul style="list-style-type: none"> <li>Military control line.</li> <li>Also called Cease-fire Line.</li> </ul>
McMahon Line	India and China	<ul style="list-style-type: none"> <li>Boundary line between north-eastern India and China. (It is disputed by Chinese government).</li> </ul>
Line of Actual Control (LAC)		<ul style="list-style-type: none"> <li>Border line</li> <li>Also called as boundary line of India and China in east and west.</li> </ul>
Radcliffe Line	India and Pakistan, India and Bangladesh	<ul style="list-style-type: none"> <li>Boundary line</li> <li>Drawn after the independence of India and Pakistan.</li> <li>It separates both west and east Pakistan (Now Bangladesh).</li> </ul>
Palk Strait	India and Sri Lanka	<ul style="list-style-type: none"> <li>Water body of narrow channel</li> </ul>
Chicken's Neck or Siliguri Corridor	Narrow region of Indian state West Bengal	<ul style="list-style-type: none"> <li>Connects the north-eastern states to rest of India.</li> <li>Neighboring countries Nepal, Bhutan and Bangladesh surround this region.</li> <li>Politically sensitive for its proximity to different international borders.</li> </ul>
Akhnoor Dagger	Pakistan	<ul style="list-style-type: none"> <li>Narrow strip of Pakistani territory which extends into the Indian state Jammu and Kashmir.</li> <li>Very sensitive land as it can effect movement of army in the area.</li> </ul>

■■■■



## TRY SOME PRELIMS PREVIOUS YEAR QUESTIONS

1. Among the following cities, which one lies on a longitude closest to that of Delhi?

(a) Bengaluru (b) Hyderabad  
(c) Nagpur (d) Pune

Ans. (a)

(2018)

2. Consider the following statements:

- The Barren Island volcano is an active volcano located in Indian territory.
- Barren Island lies about 140 km east of Great Nicobar.
- The last time the Barren Island volcano erupted was in 1991 and it has remained inactive since then.

Which of the statements given above is/are correct?

(a) 1 only (b) 2 and 3  
(c) 3 only (d) 1 and 3

Ans. (a)

(2018)

3. Which of the following is geographically closest to Great Nicobar?

(a) Sumatra (b) Borneo  
(c) Java (d) Sri Lanka

Ans. (a)

(2017)