Samples from

WORLD GEOGRAPHY, GEOGRAPHY THEORIES & ENVIRONMENT
REGIONAL GEOGRAPHY
OF THE WORLD

Overview

Have you ever gone to Shimla by train? No! You must go atleast once to have a lifetime experience of Himalayas. If you would have more time, take a bike and make a group trip from Chandigarh to upper reaches of Himalayas in J&K. You will find gigantic features - Indus destroying the great mountains creating 1 km deep gorges, something similar to Death Valley of California! Ask someone who visited Africa; just see his photos. The huge deserts in the background would open your yaws. The dense jungles of River Congo will make you feel like a night even during full sunlight. If someone known has gone to Europe for a honeymoon, just ask him his experience. The beautiful beaches and lakes of Europe are the proof that if man desires, he can maintain the endless beauty of our earth.

Life is too short. Nature has given us bountiful features; regional geography is all about to live nature!
ASIA

- Asia accounts for one-third of world’s land area and about 60% of its population
- Asia—Largest continent both in area and in population.
- About 72.2% of people live in villages. Japan is the only exception where more than 75% people are urban.
- It has less than 20% land suitable for Agriculture
- Tropic of Cancer in Middle East passes through Saudi Arabia, U.A.E. and Oman. Muscat (Capital of Oman) is located on it. It also passes through India, Bangladesh & Myanmar besides China and Taiwan.
- Persian Gulf touches Saudi Arabia, U.A.E., Kuwait, Iraq & Iran, Oman & Bahrain

PHYSICAL FEATURES

NORTHERN LOWLANDS (SIBERIAN PLAINS)

- Plains between Ural Mountains in the West and Lena River in the east are called as Siberian Plains
- Drained by Rivers Ob, Yenisei and Lena.
- Lake Baikal—deepest lake of the world is located here

MOUNTAINS

- Pamir Knot (Plateau) is the meeting place of several ranges of Asia
- This Plateau is highest in the world and known as “Roof of the world”
- Hindu Kush extends to the west, Tien Shan towards N. East, Kunlun to east and the Karakoram and Himalayas to the S-E.
- To the west of Hindu Kush, two ranges of Mountain ranges diverge. In North Elburz (extend along south of Caspian Sea) and in South Zagros Mountains (extend along Arabian Sea and Overlooks Persian Gulf).
- Elburz and Zagros Mountains enclose the Plateau of Iran
- These two ranges converge in the west at the knot of Mount Ararat
- Again two groups of Mountain ranges diverge westward from Mount Ararat, Pontic in the north and Taurus in the south.
- Plateau of Anatolia is enclosed between Pontic and Taurus.
- South Eastward of Pamir lies Karakoram Range and Himalayan range.
- K2 (Godwin Austin in POK) is the highest Peak of Karakoram, whereas Mt. Everest is highest peak in the Great Himalayas.
- Between these two ranges in south and Kunlun in the north, is the Tibetan Plateau.
- Further north, Tarim basin is located between Kunlun in south and Tien Shan in north.
Having older rocks than that of Mountains ranges
Plateau of Arabia, Deccan Plateau and Plateau of Yunnan are its parts

**THE GREAT RIVER VALLEYS**

- Tigris & Euphrates (Iraq).
- **Baghdad** is located on river Tigris. Both of these fall into Persian Gulf.
- Ancient Mesopotamian culture flourished between these two rivers.
- Indus (Pakistan)
- Ganga-Brahmaputra (India and Bangladesh)
- Ayeyarwaddy or Irrawaddy (Myanmar)
- Mekong (South-East Asian countries)
- Sikiang, Chang Jiang (Yang-Tse-Kiang) and Huang He (Hwang-Ho) in China

**THE ISLAND GROUPS**

- Indonesia, Philippines and Japan.
- Most of these islands have Mountains core surrounded by narrow coastal plains, have extremely fertile soil (basically volcanic ash)

**CLIMATE**

**WINTERS**

- Interior part of Asia becomes extremely cold, temperature decreases, air contracts forming high pressure area over Mongolia. Dry winds blow outward. Therefore most of the parts of Asia do not get rain though while blowing over the sea, winds pick up moisture and cause rainfall in some areas.
- **Oymyakon** in N-E Siberia is the **coldest place** in the **Northern Hemisphere** [Mean January Temperature (~ -45°)].

**SUMMERS**

- Temperature rises in the interior parts of Asia, air expands, create low pressure areas. Now High Pressure areas are located over oceans and winds starts blowing towards low pressure areas, causing rainfall in most of the areas.
- **Mawsynram** in Meghalaya (India) is the **wettest place** in the world; however **Mt Waialeale in Hawaii Island (USA)** recorded highest annual average rainfall (11,680 mm) in the world in 2007.

**NATURAL VEGETATION & WILD LIFE**

**TUNDRA BELT**

- Lies along northern coast of Asia, covered with snow for major part of the year. Precipitation is about **30 cm annually**. Vegetation – Mosses and Lichens.

**TAIGA**

- To the south of Tundra, belt of **coniferous forests** (**softwood-used for paper industry**)
- Found in Russia, Japan (also in Himalayan region)
- Precipitation – Between 25 and 50 cm
- Vegetation – Pine, Fir and Spruce. Used as timber and for making pulp and rayon
- Animals – Fur bearing e.g. fore, sable, mink

**STEPPE**

- Temperate grasslands, next to taiga. Winters cold, summers hot.
- Rainfall – Between 20–40 cm
- Animals – Grass eating e.g. antelopes

**DESERTS**

- Large parts of South West and Central Asia
- **Hot desert** – Arabia and Thar.
- **Cold desert** – Gobi and Tibet.

**MONSOON REGIONS**

- South, S-E and East Asia
- Summers hot and humid
- Rainfall – Between 60 and 250 cm, mostly in summers
- **Vegetation – Teak, sal and sandal wood**
- In N-E Asia, the climate is generally cooler and hence monsoon forests give way to temperate woodlands.
- Extreme Southern portions, closer to the equator have equatorial rainforests, dense and contain variety of trees, plants and bushes.

**MAJOR CROPS**

- Cultivation of **rice** is mainly confined to Monsoon Asia as it require warm and humid climate
- **Wheat** is the main crop of sub-tropical and temperate parts of the continent. W-Siberia, Kazakhstan, China, North India, Pakistan and countries of S-W Asia are the main producers of the wheat.
- **Sugarcane** requires hot and moist climate and well-drained fertile soils. Grown in Pakistan, India, China, Thailand and Indonesia.
- **Tea** is grown in India, Sri Lanka, China, Japan and Indonesia
- **Cotton** is grown in dry areas. Major producers are China, countries of Central Asia, India and Pakistan.
- **Jute** is grown in fertile soil of the floodplains in Ganga-Brahmaputra delta
- **Rubber** is grown mainly in Malaysia and Indonesia, Thailand, India, China and Sri Lanka.

**DESERTS**

- **Gobi**: World’s greatest temperate desert lying in China and Mongolia. Inhabited by Mongol nomads
- **Lopnor**: Temperate desert lying in China, where China’s nuclear test centre is located.
- **Taklamakan**: Temperate desert lying in Tarim basin, a center for Buddhist culture
- **Rub-Al-Khali**: hot desert situated South of **S. Arabia**, rich in petroleum deposits
- **Dast-E-Lut**: A hot desert in **E. Iran**, rich in petroleum deposits
- **Dast-E-Kabir**: A hot and saline desert in **N. Iran**, rich in petroleum deposits.
- **Kyzilkum**: A temperate desert extended in Uzbekistan and Kazakhstan
- **Karakum**: Temperate desert in Turkmenistan, transversed by Trans-Caspian railway

### Few Important Rivers of Asia

<table>
<thead>
<tr>
<th>River</th>
<th>Drains Into</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hwang He</td>
<td>Gulf of Pohai</td>
<td><strong>Sorrow of China</strong> (owing to frequent floods), Carries loess from Gobi desert</td>
</tr>
</tbody>
</table>
| Yangtze Kiang   | E. China Sea       | - World’s largest **3-gorges dam** on it, also city of Wuhan & Shanghai on its banks  
                     |                                   | - The Three Gorges Dam Project was completed in **2009**.  
                     |                                   | - Located in the middle section of **Xiling Gorge**, one of the three gorges (the other two are Wu Gorge and Qutang Gorge)  
                     |                                   | - A **Yangtze Cruise** passes the Three Gorges Dam.  
                     |                                   | - **Tanzi Ridge** is located in the surveying point for the Three Gorges Dam Project  
                     |                                   | - The long-term ecological effects of the Three Gorges Dam have been described as ‘possibly catastrophic’.  
| Mekong          | South China Sea    | Passes through China, Myanmar, Thailand, Laos, Cambodia & Vietnam; Makes **boundary between** Myanmar & Laos, Thailand & Laos.  
| Amu Darya       | Aral Sea           | **Toshkent** located on it  
| Syr Darya       | Aral Sea           | **Baghdad** is located on it; Passes through **Turkey & Iraq**  
| Tigris          | Persian Gulf       | **Mesopotamian** located between Tigris & Euphrates. Passes through Turkey, Syria & Iraq  
| Euphrates       | Persian Gulf       |                                                                 |

![Map of rivers in Asia](image)
SEAS & LAKES

- **Okhotsk Sea**: An extension of Pacific Ocean, situated west of Kamchatka and frozen for 8 months
- **Sea of Japan**: Separates Japan from Mainland with rich petroleum deposits, with Vladivostok as ice-free port
- **Yellow Sea**: Named for its colour, at the **mouth of Hwang He**, separating Korea from China. Hwang He brings huge amount of sand to this sea.

![Map of Russia, including Okhotsk Sea, Sea of Japan, Yellow Sea, Kamchatka, Kola, Kanin, Malaya, Arabian, Sinai, Crimean peninsulas, and major lakes like Baikal, Van, Urmea, Qinghai.]

PENINSULAS

- **Kamchatka**: Part of Russia with inhospitable climate and earthquakes, famous for petroleum deposits
- **Kola**: Part of Russia with Murmansk as ice free port throughout the year (washed by warm North Atlantic drift), rich in minerals
- **Kanin**: Part of Russia with rich mineral deposits
- **Malaya**: Part of Malaysia with rich tropical rainforest, and tin, rubber and oil deposits
- **Arabian**: Largest peninsula in the world, mostly desert and famous for oil reserves
- **Sinai**: Part of Egypt with rich petroleum deposits mostly covered by desert. Captured by Israel in 1967 and returned in 1979
- **Crimean**: Part of Ukraine with mineral resources and important port on Black Sea
MAJOR INFRASTRUCTURE PROJECTS IN ASIA

TRANS-ASIAN RAILWAY (TAR)  
- It is a project to create an integrated freight railway network across Europe and Asia.  
- The Trans-Asian Railway Network Agreement is an agreement signed by seventeen Asian nations as part of a United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) effort to build a transcontinental railway network between Europe and Pacific ports in China.  
- The plan has sometimes been called the "Iron Silk Road" in reference to the historical Silk Road trade routes.  
- The Trans-Asian Railway network now comprises 117,500 km of railway lines serving 28 member countries.

ASIAN HIGHWAY (AH) PROJECT  
- It is also known as the Great Asian Highway  
- It is a cooperative project among countries in Asia and Europe and the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), to improve the highway systems in Asia.  
- Agreements have been signed by 32 countries to allow the highway to cross the continent and also reach to Europe.

SILK ROAD  
- China has launched a massive $79.8 billion infrastructure project in the northwest province of Gansu, which will facilitate trade and people exchanges between China and central Asia as part of its ambitious Silk Road plan.  
- The Silk Road projects involved a maze of roads and ports connecting Asia, Europe and Africa.  
- Also known as the “One Belt, One Road,” project.
| **SUNDA STRAIGHT BRIDGE – INDONESIA** | - The Sunda Staright Bridge is a planned road and railway mega project between the two large Indonesian islands of Sumatra and Java.  
- It includes several of the world’s longest suspension bridges, across the 27 km (17 mi) Sunda Strait |
| **KUNMING – SINGAPORE RAILWAY** | - The Kunming–Singapore Railway refers to a network of railways, under planning and construction that would connect China, Singapore and all the countries of mainland Southeast Asia.  
- The idea was formally revived in 2006 when 18 Asian and Eurasian countries signed the Trans-Asian Railway Network Agreement, which designates the Kunming-Singapore Railway as one of the Trans Asian Railways.  
- The proposed network consists of three main routes from Kunming, China to Bangkok, Thailand. |
| **ARAB MASHREQ INTERNATIONAL ROAD NETWORK** | - It is an international road network between the Arab countries of Syria, Iraq, Jordan, Palestine (Israel included), Lebanon, Kuwait, Egypt, Saudi Arabia, Bahrain, Qatar, UAE, Oman and Yemen.  
- The network is a result of the 2001 Agreement on International Roads in the Arab Mashreq, a United Nations multilateral treaty that entered into force in 2003 and has been ratified by the 13 countries for which the network serves. |
| **JAPAN–KOREA UNDERSEA TUNNEL** | - It is a proposed tunnel project to connect Japan with South Korea via an undersea tunnel crossing the Korea Strait using the strait islands of Iki and Tsushima |
CONFLICT ZONES IN ASIA

SYRIA

- Syria **borders** Turkey, Iraq, Jordan, Israel and Lebanon.
- The **highest point** in Syria is Mount Hermon (9,232 ft; 2,814 m) on the Lebanese border.
- **Lake Assad** is the largest lake in Syria.
- Al Lādhīqiyyah along with Tartus are Syria's **main ports** on the Mediterranean Sea.
- The longest and most important **river** is the Euphrates, which represents more than 80 percent of Syria's water resources.
- Syria's **population** is about 90 percent Muslim, mostly Sunni—but the Alawite minority (12 percent of Syrians) is politically dominant.
- The Syrian **Civil War** is an ongoing-armed conflict-taking place in Syria. The unrest began in the early spring of 2011 within the context of Arab Spring protests, with nationwide protests against President Bashar al-Assad's government, whose forces responded with violent crackdowns. The conflict gradually morphed from prominent protests to an armed rebellion after months of military sieges.
- There are **four main factions** of fighting groups throughout the country: Kurdish forces, ISIS, other opposition and Assad regime.
- The majority of Syrian **refugees** are living in Jordan and Lebanon.

IRAQ

- Iraq **borders** Turkey to the north, Iran to the east, Kuwait to the southeast, Saudi Arabia to the south, Jordan to the southwest, and Syria to the west.
- **Population:** Arab 75%-80%, Kurdish 15%-20%, Turkoman, Assyrian, or other 5%
- **Two major rivers**, the Tigris and Euphrates, run south through the center of Iraq and flow into the Shatt al-Arab near the Persian Gulf. The fertile region between these rivers has had many names throughout history like Al-Jazirah.
• The **desert zone** is a part of the Syrian Desert and Arabian Desert, which covers sections of Syria, Jordan, and Saudi Arabia and most of the Arabian Peninsula.

• **Iraqi coastal waters** boast a living coral reef, covering an area of 28 km² in the Persian Gulf, at the mouth of the Shatt al-Arab river

• **Iraq** is second only to Saudi Arabia in **rich oil reserves**.

• **Iraq War**, also called Second Persian Gulf War, (2003–11), conflict in Iraq that consisted of two phases. The first of these was a brief, conventionally fought war in March–April 2003, in which a combined force of troops from the United States and Great Britain invaded Iraq and rapidly defeated Iraqi military and paramilitary forces. It was followed by a longer second phase in which a U.S.-led occupation of Iraq was opposed by an insurgency.

AFGHANISTAN

• A **landlocked mountainous country**, It is bordered on the north by Turkmenistan, Uzbekistan, and Tajikistan, on the extreme northeast by China, on the east and south by Pakistan, and by Iran on the west.

• Its **longest border** is the poorly marked **Durand Line** and the shortest one, bordering China's Xinjiang province at the end of the **Wakhan Corridor**.

• **Important passes** include the Unai Pass across the Safed Koh, the Kushan and Salang Passes through the Hindu Kush, and the Khyber Pass that connects Afghanistan with Pakistan.

• The **Amu Darya** on the northern border, the country's other major river, has the next largest drainage area.

• The **northeastern Hindu Kush Mountain range**, in and around the Badakhshan Province of Afghanistan, is in a geologically active area where earthquakes may occur almost every year.

• Afghanistan is a country of **ethnic minorities**: Pashtun (38 percent), Tajik (25 percent), Hazara (19 percent), and Uzbek (6 percent).

• After the **9/11 terrorist attacks**, the United States invaded Afghanistan, removed the Taliban and chased bin Laden into the mountainous region on the border of Afghanistan and Pakistan.
YEMEN

- Yemen is an Arab country in Southwest Asia, occupying the southwestern to southern end of the Arabian Peninsula.
- It is bordered by Saudi Arabia to the north, the Red Sea to the west, the Gulf of Aden and Arabian Sea to the south, and Oman to the east.
- Yemen's territory includes more than 200 islands; the largest of these is Socotra. A number of Red Sea islands, including the Hanish Islands, Kamaran, and Perim belong to Yemen.
- Following years of dispute between Yemen and Eritrea over ownership of the Hanish Islands and fishing rights in the Red Sea, in 1999 an international arbitration panel awarded sovereignty of the islands to Yemen.
- Yemen is strategically important because it sits on the Bab al-Mandab strait, a narrow waterway linking the Red Sea with the Gulf of Aden, through which much of the world's oil shipments pass.
- Yemen is one of the poorest countries in the Arab world, due to declining oil resources.
- Ethnic Groups: Predominantly Arab, also Afro-Arab, South Asian, European
- Yemen has been in a state of political crisis since 2011. The Yemeni Civil War is an ongoing conflict that began in 2015 between two factions claiming to constitute the Yemeni government, along with their supporters and allies.
Some **other list of territorial disputes** over lands in Asia are as below:

<table>
<thead>
<tr>
<th>Territory</th>
<th>Claimants</th>
<th>Notes</th>
</tr>
</thead>
</table>
| Several areas in the Fergana Valley | Kyrgyzstan
Tajikistan
Uzbekistan | Disputed areas located between Aksai Chin and Nepal, all administered by the PRC. |
| Demchok, Chumar, Kaurik, Shipki Pass, Jadh, and Lapthal | India
People's Republic of China
Republic of China (Taiwan) | Temple complex awarded to Cambodia by an International Court of Justice ruling in 1962; "promontory" measuring 0.3 km² immediately adjacent to temple awarded to Cambodia by ICJ ruling in 2013; both countries acknowledge continuing dispute over an additional 4.3 km² immediately northwest of the 2013 ruling's area. |
| Preah Vihear Temple area (Khao Phra Wihan) | Thailand
Cambodia | |
| Paracel Islands | People's Republic of China
Republic of China (Taiwan)
Vietnam | Entirely controlled by China but claimed by Vietnam and Taiwan |
| Pratly Islands | Republic of China (Taiwan)
People's Republic of China
Vietnam
Philippines (part)
Malaysia (part) | Each of the claimant countries except Brunei controls one or more of the individual islands. |
REGIONAL GEOGRAPHY OF SOUTH-EAST ASIA

- Southeast Asia extends for more than 4,830 km from Myanmar on the west to New Guinea on the east.
- Although this region lies near the Equator, it stretches to almost 30° N in northern Burma, and a sizable part extends as far as 20° N.
- There are 2 main divisions of Southeast Asia.
  1. The mainland: Myanmar, Thailand and Indochina (comprising Laos, Kampuchea or Cambodia and Vietnam).
  2. Insular archipelago- Philippines, Malaysia, Singapore, Indonesia, and Brunei.
- Between these two parts are shallow waters that lie over the Sunda Shelf.
- For most of mainland Southeast Asia, the dominant physical features are the rugged cordilleras that splay out from the Himalayas to the north and are to the south. These mountains are underlain by an ancient crystalline mass of stable granite material.
- The north-south Mountains of mainland Southeast Asia, although physically related to the Himalayas in the north, have been heavily weathered and rounded in the tropical, rainy climate. The ranges run parallel to one another and separate the major river basins that form the core-lands of the 5 countries of mainland Southeast Asia.
- From west to east, the main ranges are the Arakan Yoma of western Burma, the Shan Highlands of eastern Myanmar and western Thailand, which extend to length of the Malay Peninsula; and the Annamite Chain of Vietnam.
- Archipelagic Southeast Asia: A string of volcanic islands stretches from Sumatra and Java, towards east to Sulawesi & the Moluccas & towards north to the Philippines. Not only is this area one of the most geologically active regions on Earth, but it is also a highly diverse land surface. A good reflection of the newer processes of landscape formation is found in the circum-Pacific belt of volcanism known as the Pacific Ring of Fire.
**RIVERS OF SE-ASIA**

1. **Irrawaddy** and its largest tributary, the Chindwin is a major river of Myanmar. Rangoon and Mandalay, the largest cities in Myanmar, are located on the banks of the Irrawaddy.

2. **Salween River** originates on the Plateau of Tibet and flows for about 1200 km through China before entering Myanmar. The delta and the flood plains of the Irrawaddy are much more extensive than those for the Salween, leaving room for the core of the country to develop.

3. The **Mekong River** flows in a valley to the east and parallel of the Salween. After leaving China, the Mekong makes the boundary between Thailand and Laos and then continues through the heart of Cambodia. It cuts across the southern tip of Vietnam, and finally empties into the **South China Sea**. The capital cities of Vientiane (Laos) & Phnom Penh (Cambodia) are located along bank of Mekong River.

4. Hanoi is on the banks of the **Red River**, and Bangkok (Thailand) is divided by the **Chao Phraya River**. The political cores and cultural hearths of all the mainland countries have developed along the rivers.

**VOLCANIC MOUNTAINS**

- Volcanic action created most of the islands, and many individual peaks heights of many of the volcanoes are active today. Southeast Asia is the **most active volcanic region** of the “Ring of Fire” that surrounds the Pacific Ocean. Examples of some volcanic eruptions are Enchanting Islands of Bali and Karakotoa. The Younger active belt of volcanism is associated with the islands of Southeast.
- The **seas between the islands** of Southeast Asia generally are quite **shallow**; most are 150 to 200 feet deep.
- At the opposite extreme are the **great ocean trenches** to the outside of the island region. The **Philippine Trench**, east of the Philippines, is a 965 km long canyon on the bottom of the ocean.
- The **Java Trench** borders the region on the south off the coasts of Sumatra and Java and another ocean deep has been recorded on the east of the **Banda Sea**.
- **Active Volcanoes** in this area are as below
  - **Sakurajima**, Japan - A major eruption could have deadly consequences for the 700,000 residents of Kagoshima, who live just miles from the Volcano.
  - **Mt. Merapi**, Indonesia - Mt. Merapi has erupted regularly since 1548 and has been active for the last 10,000 years. Experts believe that its activity led to the demise of the Hindu Kingdom of Mataram.
  - **Ulawun**, Papua New Guinea - Ulawun is one of the most active volcanoes in Papua New Guinea. Eruptions from Ulawun originate from its central crater. There have been 22 eruptions recorded at Ulawun since the 1700s.
  - **Taal Volcano**, Philippines - The Taal Volcano is a cinder cone volcano. It is located on the island of Luzon, Philippines where it lies at the middle of Lake Taal. It lies just 31 miles from Manila – the capital of the Philippines.

**DEMOGRAPHY OF SE ASIA**

- Most of Southeast Asia’s people live, often in extremely dense clusters, in scattered areas of **permanent sedentary agriculture**.
- Such area form the core regions of the various countries and stand in striking contrast to the relatively empty spaces of the adjoining districts
A superior degree of soil fertility appears to have been the main locational factor in most instances.

South East Asian countries in ascending order of population:

South East Asian countries in descending order of population:

SE Asian country with highest growth rate:
1. Philippines  2. Malaysia

SE Asian country with least growth rate:
1. Thailand  2. Vietnam

Country with highest population density:
Singapore

Country with least population density:
Laos

Ethnicity

The Malays are the most prominent ethnic group in Southeast Asia. Regional isolation and racial mixing have created differences among the countries of the region, but the people are basically Malay in origin.

The most conspicuous ethnic minority is the Chinese. The sizable minorities of "overseas Chinese" are concentrated in the urban areas of nearly every country of Southeast Asia. These are colonists from China who live in the region, and sometimes they do not even become citizens of the countries where they settle.

Indigenous hill people: Most of the indigenous tribal people of Southeast Asia are minorities within their own countries. These are the “hill people,” various tribes of which are found in each country.

In Myanmar live the Karens, the Shans, the Kachins and the Chins.

MINERAL RESOURCES

Tin

It is found in Myanmar, Indonesia, Laos, Malaysia and Thailand.

China is the world’s leading producer of tin while Malaysia is second leading producer of world. All the tin fields are in Peninsular Malaysia and the Kinta valley alone accounts for half the annual output. Tin is smelted in Penang and Singapore and ingots are exported.

Thailand’s tin is mined in the south, in the Kra Peninsula and on off shore islands such as Phuket.

Indonesia’s tin comes from islands off the northern coast of Sumatra including Bangka, Billiton and Singkep.

Petroleum

Vast supplies of petroleum also are found in Southeast Asia.

Formerly, Indonesia was one of the world’s largest petroleum producers and about one third of Indonesia’s exports were petroleum products.

Indonesia has greatly expanded oil production, most of which comes from Sumatra. The chief fields are Palembang, Jambi, Minas (near Pekan Baru), and around Pengkalan. The oil is refined at Lutong, Sarawak, or sent to Japan or Singapore.

Oil supplies nearly make the entire income of Brunei and provide the tiny country with very high standards of living. Malaysia has oilfields off shore of Sarawak and off the East Coast of Peninsular Malaysia.

Regardless of all the mineral wealth, very little heavy industry is carried on in Southeast Asia – Partly because the colonial powers did not want industry to develop and partly
because both coal and iron ore have not been found within the same country. The European powers wanted to extract the resources for their own use and sell manufactured goods back to the colonies.

- **Highways**: Highways do cross between the countries on the mainland, but they are few and poor. The Burma and Ledo roads, carved out of the jungle during World War II, are typical of road construction in the region. The Burma Road winds for 1,126 km between Lashio in Myanmar and Kunming in China’s Yunnan province. The Ledo Road covers less rugged terrain but crosses many rivers and smaller streams as it winds between Myanmar and the Assam region of India.

**INDONESIA**

- Consists of more than 17,000 islands of various sizes, about 6000 are inhabited.
- **Main islands** – Borneo (Kalimantan), Sumatra, Irian Java, Celebes (Sulawesi), Java, Madura and Bali.
- **Jakarta** is the capital city located on the Java Island.
- **Northern Borneo** is a part of Malaysia
- Indonesia’s only land frontiers are with Papua New Guinea (to the east of Irian Jaya), and with the Malaysia (states of Sarawak and Sabah) which occupy the northern Borneo.

**Physical Features**

- Islands generally have mountainous relief
- Earthquakes associated tidal waves called ‘Tsunamis’ are quite common
- Climate – Monsoon, heavy rainfall
- Very dense forests are found in most of the parts of Indonesia
- **Agriculture** – Most important Activity. Less than 50% of population is engaged in it.
- Food Crops – Rice, Maize, Cassava and Sweet potato
- **Cash Crops** – Rubber, oil palm, coffee, tea, cocoa, sugarcane and Tobacco. All cash crops are export oriented.
- **Railways** are limited to Java, Madura and Sumatra
- **River transport** is important in several areas especially in Kalimantan & Eastern Sumatra
People

- **Fourth in population** after China, India and USA
- Density of population is high in Java, Madura and Bali
- Nearly 90% of Population is Muslim
- **Bahasa Indonesia** is the **official language**

MALAYSIA

- Located North of the **Equator**
- Consist of two widely separated areas –
  1. Malay Peninsula (part of Asian Mainland).
  2. Northern part of Borneo Island.
- **Northern Borneo** has two states, Sarawak and Sabah
- **Peninsular Malaysia** separated from Sumatra Island by **Strait of Malacca** and from Sarawak and Sabah by South China Sea.
- At the tip of **Malaya Peninsula**, lies **Singapore**
- Kuala Lumpur is the capital and the largest city of Malaysia

Physical Features

- Central part of Malay Peninsula is mountainous & is surrounded by narrow coastal plains
- The **highest peak is Kinabalu**
- Climate – **Equatorial type**, high temperature and rains throughout the year
- Evergreen forests in Sarawak and Sabah are denser than that of peninsular Malaysia

Natural Resources

- **Tin, Copper & Uranium deposits** are found in Central highlands of Malay Peninsula
- **Plantation agriculture** is important activity and Malaysia has remained a leading producer of Rubber for a long time
- Road and Rail transport are better developed in Peninsular Malaysia than in Sabah and Sarawak
- **Major Seaport** of Peninsular Malaysia is Pinang (Georgetown).

REGIONAL GEOGRAPHY OF SOUTH ASIA

PAKISTAN

- The country can be divided into **two physical units** –
  1. Mountains and Plateaus in the west
  2. Indus river basin in the east is the plain region
- From **South to North** are located - Baluchistan Plateau and Mountain Ranges of Kirthar, Sulaiman and Hindu-Kush in the same order
- There are 2 **important passes** in these mountains – **Khyber Pass** in the **Hindu Kush** and **Bolan Pass** in the **Kirthar**.
- **Potwar Plateau** is located to Southeast of the Hindu Kush. Region is generally dry.
- **Climate** of Pakistan is hot & dry. Rainfall decreases from North to South. Average rainfall is 50 cm.
- Northern Mountain area is forested with broadleaved evergreen oak and chestnut. Southern part is steppe.
- Coal, Iron ore, Gold and Mineral oil are found in Baluchistan
- Mineral oil is also found in Potwar and Ghodak
- Most of the industries are located in Punjab
- **Urdu** is National language. Punjabi, Sindhi, Pushtu and Baluchi are other important regional languages.

**PoK**

- POK (Pak Occupied Kashmir) is the area, which was forcefully occupied by Pakistan in the first Kashmir war in **1947**.
- The Pak government with its capital at **Muzaffarabad** rules this region. The region has its own self-declared prime minister. This region is defined by **LOC** (Line of Control) which came into effect when truce was decreed in **Shimla Agreement of 1972**.
- The northern part of **Azad Jammu and Kashmir** encompasses the lower part of the Himalayas, including Jamgarh Peak.
- **Sarwali peak** in the Neelum Valley is the highest peak in the state.
- Monsoon floods of the Jhelum and Leepa river are common.

**CoK**

- **Aksai Chin** is one of the two main disputed border areas between China and India, the other being a part of Arunachal Pradesh.
• It is administered by China, but is also claimed by India as a part of the Ladakh region of the state of Jammu and Kashmir. In 1962, China and India fought a brief war over Aksai Chin and Arunachal Pradesh, but in 1993 and 1996, the two countries signed agreements to respect the Line of Actual Control.

• The area is largely a vast high-altitude desert with a low point (on the Karakash River). In the southwest, mountains up to 22,500 feet (6,900 m) extending southeast from the Depsang Plains form the de facto border (Line of Actual Control) between Aksai Chin and Indian-controlled Kashmir.

• In the north, the Kunlun Range separates Aksai Chin from the Tarim Basin, where the rest of Hotan County is situated.

• Aksai Chin area has number of endorheic basins with many salt or soda lakes. The major salt lakes are Surigh yil ganning kol, Tso tang, Aksai Chin Lake, Hongshan hu, etc.

NEPAL

• A small landlocked country, also known as Himalayan Kingdom

• Three Divisions:-

  1. Northern part consists of Himalayan ranges – Great Himalayas (highest range of Himalayas) run along northern border of Nepal. Mt. Everest (8848m) - world’s highest peak is located here, known as Sagarmatha in Nepalese. To the south lies the Mahabharata Range of Middle Himalayas

  2. Central Part – Occupied by Valleys – Katmandu and Pokhra

  3. Southernmost low lying plain called Terai, liable to flooding during Monsoon

• Nepal has one of the greatest hydropower generation potentials of the world. But only about 1.3% of this potential is being used.
• Traditional cottage industries constitute 60% of the industrial production.
• Tourism is the most important industry of Nepal. It is major source of earning foreign exchange.
• It imports manufactured good and exports forest and agro based products.

Nepal Earthquake

• The April 2015 Nepal earthquake was also known as the Gorkha earthquake, with a magnitude of 7.8Mw or 8.1Ms and a maximum Mercalli Intensity of IX (Violent).
• Its epicenter was east of the district of Lamjung, and its hypocenter was at a depth of approximately 8.2 km (5.1 mi). It was the worst natural disaster to strike Nepal since the 1934 Nepal–Bihar earthquake.
• The earthquake triggered an avalanche on Mount Everest and another huge avalanche in the Langtang valley.
• A major aftershock occurred on 12 May 2015 at 12:51 NST with a moment magnitude (Mw) of 7.3. The epicenter was near the Chinese border between the capital of Kathmandu and Mt Everest.
• The temblor was caused by a sudden thrust, or release of built-up stress, along the major fault line where the Indian Plate, carrying India, is slowly diving underneath the Eurasian Plate, carrying much of Europe and Asia. Kathmandu, situated on a block of crust approximately 120 km (74 miles) wide and 60 km (37 miles) long, reportedly shifted 3 m (10 ft) to the south in a matter of just 30 seconds.

Hydroelectric and Infrastructure Projects

With China
• Under China's Three Gorges International Corp, a new hydropower project has been approved to be built in Nepal. The dam is to be built on the West Seti River in northwest Nepal.
• China plans to build a 540-kilometre strategic high-speed rail link between Tibet and Nepal passing through a tunnel under Mt Everest. The rail line is expected to be completed by 2020.
• Nepal has decided to join the New Silk Road, under which Nepal would be connected to a Chinese rail line in Tibet. China recently extended its rail network from Lhasa to Xigaze (Shigatse), a city just 253 km away from China’s border with Nepal and India.

With India
• India and Nepal signed an agreement for the 900 MW Arun III dam, making India the largest hydropower developer in Nepal. Also 900 MW Upper Karnali dam in western Nepal has been signed off with India.
• The 18.6 km long Jogbani-Biratnagar (17.65 km) rail link connecting Bihar and Biratnagar in Nepal is underway. Another project connecting Jaynagar (Bihar) to Bardibas (Nepal) and extension to Bardibas is in progress.
• The Kathmandu-Tarai Fast Track Road aims to link Nirjgarh and Bara with capital Kathmandu. On completion, the road will be the shortest to link Kathmandu and India as Bara shares the border with India.
BHUTAN

- Small **landlocked** country in eastern Himalayas
- To the north and NW, it adjoins Tibet (China). To its west, south & east, it is bordered by India.
- It is almost entirely mountains. Its terrain is among the most rugged in the world.
- From level plain area in south called **duars**, the land rises steadily towards the north.
- **Highest peak of Bhutan is Gangar Punsun**
- **Chukha hydroelectric project** is built with the help of India has a generation capacity of 336 MW
- Agriculture is the most imp. economic activity and includes rearing of Yak & Sheep
- Nearly 90% of the population is dependent on agriculture and farmlands are owned by the women mostly
- Bhutan and India are mutually working on joint construction of four hydropower projects in Nepal:
  - **Under consuruction**- Chamkarchu project (largest of all), Punatsangchu-I, Punatsangchu-II and Mangdechu project
  - **Already Operational** - Chukha project, Kurichu project, Tala project
- **Mountain passes** between Bhutan and India are as follows-
  - Nathu La - It connects the Indian state of Sikkim with China's Tibet Autonomous Region.
  - Jelep La - is a high mountain pass between India and Tibet in the East Sikkim District of the Indian state of Sikkim. The Menmecho Lake lies below the Jelep La Pass.

MYANMAR

- Formerly called as **Burma**, lies to east of India and Bangladesh and to S-W of China.
• Myanmar has transferred its Capital from Yangon (Rangoon) to Pyinmana. Yangon is located on southern coast while Pyinmana is in central Myanmar.

• Structurally – three units:
  1. Young fold mountains of the west and north are the southward continuation of the Eastern Himalayas. From North to South, they are known successively as Patkai, Naga, Chin and Arkan Yoma. Altitude of Mountain Ranges decreases towards the south.
  2. Eastern Part is of upland and low hill - extend through the Shan and Kayinni Plateaus to the Southern Part.
  3. Alluvial Lowlands – running North South between mountains of the west and the upland regions of the east. Important rivers – Irrawaddy and Salween

Climate – Tropical Monsoon Type
Most of the people follow Buddhism; Urbanization is low
Mandalay is located in the interior on the bank of Ayeyarmaddy (Irrawaddy)
‘Sundari Trees’ are found in the delta regions
Rubber trees grow in hot and humid coastal regions
Teak– Most important species of Tree, alone constitute nearly 17% of country’s total export
Precious stones e.g. Sapphires, emeralds, and rubies are found on the Shan Plateau.
Pearls are found in the Gulf of Martaban
Agriculture contributes about 60% of the GDP
Rice is the major crop and occupies about 50% of all land under cultivation
Infrastructure Projects

With India

- **Kaladan multi modal project**: ensures sea connectivity to India’s Northeast and roads connecting India to ASEAN and an alternate market for Myanmar’s gas supplies. The sea link of the project is to **connect Kolkata with Sittwe**. The port of Sittwe is being developed by India.

- **Tamu-Kalewa-Kalemyo road**: to be handed over to Myanmar; nearly 71 bridges on this stretch are to be upgraded under the Trilateral Highway project. **Trilateral Highway Project**: The highway is expected to connect Moreh in India to Mae Sot in Thailand via Myanmar.

With China

- **Sino-Burma Pipelines**: A pipeline project that would allow transportation of oil and natural gas from the deep-water port of Kyaukphyu (Sittwe) in the Bay of Bengal to Kunming in China’s Yunnan province.

- **Shwe Gas Project**: The Shwe Gas Project one of the major parts of the Sino Burmese Pipeline Project. The gas field is located in the Andaman Sea. Discovered in 2004 it began production in 2013.

- **Myitsone Dam**: The Myitsone Dam which literally translates Confluence Dam is a major hydroelectric power project which is located at the confluence of the Mali and N’Mai rivers and the source of the Irawaddy River.

BANGLADESH

- Formerly called ‘East Pakistan’, became **independent in 1971**
- Bordered by India from three sides – West, north and east. Myanmar lies to its southeast. Bay of Bengal is to its south.

Physical Features

- Almost all of it lies in the Ganga-Brahmaputra delta. These are alluvial plains.
- Southeast part of Bangladesh is hilly. The Chittagong Hills, in fact, are continuation of the hill ranges of Myanmar.
- **Cox’s bazaar** – located on the eastern coast of Bangladesh is the largest Sandy-beach in the world.
- **Brahmaputra** is called ‘Jamuna’ in Bangladesh and after meeting Ganga, the joint stream is called **Padma**.
- Other rivers are the Meghna, Surma and Karnaphuli
- Climate is of Tropical Monsoon Type
- Deltaic coast has mangrove forests containing ‘Sundari’ trees. Wood is used for making boats.
- **Natural gas** is found in Comilla and Sylhet districts
- Rice and Jute are the major crops
- It has a small manufacturing sector. Most of the industries are small scale and cottage industries.
- Dhaka, Chandpur, Barisal and Khulna are inland ports
- It has highest density of Population in South Asia

Indo – Bangladesh Land Swapping

- The India–Bangladesh enclaves were the **enclaves along the Bangladesh–India border**, in Bangladesh and the Indian states of West Bengal, Tripura, Assam and Meghalaya.
- The prime ministers of India and Bangladesh signed the **Land Boundary Agreement in 1974** to exchange enclaves and simplify their international border. A revised version of the
agreement was adopted by the two countries in May 2015, when the Parliament of India passed the **100th Amendment** to the Indian Constitution.

- Under this agreement, India received **51 Bangladeshi enclaves** (covering 7,110 acres (2,880 ha)) in the Indian mainland, while Bangladesh received **111 Indian enclaves** (covering 17,160 acres (6,940 ha)) in the Bangladeshi mainland.
- After the Land Boundary Agreement, India lost around 40 km² (10,000 acres) to Bangladesh.
- **Tin Bigha Border** is a strip of land belonging to India on the West Bengal–Bangladesh border. The corridor, which connects **Dahagram-Angarpota** (Bangladesh) with the mainland Bangladesh (Patgram) as well as Kuchilibari (India) with Mekliganj town, has turned into a veritable crossroads of friendship and harmony between India and Bangladesh.

**South Talpatti or New Moore Island**

- South Talpatti or New Moore, was a **small uninhabited offshore sandbar landform** in the Bay of Bengal, off the coast of the Ganges-Brahmaputra Delta region.
- The island was situated only two kilometers from the mouth of the **Hariabhanga River**.
- The island was claimed by both Bangladesh and India, based on a case filed by the Government of Bangladesh in 2009 at the Permanent Court of Arbitration the dispute was settled in 2014 by a final verdict not open to appeal and in **favour of Bangladesh**.

**SRI LANKA**

- **Separated from India by Gulf of Mannar and the Palk Strait**
- Almost the entire Sri Lanka, except Jaffna Peninsula in the north and coastal strip in the Northwest is made of hard rocks.
- South – Central part is the highest land.
- **Mahaveli Ganga** is the **longest river** which flows northeast and meets the Bay of Bengal.
- It has hot and humid climate.
- **Rainfall divides country in two zones** –
  1. **Wet Zone** – Southwest of island receives rainfall from both southwest and northeast monsoons.
  2. **Dry Zone** – Northern and Eastern parts receive rainfall only from Northeast monsoon; inadequate thus falls in the dry zone.
- **Agriculture** – Most important activity. Rice is the major food crop.
Tea, rubber and coconut are principal cash crops. Cocoa and Spices are grown for export.

Graphite and gemstones are Sri Lanka’s most valuable mineral products.

**Sea Ports** – Trincomalee (Eastern Coast) and Colombo (Western Coast).

Kandy is a modern city and is famous Buddhist temple.

Sinhalese and Buddhists are the major groups, they speak Sinhalese. Other major group is of Tamils from India, settled in the northern and eastern parts of Sri Lanka.

**Sethusamudram Shipping Canal Project** is a proposed project to create a shipping route in the shallow straits between India and Sri Lanka. This would provide a continuously navigable sea route around the Indian Peninsula. The channel would be dredged in the Sethusamudram Sea between Tamil Nadu and Sri Lanka, passing through the limestone shoals of Adam’s Bridge. The proposed route through the shoals of Adam’s Bridge is opposed by some groups on religious, environmental and economical grounds.

**REGIONAL GEOGRAPHY OF EAST ASIA**

**CHINA**

- World’s most populous country (one-fifth of the world population). In area, China is third largest.
- Large part of China is mountainous and arid, thus it has one of the smallest areas of cultivable land per person in the world.
- Intensive agriculture and horticulture is practiced, yield per hectare is high.
- **Rice** is the main crop, grown in southern and central China.
- Silk, cotton, tobacco and tea are important cash crops.
- **Shanghai is the largest city** of China. It is the largest port and a big textile centre.
- Most provinces of North China have coalfields, and Iron ore deposits are abundant in the anthracite fields of Hebei, Shanxi and Shandong.
- Nearly 70% of the energy is produced from coal. China is 2nd largest consumer of energy after USA.
- Loess Plateau is made of fine yellow sand called loess.
- Towards east lies the river valleys of Huang He, Chang Jiang and Xi Jiang interspersed with hills.
- Salween and Mekong originate from the eastern part of the plateau of Tibet, they flow into Southeast Asia.
- **Valley of Chang Jiang** is the largest.

**Physiography and Relief**

China consists in broad terms of 3 physiographical divisions:

1. **The Western Highlands**: The lofty mountains in the far west, bordering Szechuan and Yunnan are known as the Szechuanese Alps or Great Snowy Mountains and towering up to heights in excess of 4500 m culminate in Minya Gongkar, 7660 m; from these mountains great plateau and mountain spurs project eastwards, the most important being the separate northern from central China.
2. **The Eastern Uplands**: The uplands in the east margining the sea which though once probably connected together now form a series of detached massifs, the Liaotung, Shantung and Chekiang–Fukien Uplands, all of which are broken and much denuded.
3 The Lowlands: In between the Western highlands and the Eastern Uplands lie a series of depressions forming the lowlands. These lowlands comprise the Great Plain Of North China and the Middle Yangtze Basin.

Drainage

China is a region of dense stream network

- One of the contrasts that characterize China’s physical environment lies in the abundance of water and the dense hydrographic network of the eastern regions as compared with the great aridity of the western region, where surface flows generally toward the exterior,
- The desert regions of the Gobi, the Qaidam basin, part of Dzungaria and the Takla Makan Region are devoid of any constantly flowing streams.
- The great Chinese rivers, the Hwang Ho and the Chang Jiang, descend from Tibet.
- Hwang Ho: Before the plains, the Hwang Ho passes through the Loess Plateau at the foot of the Qilian Shan range in Ganshu and Shanxi provinces. Here the river has dug deep ravines and carried downstream appreciable quantities of silt. Its irregular now, however, gives rise to unexpected and disastrous silting, often causing the course of its bed to be altered.
- Yangtze Kiang River: The largest river of China flows in the middle part of eastern China and drains into the East China Sea. Shanghai is located on the back of this river.
- Si Kiang: Rises in the eastern part of Yunnan Plateau flows through the southernmost part of China. It drains into South China Sea and its mouth is located near canton.

<table>
<thead>
<tr>
<th>Major Rivers of China</th>
<th>Drains into</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yangtze Kiang</td>
<td>East China Sea</td>
</tr>
<tr>
<td>Hwang Ho or Yellow River</td>
<td>Yellow Sea</td>
</tr>
<tr>
<td>Si Kiang</td>
<td>South China Sea</td>
</tr>
</tbody>
</table>

- The Yun Ho (Grand) Canal connects the Hwang Ho and Chang Jiang (Yangtze Kiang) rivers and runs northward to Beijing. It is the main inland waterway of China. Besides the complex network of canals that connect with the rivers, eastern China also has a number of lakes that are part of the inland waterway system.

Natural Lakes of China

- Because of its morphology, China has a considerable number of natural lakes, remnants in many cases of older, more extensive basins, such as those located in the alluvial depressions traversed by the Yangtze Kiang (Chang Jiang).
- They are also common in the interior areas of western China, where they frequently have a seasonal or permanently brackish character owing to the intense evaporation (Lop Nor in Xinijiang and Qinghai, or Koko Nor, amid the ranges of the Nan Shan).

Population

- The result of the geographical contrast between east and west is that if a line is drawn from Yunnan province in the south west to Heilungkiang province in the north east (in Manchuria) it is found that about 96% of the population of China live on the 58% of the land to the east of the line.
The only areas of moderately dense population to the west are where irrigation and lines of communication exist, as along the Kansu corridor or upper Hwang Ho.

In 1990, 23% of the world’s population lived in China over 90% of these belonged to the dominant Han people the remainder comprise 56 small minority groups.

By 1979, the government, in order to control the population growth, started giving inducements for restricting to one child per family.

In 1987 the government began to relax its rigid policy in response to intermittent outrage about cases of coercion and brutality in implementing population goals. In urban areas, there is still the minimum age for marriage and restricts families to one child. However, a second child is allowed in rural areas if the firstborn is a girl and providing there is a 4 years gap between births.

China’s family size had fallen from 5.8 to 2.4 in 20 years, the figure is 1.7 in urban areas (better education, stronger state control), compared with 2.7 in rural areas.

One Child Policy is a population control policy of the People's Republic of China. The policy is enforced at the provincial level through fines that are imposed based on the income of the family and other factors. The policy was introduced in 1978 to alleviate social, economic and environmental problems in China. Since implementation in 1979, the one-child policy had many impact on China’s demography:

1. It reduced China’s population by an estimated 400 million people. In addition to creating a gender imbalance, numerically favoring men over women, the policy also skewed the age demographic.
2. Economists estimate that China’s elderly population will increase 60 percent by 2020, even as the working-age population decreases by nearly 35 percent. This type of demographic shift is unprecedented and presents serious challenges to the economic health of the nation.
3. The one-child policy has had several unintended consequences, including a dearth of workers, a reduced female population due to gendercide, and fewer young people to take care of a quickly aging population.
4. Moreover, the policy has created conditions conducive to a severe regional human-trafficking and human-smuggling epidemic to compensate for the lack of Chinese women. It has already facilitated the practice of mail-order brides and created a burgeoning illegal-adoption market.

Agriculture

There are 4 distinct production regions:

- The Hwang Ho Plain: Essentially a large alluvial plain created by the Hwang Ho River. It is the heartland of Chinese civilization. This lowland area has been under intense cultivation for centuries. The major crops produced are wheat, barley, corn, millet, and cotton. The region also produced most of China’s apples, and hogs are found nearly everywhere.

- Loess hills of Northern China: To the west of the Hwang Ho Plain lie the loess hills of Northern China. This region of wind-blown soil has been dissected by thousands of gullies, but the flat areas between the miniature canyons are farmed intensively.

- The Chang Jiang drainage basin: The third major farming region of China is the rice-producing area. Rice is the major crop along the river from the Szechwan Basin to Shanghai. The region has also been noted for the production of silk and tea. Mulberry trees for feeding silk worms are still common, although the silk industry has declined.

- South China: It is the poorest of the four major agricultural regions. The plain surrounding Canton is not large, and the rolling hills give way quickly to non-arable mountains.
JAPAN

- It is called as ‘Nippon’ in Japanese which means ‘land of the rising sun’
- It has 3,900 islands but 4 are large and important
- In order of their size they are – Honshu, Hokkaido, Kyushu and Shikoku.
- Archipelago forms an arc. Sea of Japan separates it from mainland Asia
- Mountainous area. Mountains account for 72% of Japan’s total land area. Most of the mountains are of volcanic origin. Mt. Fujiyama near Tokyo is a famous mountain; it has not erupted since 1707. However it is still considered as an active volcano.
- Recreational resorts have hot-springs
- Japan lies at the margins of converging Pacific Plate and Eurasian Plate. Therefore earthquakes are frequent here.
- Lowland area – Kanto Plain, where lies the cities of Tokyo and Yokohama.
- Nagoya is also known as ‘Detroit of Japan’ owing to its automobile industry

Climate

- Mild and varies from place to place. Northern part is colder than the south.
- Winds from Siberia dominate the winter weather and causes heavy snow and rain in the northern and western parts of the country.
- In summers, oceanic winds cause rainfall on eastern and southern parts of Japan
- During September, violent rain-storms originating in Philippines Sea or in the neighborhood of Caroline Islands called Typhoons strike the Southern part of Japan frequently.
- Plentiful rainfall and temperate climate produces rich forests and luxurious vegetation that cover the entire countryside.
- Cold ocean current (Oya Shio) from north and the warm ocean current (Kuro Shio) from the south meet on the eastern coasts of Japan. This causes thick fog and creates ideal condition for fish to thrive. This area is therefore, one of the major fishing grounds of the world (2nd largest). It contributes nearly 15% to the total fishing of the world.

Natural Resources

- Japan’s main mineral resource is coal, which is of low grade. Hence basic minerals such as mineral oil, iron-ore, coking coal, and non-ferrous metal ores such as copper, nickel and bauxite have to be imported.
- It depends on overseas sources to meet roughly 85% of energy requirements
- Japan is poorly endowed with other natural resources also.
- Despite these limitations, Japan has emerged as a leading industrial nation of the world owing to highly developed human resources.
- Japan’s major exports are automobiles, steel, ships, various kinds of machines and electronic goods.

Agriculture

- Only 14% of total land of Japan is arable
- Farms are small in size but are intensively cultivated
- Only 7% of population is engaged in agriculture
- Rice is the main crop. Wheat, barley and soyabeans are other important food crops.
- Nearly two third of the total area of Japan is forested
Industry

- Japan has seen phenomenal industrial development. Many factors contributed to this phenomenal development.
- Japan has developed hydro-electric power as supplement of coal.
- The indented coastline has facilitated the development of many large ports, which helped import large quantities of raw materials from all over the world.
- Some of the raw materials like copper, manganese, as well as silk, kaolin and timber have been fully utilized.
- Nearness of Japan to the densely populated continent of Asia provides a big readymade market.
- The high density of population of Japan has proved a boon for the industrial development. Not only the labour is cheap, it is skilled as well.
- The extent of government encouragement can be imagined by the fact that apart from encouraging the industrialists, it has formulated a technically biased educational system.
- Other factors have been generous aid from the U.S.A. in post World War II period, the competitiveness of Japanese industries, technological innovations.
- There are 4 important industrial regions in Japan. They are- the Kwanto Plain, the Kinki Plain, the Nagoya region, and Northern Kyushu.

1. **Kwanto Plain:** The Kwanto Plain has attracted the largest urban agglomeration in Japan and in the world and contributes about 30% of nation’s industrial output. It is the largest plain of Japan and provides ideal sites for setting up of industries. In this plain, Tokyo grew originally as a political capital and Yokohama developed as the area’s main seaport.

<table>
<thead>
<tr>
<th>Centres</th>
<th>Important Industries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tokyo</td>
<td>Electrical engineering industries like television sets, refrigerators,</td>
</tr>
<tr>
<td></td>
<td>computers.</td>
</tr>
<tr>
<td>Yokohama</td>
<td>Engineering, shipbuilding, oil refining, petrochemicals &amp; port industries</td>
</tr>
<tr>
<td>Kawasaki</td>
<td>Marine engineering, cement works and glass works</td>
</tr>
<tr>
<td>Chiba</td>
<td>Integrated iron and steel works</td>
</tr>
</tbody>
</table>

2. **Kinki Plain:** Japan’s 2nd largest urban agglomeration & industrial concentration is the Kinki Plain at the head of the Osaka Bay. The 3 important cities- Osaka, Kobe, and Kyoto- together contribute about 20% of the country’s industrial output. The local power supplies are inadequate and the region obtains coal form north Kyushu, Hokkaido and abroad.

<table>
<thead>
<tr>
<th>Centres</th>
<th>Important industries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osaka</td>
<td>Textiles, plastics, footwear and textile machinery</td>
</tr>
<tr>
<td>Kobe</td>
<td>Shipbuilding, oil refining and petrochemical industries</td>
</tr>
<tr>
<td>Kyoto</td>
<td>Traditional handicrafts, oriental porcelain, toy lacquer works</td>
</tr>
</tbody>
</table>

3. **Nagoya:** A huge metropolis, Nagoya, has developed as an important industrial centre, on the Nobi Plain at the head of the Isa Bay.

4. **Northern Kyushu:** On Northern Kyushu are the Kitakyushu (a collective name for several cities including Yawata, Kokura, and Moji) and Fukuoko agglomerations. Here heavy industries have developed on or near the Chikugo coalfield. It produces steel,
ships machine parts, chemicals and textiles. Nagasaki is also an important industrial centre in the region. Other industrial towns are Hakodate and Sapporo in Hokkaido.

<table>
<thead>
<tr>
<th>Centres</th>
<th>Important Industries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muroran</td>
<td>Iron and steel industry</td>
</tr>
<tr>
<td>Akita</td>
<td>Oil refinery</td>
</tr>
<tr>
<td>Niigata</td>
<td>Oil refinery</td>
</tr>
<tr>
<td>Hiroshima</td>
<td>Engineering industry</td>
</tr>
<tr>
<td>Kure</td>
<td>Shipbuilding</td>
</tr>
<tr>
<td>Okayama</td>
<td>Textiles industry</td>
</tr>
</tbody>
</table>

Other Facts about Japan

- Japan has both national and private railroad systems. The national railroad is devoted mostly to carrying freight, while the private railroads carry mostly passengers.
- Tokyo is by far the largest Japanese city; the urban area of Tokyo merges into two other millionaire cities of Japan. Kawasaki and its near neighbor, Yokohama, is Japan’s second largest.
- The Tokyo-Yokohama conurbation contains more than 10% of the people of the entire country.
- Disputed islands with China- The Senkaku Islands (Diaoyu Islands) are a group of uninhabited islands controlled by Japan in the East China Sea. They are located roughly due east of Mainland China, northeast of Taiwan, west of Okinawa Island, and north of the southwestern end of the Ryukyu Islands. The islands are disputed between China and Japan and between Japan and Taiwan

People

- Ranks 10th in the world vis-à-vis its population size
- It is one of the most densely populated country
- One of the most urbanized nation of the world. More than 60% of the population is concentrated in the major metropolitan areas of Tokyo, Yokohama, Osaka, Nagoya and Kitakyushu.
- Equal rights to women were granted in 1947 and women are the major participants in the development of the nation

Forest Resources

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>LAND UNDER FOREST</th>
</tr>
</thead>
<tbody>
<tr>
<td>S. Korea</td>
<td>64%</td>
</tr>
<tr>
<td>North Korea</td>
<td>63.25%</td>
</tr>
<tr>
<td>Japan</td>
<td>67%</td>
</tr>
<tr>
<td>China</td>
<td>18%</td>
</tr>
<tr>
<td>Mongolia</td>
<td>7%</td>
</tr>
</tbody>
</table>
REGIONAL GEOGRAPHY OF SOUTH-WEST ASIA

MAIN PHYSIOGRAPHIC FEATURES

- The South-West Asia consists of the countries of Iran, Iraq, Syria, Saudi Arabia, Oman, Yemen, Jordan, Israel and Turkey.
- The main physiographic features include the Armenian Plateau (between Caspian and Black Sea), Taurus, Pontic Mountains, Zagros and Elburz Mountains.
- Another major feature is the deserts of SW Asia. These include:
  - Arabian Desert, which is the continuation of the Sahara Desert covering an area of about 2.6 million km² of Arabian Peninsula. Its one-third area is covered with sand dunes, highest in the world.
  - Iranian Desert: the second largest

DRAINAGE

The Tigris and Euphrates

- The Tigris and Euphrates rivers flow through Mesopotamia and the lowland area in Iraq that some consider being the birthplace of civilization.
- Babylon, the world’s first large city, was located along the Euphrates in the centre of Mesopotamia.
- The two rivers begin in the mountains of Turkey and flow roughly parallel to each other toward the southeast.
- The Euphrates cuts through Syria, both rivers flow through Iraq and they eventually empty into the Persian Gulf.
- The Tigris is actually a tributary of the Euphrates.
- The land of the Tigris and Euphrates has always been fertile and productive and with the economic property this region is known as ‘Fertile Crescent’.
- The lower part of the river has been used as the international boundary between Iraq and Iran, the two countries. Baghdad, the capital and largest city of Iraq is located on the banks of the Tigris River.

The Jordan River

- The Jordan River, which is only 240 km, is one of the world’s best known rivers because of its location in the Holy land and significance for Christianity.
- Essentially, the river flows from the Sea of Galilee southward into the Dead Sea.
- The surface of the Dead Sea lies 375 below mean sea level and the lowest place on earth.

IRAQ

Covered above with Map

IRAN

- The country is bordered to the northwest by Armenia and Azerbaijan; with Kazakhstan and Russia across the Caspian Sea; to the northeast by Turkmenistan; to the east by Afghanistan and Pakistan; to the south by the Persian Gulf and the Gulf of Oman; and to the west by Turkey and Iraq
- It is the only country that has both a Caspian Sea and an Indian Ocean coastline
• Iran has long been of geostrategic importance because of its central location in Eurasia and Western Asia, and its proximity to the Strait of Hormuz.

• The eastern part consists mostly of desert basins such as the Dasht-e Kavir, Iran's largest desert. The Elburz Mountains in the north rise to 18,603 ft (5,670 m) at Mount Damavend.

• Iran is a major regional and middle power, exerting considerable influence in international energy security and the world economy through its large reserves of fossil fuels, which include the largest natural gas supply in the world and the fourth-largest proven oil reserves.

• Ethnic Groups: Persian 61%, Azeri 16%, Kurd 10%, Lur 6%, Baloch 2%, Arab 2%, Turkmen and Turkic tribes 2%, other 1%

SYRIA

Covered above with Map

SAUDI ARABIA

• Saudi Arabia is geographically the second-largest state in the Arab world after Algeria.

• Saudi Arabia is bordered by Jordan and Iraq to the north, Kuwait to the northeast, Qatar, Bahrain, and the United Arab Emirates to the east, Oman to the southeast, and Yemen to the south.

• It is the only nation with both a Red Sea coast and a Persian Gulf coast, and most of its terrain consists of arid inhospitable desert or barren landforms.

• Saudi Arabia occupies about 80% of the Arabian Peninsula (the world's largest peninsula).

• There are virtually no rivers or lakes in the country, but wadis are numerous. The few fertile areas are to be found in the alluvial deposits in wadis, basins, and oases.
• Saudi Arabia is the **world's largest oil producer and largest exporter**, and controls the world's **second largest hydrocarbon reserves**.

• The **ethnic composition** of Saudi citizens is 90% Arab and 10% Afro-Asian. Most Saudis live in Hejaz (35%), Najd (28%), and the Eastern Province (15%).

---

**YEMEN**

Covered above with Map

**OMAN**

• Holding a strategically important position at the mouth of the Persian Gulf, the nation is **bordered by** the United Arab Emirates to the northwest, Saudi Arabia to the west and Yemen to the southwest, and shares marine borders with Iran and Pakistan.

• The **coast** is formed by the Arabian Sea on the southeast and the Gulf of Oman on the northeast.

• The **Madha and Musandam exclaves** are surrounded by the UAE on their land borders, with the Strait of Hormuz and Gulf of Oman forming Musandam's coastal boundaries.

• **Tourism** is the fastest-growing industry in Oman.

• **Omani people** are predominantly Arab, Baluchi, South Asian (Indian, Pakistani, Sri Lankan, Bangladeshi), and African ethnic groups

**JORDAN**

• Jordan is **bordered by** Saudi Arabia to the south and east, Iraq to the north-east, Syria to the north, and Israel and Palestine to the west.
• Jordan is **landlocked** except at its southern extremity, where nearly 26 kilometres (16 mi) of shoreline along the Gulf of Aqaba provide access to the Red Sea.
• The **Jordan Rift Valley** of the Jordan River separates Jordan from Israel and the Palestinian Territories. The highest point in the country is Jabal Umm al Dami.
• The **Jordan River** is short, before reaching Jordanian territory the river forms the Sea of Galilee.
• Jordan is classified by the World Bank as a country of "upper-middle income".
• **Phosphate mines** in the south have made Jordan one of the largest producers and exporters of this mineral in the world.
• The vast majority of **Jordanians** are Arabs, accounting for 95–97% of the population.

**ISRAEL**

• Israel is a country in West Asia, situated at the **southeastern shore of the Mediterranean Sea** and the northern shore of the Gulf of Aqaba in the Red Sea.
• It **shares land borders** with Lebanon to the north, Syria in the northeast, Jordan on the east, the Palestinian territories (which are claimed by the State of Palestine and are partially controlled by Israel) comprising the **West Bank and Gaza Strip** to the east and west, respectively, and Egypt to the southwest.
• Israeli **sovereignty over Jerusalem** is internationally disputed.
• The **Jordan River** runs along the Jordan Rift Valley, from Mount Hermon through the Hulah Valley and the Sea of Galilee to the Dead Sea, the lowest point on the surface of the Earth.
• The Jordan Rift Valley is the result of tectonic movements within the **Dead Sea Transform** (DSF) fault system.
• Israel is considered the **most advanced country in Southwest Asia** and the Middle East in economic and industrial development.
Israel is a global leader in water conservation and geothermal energy, and its development of cutting-edge technologies in software, communications.

- 74.9% population are Jews and 20.7% of the population comprised of Arabs.

Turkey is bordered by eight countries: Syria and Iraq to the south; Iran, Armenia, and the Azerbaijani exclave of Nakhchivan to the east; Georgia to the northeast; Bulgaria to the northwest; and Greece to the west.

- The Black Sea is to the north, the Mediterranean Sea to the south, and the Aegean Sea to the west.
- The Bosphorus, the Sea of Marmara, and the Dardanelles demarcate the boundary between Thrace and Anatolia; they also separate Europe and Asia.
- Turkey's location at the crossroads of Europe and Asia makes it a country of significant geostrategic importance.
- Turkey has a sizeable automotive industry.
• The majority of the **Turkish population** are of Turkish ethnicity. They are estimated at 70–75 percent
• The **three "Non-Muslim" minority groups** claimed to be officially recognized in the Treaty of Lausanne are Armenians, Greeks and Jews.
GEOGRAPHY THEORY
ATMOSPHERE AND ITS TEMPERATURE

LAYERS OF ATMOSPHERE

Troposphere
- Layer immediately above the surface of earth & the most important.
- Height varies from 8 Km at poles to 18 Km at equator and height is more in summer
- Here temperature decreases with height at the rate of 1 degree for each 165 m rise. This is called normal lapse rate. At poles, it is -45°C while at equator; it is -80°C. It is a paradox that lowest temperature in the atmosphere lies above equator & not poles.
- Densest part of Atmosphere. All dust particles and water vapours of Atmosphere are found here, hence weather phenomenon.
- Mountains, hot air balloon etc are limited to this layer.
- Jet aeroplanes avoid this layer due to presence of bumpy air pockets & fly in Stratosphere.

Stratosphere
- Layer immediately above Troposphere, separated from it by tropopause.
- Extends upto **50 Km**, temperature rises with height here.
- **Ozone** layer is concentrated over here.
- **Clouds**, water vapour and dust are absent here.
- **Shooting Star**, Weather balloon.

**Mesosphere**

- Extends upto **80 Km** wherein temperature decreases with height (-100°C)

**Thermosphere**

- Contains *electrically charged* layer **Ionosphere. Space Shuttle, Satellite** Aurora lie here.
- **Radio waves** transmitted from earth are reflected back by this layer.
- Temperature here increases with height due to radiation from sun.
- Upper part of it is called **exosphere**, which is highly rarefied.

**INSOLATION**

- It is the amount of **Solar Radiation** received by the earth.
- The atmosphere is heated mainly from below by the heated surface of the earth. That is why the temperature in lower parts of atmosphere is usually higher.
- Atmosphere is heated more by terrestrial radiation than by incoming solar radiation.
- Factors that influence insolation are the Angle of sun’s ray and the duration of a day.
- At Noon, sunrays strike earth’s surface vertically, therefore, more heat. At morning and evening, it strikes obliquely. Heating effect of vertical rays is more than that of oblique ones.
- The sun’s rays are almost vertical in lower latitudes. At poles, rays are more oblique.
- The amount of Insolation during summer is more than it is in winters.
• Temperature of Air Decreases with:
  1. Increase in latitudes. As we go away from equator, it is cooler.
  2. Height or Altitudes.
  3. Temperature is also influenced by distance of a place from sea. Maritime places having equable temperature during winters and summer. While continental places have extremes of temperature.

Temrature Contrasts On Land

• **Land heats more rapidly** and to higher temperatures than water, and **cools more rapidly** and to lower temperatures than water.

• Reasons for the differential heating of land and water include the following:
  - **water is a liquid** and is mixed by waves and currents, while soil or rock are fixed; hence, heat is distributed through a **larger thickness** (mass) of water than land;
  - **land is opaque**, so all radiant energy is absorbed in a shallow surface layer, while water is more transparent, allowing solar radiation to penetrate to greater depths;
  - the **specific heat of water is higher** than the specific heat of land; and
  - **Evaporation is greater** from a water surface than that from a land surface.

• The atmosphere is heated chiefly by radiation from Earth’s surface. Therefore, to understand variations in air temperatures, we must understand the **heating properties of various surfaces**.

• The annual **temperature range near the equator is very low**. With an increase in latitude, the annual temperature range **increases**.

• Reasons for the low annual range in the tropics include the following:
  - this region always has a fairly high noon-Sun angle (lowest noon-Sun angle at 0° is 66 1/2°) and
  - The tropics have more uniform lengths of daylight throughout the year.

• Places in the **middle and high latitudes**, however, have much **greater seasonal variations** in Sun angle and length of daylight, causing these locations to have much **greater annual temperature ranges**.

• The city along the windward coast will experience a relatively small annual temperature range because of strong marine influence.

• **The interior city will have the highest annual range** among the three cities because of its continental position.

• Because the winds are directed from the land toward the ocean, the city located along the leeward coast will **not experience a strong marine influence** and therefore will have an annual temperature range that is more similar to that of the interior city.

ATMOSPHERIC PRESSURE AND WINDS

**Equator Low**

• Temperature is high throughout year near equator. As a result lower layers get heated up and air rises to create low pressure zone.

• Extends between **10° N&S**, characterized by extreme calm conditions called **Doldrums**.

**Polar High**

• They are cold throughout year, subsidence of air takes place. Therefore Polar Highs.
**Sub Polar Low**

- Located between 45° N&S of Arctic & Antarctic Circles.
- Here winds from polar and sub-tropical high pressure belts meet & rise up, creating low conditions.
- Due to high contrast in temperature between the two winds, **cyclonic conditions** are created in this zone.

**Subtropical High**

- Rising air at equator cools down after reaching upper parts. The air starts sinking near 30°N, 30°S and piles up there. That is why world’s **tropical deserts** are located here.
- Characterized by **calm conditions** with variable and feeble winds.
- Also known as **Horse Latitudes**.
- From Sub-Tropical High to **Equatorial Low**, blow extremely steady winds called **Trade Winds**. Due to **Coriolis force**, these winds are deflected to right in the Northern Hemisphere and to left in the Southern Hemisphere.
- From Sub-Tropical High to **sub-Polar low**, blow the **Westerlies**. The Westerlies of **southern hemisphere** are **stronger** and more constant in direction because of the huge expense of water. These are best developed between 40°S to 65°S, therefore called as **Roaring Forties, Furious Fifties and Shrieking Sixties**.
Periodic and Local Winds

- **Monsoon Winds** are those winds, which reverse their direction with the change in season. Blow from Land to Sea in winter and Sea to Land in summer. Weak Monsoons exist over South West USA, Australia, South America, China, Japan and Parts of Africa.

- **Katabatic Wind** - During winters, areas adjacent to highland experience a local cold wind called katabatic wind (moving down from snowcapped mountains to valley). Very cold and dry e.g. Mistral over France from Alps flows through Rhone Valley towards Mediterranean Sea. It brings temperature below freezing.

- **Foehn** (in Alps) and **Chinook** (in USA & Canada in Rockies) are other local winds of importance, which blow down the mountains and get warm up. In the process, these melt the snow and hasten ripening of grapes (in Alps) and benefit ranchers in Rockies. Chinook is also called snow-eater.

- Local Wind in India – Loo (hot, dry and dusty wind)

**WATER IN THE AIR**

- Water vapours are present in large amount in low latitudes and over oceans. These are less over polar areas and land. Water vapour content varies with seasons & altitudes as well.

- **Evaporation** – Highest during hot dry and windy conditions and lowest during cool, moist and calm weathers.

- **Humidity** is the amount of water vapour present in Air.

- When the air holds the maximum amount of water vapours it can carry at a given temperature, it is called saturated.

- Unsaturated air may become saturated if cooled. The phenomenon of rain, snow etc. happens due to same reason as it goes up.
• **Dew Point** is the temperature at which air gets saturated. At dew point, water vapour changes into minute droplets of water or ice crystals. This is called **condensation**.

• **Dust** in the atmosphere serves as surfaces for condensation, known as **condensation nuclear**.

**Forms of Condensation**

- **Dew**: In cold, clear nights when comparatively warm, moist air comes in contact with cold objects, it cools down. The excess of moisture condenses into droplets of water called Dew. Frozen dew is called **Frost**.

- **Clouds**: The visible aggregates of minute droplets of water or ice crystals are known as clouds. These are of major 10 types:
  - **Low** Clouds (<2000m height): Stratocumulus, Stratus, Nimbostratus, Cumulus and Cumulonimbus.
  - **Medium** Clouds (2000-6000 m): Altocumulus and Altostratus
  - **High** Clouds (6000-12000 m): Cirrus, Cirrostratus and Cirrocumulus
  - **Cirrus** clouds are composed of ice crystals and give a fibrous & feathery appearance.
  - **Cumulus** clouds have a flat base & dome shaped/ cauliflower structure.
  - **Stratus** clouds are like sheets.

- **Fog**: is the cloud very near to the surface of earth. Created because of the cooling of air adjacent to the cold ground.

- Falling of this solid and liquid water on earth’s surface is called **Precipitation** e.g. Rain, Snow, Hail.

- In calm air, the drops are very small called **Drizzle**.

- When condensation in air takes places at a temperature below freezing point, the water vapour changes into tiny ice crystals or flakes called **snowfall**.

- Sometimes powerful air currents may lift raindrops to a greater height, where temperature is below freezing point. Rain drops freezes. Currents may toss those frozen drops up again. The coating of water is frozen in concentric layer. This process repeated so many times and fall as **Hailstones**.

- At Equators, when land is heated, air is also heated & rises up. If moist, increase in height leads to cooling of air and its condensation, and therefore heavy rainfall.

- At Mid Latitudes, when wind blows from all sides towards centre of Low Pressure, they have spiral motion of air. If air has moisture, sudden uplifting of warm air may lead to rainfall.

- **Weather** is the state of Atmosphere at any given place and time, while **Climate** is the average weather of a place over a period of 30-35 years or more.

- **Mercury** or **Alcohol** (at cold places like Russia) is used in **Thermometers**.

- **Six’s Max And Min Thermometer** – Used to find out maximum and minimum temperature of a place within 24 hr. Thermograph s the instrument that continuously records temperature.

- **Barometer/ Aneroid Barometer** (without liquid) is used to measure atmospheric pressure (in millibars). **Anemometer** is used to find wind speed (km/hr). Anemograph records wind speed automatically.
Man-nature interaction has yet another face where nature dominates over man as in the case of environmental hazards like cyclones. Though man has a little control over these natural processes, an understanding of these forces gives man a chance of exerting at least some limited control and make living condition safer. Tropical cyclones are the low-pressure high velocity wind systems originating within the tropics over the oceans. After their formation, these move towards land areas and cause high hue and cry.

**Causes**

Ideal Conditions for formation of cyclones are high temperature, quite air and highly saturated atmosphere. These conditions prevail as:

- **a)** High Temperature - Tropics: 27º C
- **b)** Quite Air - Equitorial doldrums
- **c)** Highly saturated atmosphere - Western margins of oceans

These conditions exist in Equitorial doldrums along the western margins of the oceans. Here **warm currents** supply abundance of moisture and saturate the air above. **Trade winds** continuously replace this saturated air. **Coriolis force** provides the required torque to the rising moisture and it moves towards land because of differential heating of land and sea. **Whirling movement** is enhanced when doldrums are farthest from equator (August/September in Northern hemisphere and March/April in Southern hemisphere).

![Diagram of Tropic of Cancer and Tropic of Capricorn](image)

**Structure/ Characteristics**

- **Isobars** are circular and close – means there is a steep pressure gradient
- **Diameter** of the whole cyclone varies from 150 to 300 km
- The center of the storm is called **Eye** having a restricted diameter of about 30 km. In the eye, atmospheric pressure is excessively low. **Subsidence of air** takes place here causing calm air and clear sky.
- **Inner Ring**: violent winds of speed 120 km/hr circulate around the eye. **Wind is upwelling** here, forming a sort of Eye Wall. It is 30-50 km wide with torrential rainfall, thunderstorm and lightening.

- The **outer ring** i.e. area outside inner ring is characterized by **reduced rainfall** and wind speeds.

- The winds are **anticlockwise in NH**, reverse in SH. Winds move towards the core, and veer to right.

![Diagram of Cyclone](image)

**Movement**

Follow fairly **well defined track**, moving at a speed of 15-25 km/hr covering a distance of 300-500 km a day. At about **20° latitude**, these move westward, then pole-ward between 20°-25° latitudes. Between 25°-30° latitude, these first move in north-easterly direction and then finally turn eastwards.

![Movement Diagram](image)

**Distribution on World Map**

In the different region of tropical areas, these are known by different names
- **Tropical Disturbance**: Caribbean and Gulf of Mexico. Weak, sluggish, many times stationary
- **Tropical Depression**: India & North Australia. Close isobars, small size, Gale force
- **Tropical Storm**: Bay of Bengal & Arabian Sea. Closed isobars, circular, strong cyclones
- **Hurricanes/ Typhoons/ Willy-Willy/ Taifu**: China, Japan, USA, and Korea. Closed isobars, circular, violent heavy rain, feeble eye.
- **INDIAN ASPECT**: Tropical depression (or if intensified, tropical cyclones) form in Bay of Bengal. Each monsoon month has 1-4 of tropical depressions. These travel along ITCZ whose position keeps on changing because of changing pressure conditions. Much of rainfall in North and North West India occurs because of these. Maximum rainfall takes place along its path & goes on decreasing North & North West.

**Associated Weather**

Tropical Cyclones show a pattern of weather change with their consequent movement. Each part of the cyclones is associated with a particular kind of weather phenomenon.

- When the **cyclone arrives**, **Eye Wall weather conditions** prevail with 100-250 mm rainfall in one storm along with lightening. It prevails for few hours with cumulonimbus (Cu-Ni) clouds.
- When **Eye arrives**, the weather is calm, sky is clear and rain stops. It takes around ½ hr for the eye to pass.
- When **Eye passes**, same weather conditions as that of arrival prevail with winds in opposite direction.
- Heavy rain continues even after winds become weak.
- The **energy of cyclones dissipates** as these moves landward because the source of energy (i.e. ocean) is cut off. The latent heat of condensation of cumulonimbus clouds provide them required energy. This is the reason that **maximum damage caused by cyclones is in coastal areas** as they fail to move too inside the land, and move back towards oceans in a curved trajectory.
Impact

- These are very severe and disastrous natural hazards inflicting heavy loss to human and animal life along with crops, property and communication network. Trees are uprooted, economy is shattered and the people are left forever in trauma. Cause havoc in coastal areas. Approximately 80 Tropical Cyclones occur every year. Rainfall of 25 cm/day is common.
- Orissa cyclone (1999) claimed 1 lakh precious lives while and similar cyclone in 1731 caused > 3 lakh deaths.
- Sea waves rise to a height of 20 m and cause damage by landward movement
- The storm surge is responsible for the greatest damage, 90% of the death are attributable to the sudden deluge owing to the instantaneous onrush of water and rise in water level with hurricane winds.
- River mouth appears to be the preferred areas of landfall of most cyclones, that too at the high tide epoch. The river mouths are usually flat alluvial plain devoid of trees, facilitating rapid and easy inflow of water.
- In June 2010, Cyclone Agatha struck the Mexico coast killing many hundred people.
- Cyclone Phet struck the Pakistan’s Arabian Coast and adjoining countries in 2010 affecting many thousand people.
THUNDER AND LIGHTENING

- Most thunderstorms occur from massively tall cumulonimbus clouds. The sun warms moist air near the earth’s surface, and makes it rise. As this air moves upwards, it cools and can condense to form cumulus clouds. The small, white fluffy cumulus clouds can group together and form one larger cumulonimbus cloud if there is enough rising warm air.
- If tall enough to reach the cooler air of the stratosphere, strong winds may widen the top of the cumulonimbus cloud. This may have the appearance of a top-heavy, flattened, anvil shape and is a good indicator that a thunderstorm is on its way.
- The way thunderstorms form mean they are more common in the afternoons of tropical regions where there is more moist, warm air and more heat to make it rise. Most parts of the world have thunderstorms, especially mountainous areas, which help form cumulonimbus clouds with increased uplift of air. Only hot, dry deserts and extremely cold Polar Regions rarely see thunderstorms.

Thunder

- Thunder is the rumbling or crack of sound that can usually be heard from the sky during a storm. Thunder is caused because lightning heats up the air, to about 30,000°C, causing it to expand quickly. The rumbling occurs as the sound passes through atmospheric layers at different temperatures.

Lightning

- Lightning is thought to be due to the formation of ice crystals in the top layers of the cumulonimbus cloud as it reaches a cooler part of the atmosphere called the stratosphere.
- As these crystals bump into each other a tiny bit of electrical energy, (charge) may be created within a larger, storm-wide, electrical field. It works a bit like static electricity on your hair from a jumper, or from a desk chair wheeled across a carpet.
- Light, positive charged ice and water gathers at the top of the cloud and the heavier negative particles gather at the base. The ground below is also positively charged. The difference in electrical charges can become so great that energy is released as lightning.
- A typical discharge is usually about 1.5 million volts and most of this is changed into heat energy. Although these high temperatures only last a millonth of a second it is enough to vapourise the fluid of a tree and cause it to explode.
- Although lightning appears to move from clouds to the ground, the flash we see is actually returning to the storm clouds. Lightning can be sheet lightning occurring within the cloud or fork lightning between clouds. Lightning sensors have been used to track lightning since the 1980s. Satellites have been used to collect long-term data on all lightning since the 1990s, and the global average has been calculated at 30 – 40 flashes per second.
- 90% of lightning never reaches the ground, but when it does it can strike twice.
- The Empire State Building in New York has been hit 48 times in one day. Single trees on high, exposed ground are likely to be hit by lightning. You are safe inside a car as lightning is carried to the ground through the metal body of the car instead of through the person inside.
TEMPERATE CYCLONES
(Extra-Tropical Cyclones/ Wave Cyclones/ Depressions/ Troughs/ Low Cyclones)

The low-pressure wind systems blowing inwards in the extra-tropical regions are known as temperate cyclones. These influence the weather conditions of the areas where these move and cause a significant impact on economics of these regions. These originate both over land and ocean, and move anticlockwise in northern hemisphere and clockwise in southern hemisphere. The causes of their origin could be-
1. Dynamic i.e. confluence of contrasting polar and tropical air masses and
2. Thermodynamic i.e. insolation of landmasses in summer

ORIGIN OF TEMPERATE CYCLONES

Thermodynamic Origin/ Insolation Cyclones

Brunt Theory/ Humphreys Theory provides an explanation to their origin. In summer, the sunrays heat up the huge landmasses in temperate zones viz. North America, and Russia. This creates low pressure over these areas and attracts winds from all direction, thus developing cyclones. These are stationary over the areas of their formation. These are formed over Iberian Peninsula, Alaska, SW USA and North-West Australia. Similar formation takes place over oceans during winters as low pressure develop over them surrounded by high-pressure cold airmasses over land. In winter, these are formed over Okhotsk Sea, Norwegian Sea, and North Atlantic.

Dynamic Origin

Polar Front Theory (PFT) of Bjerknes provides fundamental explanation to the origin of temperate cyclones. Convergence of two contrasting airmasses- One, cold and dry polar airmass and other, warm, moist and maritime tropical airmass takes place. This leads to formation of fronts. The cold airmass pushes the warm air upwards. The up-moving warm air creates a low-pressure shaft, which attracts air from surroundings. The earth's rotation causes the winds to rotate and cyclonic formation takes place as shown in diagram.

Polar Front Theory is an explanation of Frontogenesis and Frontolysis. Frontogenesis is coming together of air masses and formation of depression. Frontolysis is horizontal divergence of air from frontal zone, together with subsidence and gradual dissipation of frontal zone.

1. Two air masses with contrasting physical properties move parallel to each other and a stationary front is created
2. Warm and cold air masses penetrate into the territories of each other and a wave like front is formed. This is called incipient stage.
3. Cyclone becomes fully developed and isobars become almost circular. This is called mature stage.
4. Low pressure accompanied by convergence and rising air at the center and along the front. Cold front overtakes warm front.
5. Cold front finally overtakes the warm front and an occluded front is formed.
6. Warm sector completely disappears, occluded front is eliminated and ultimately cyclone dies out.
"Life Cycle of cyclone"

CHARACTERISTICS OF TEMPERATE CYCLONES

- **Size and Shape**: Isobars are oval or elongated in shape. In exceptional cases, these are circular. Their diameter varies from 150-3000 km.
- **Structure**: Lowest pressure occurs near the center. Winds rotate in anticlockwise direction in NH and clockwise in SH around the center.
- As it is formed by convergence of two contrasting airmasses, therefore, there is variation in nature and direction of winds in different parts. Tropical part is of westerly direction, polar part of easterly direction.
- **Movement and Direction**: These may be practically stationary or moving at 1000 km/day. **General direction of movement is west to east** in mid-latitudes under the influence of Westerlies. **Speed greater in winter** than in summer.
- **Warm front and warm sector** characterized by warm southerly and southwesterly winds which changes to west, north westerly and north at arrival of cold front and cold sector.
ASSOCIATED WEATHER

As the cyclone advances, the passage of each front is associated with a distinctive sequence of cloud, rain and temperature change. Because of convergence of two contrasting airmasses, different temperatures in different parts prevail. There is dominance of warm air in southern parts, while low temperatures occur in north, northeast and north-west. Western parts have the lowest temperatures.

- **Before the arrival of cyclone**, the high wispy cirrus clouds appear first on the western horizon.
- **As the front approaches, clouds lower and thicken** and the sky becomes overcast with cirrostratus, altostratus and nimbostratus clouds. The warm front precipitation continues for 2-3 days, moderate but spread over large areas. The wind direction changes from southeast to south. The wind coming from south is relatively warmer.

![Diagram of air direction and conditions below freezing](image)

Warm air rises at this place, thereby creating a vacuum, which is readily filled by cold air, and so maximum wind speed. Further, since there are no cumulous clouds formed, precipitation is not very heavy. Further, cold air has lesser moisture holding capacity. Dew point is reached fast and thus condensation in cold air takes place in the form of fogs. Raindrops freeze as these travel through cold air and fall in the form of ice pellets.

- When the cold front approaches, marked drop in temperature takes place. Clouds become cumulus. Rainfall becomes heavy and limited to smaller area. This is sometimes accompanied by violent thunderstorms and hails. The winds blow from north and north-westerly direction, a shift from southerly to south-westerly direction.
- Gradually the final uplift of warm sector takes place and the occluded front is formed. After the occlusion, the depression tends to ‘fill up’ and the cyclone dies away.

![Diagram of air direction and occlusion](image)
**DISTRIBUTION**

Generally found between 30-50° N&S. Position shifts towards equator during winter and towards poles during summer. Some of favorable regions include:-
1. East of Sierra Nevada
2. East of Colorado
3. East of Canadian Rockies in Alberta
4. Great lakes region
5. West of Appalachians
6. Iceland and Barren Sea
7. Around Baltic Sea in Europe etc.

**Tornadoes:** Intense storms formed in Mississippi valley. It is formed over the land. These are narrow and funnel shaped.
**Overview**

Earth is the only planet, among the nine around the sun which supports life. Despite the vastness of earth, life exists only in a very thin layer enveloping the earth called biosphere. Sun is the only source of energy which enables continuous interaction among various life forms. The variety of life on Earth, its biological diversity is commonly referred to as biodiversity. The number of species of plants, animals, and microorganisms, the enormous diversity of genes in these species, the different ecosystems on the planet, such as deserts, rainforests and coral reefs are all part of a biologically diverse Earth.
MAJOR SANCTUARIES/NATIONAL PARKS

Nagarjunasagar - Srisailam Sanctuary

- Nagarjunasagar spreads over five districts - Nalgonda, Mahabubnagar, Kurnool, Prakasam and Guntur - in the state of Andhra Pradesh.
- This sanctuary was established in the year 1982 under section 18 of the Wildlife Protection Act, (1972) for the conservation of flora and fauna of Central Deccan Plateau and Peninsular India. Subsequently it became one of the largest links in the Tiger Reserves designated under the Project Tiger.
- The area is an abode of endangered species like Tiger, Panther, Fishing cat, Indian Wolf, Rattle, Pangolin, Smooth Indian Otter, Black buck, Mouse deer, Chinkara and four horned antelope. The existing value of this Tiger Reserve is greatly enhanced by its geomorphological features.
- Extensive plateau areas, deep precipitous gorges with peculiar rock formations and serpentine ghat, cool valleys, cut with perennial streams, springs, moist forest patches and dry deciduous thorny shrub-lands presents diverse ecosystems for harbouring varied fauna of the area.

Namdapha National Park

- Namdapha, a Tiger Reserve and National Park, a true wilderness and enchanting beauty of lush green vegetation, impenetrable pristine and virgin forests covered an area of 1985.23 square kilometers having diverse flora and fauna lies in the international border between India and Myanmar (Burma) within Changlang District in the state of Arunachal Pradesh in the northeast India.
- Namdapha National Park is located at a few kilometers away from Miao amidst misty blue hills along the turbulent Noa-Dihing river lies in the sprawling tropical rain forest. It was declared as Tiger Reserve by the Government in 1983.
- Among the bird species, most notable are the White winged Wood Ducks, a rare and endangered species, the great Indian hornbills, jungle fowls and pheasants flop their noisy way through the jungle, and which harvests other colourful bird and animal species. The grandeur of the wet tropical rain forest is breeding ground for varieties of animals and birds which is remarkable and worth seeing.
- It is only park in the World to have the four Feline species of big cat namely the Tiger (Panthera Tigris), Leopard (Panthera Pardus), Snow Leopard (Panthera Uncia) and Clouded Leopard (Neofelis Nebulosa) and numbers of lesser cats.
- A number of primate species are seen in the park, such as Assamese macaque, pig-tailed macaque, stump-tailed macaque and number of the distinctive Hoolock Gibbons (Hylabates Hoolock), highly endangered and only 'ape' species found in India dwells in this impenetrable virgin forest.

Kaziranga National Park

- The Kaziranga National Park is the only National Park in the State situated in central Assam with an area of 430sq. km. It is the home of the great Indian one horned Rhinoceros (Unicornis).

crackIAS.com
• The landscape of Kaziranga is of sheer forest, tall elephant grass, rugged reeds, mellow marshes and shallow pools. One-horned rhinoceros, elephant, Indian bison, swamp deer, sambar, hot deer, sloth bear, tiger, leopard, pig, leopard cat, jungle cat, hog badger, capped langur, hoolock gibbon, jackal, porcupine, python, buffalo and birds like pelican, duck, geese, hornbill, ibis, cormorant, egret, heron, black necked stork, lesser adjutants, ring-tailed fishing eagles, etc are found in large numbers.
• Lush coffee, enchanting tea gardens and rubber plantations are situated nearby Karbi Anglong here.

Manas Tiger Reserve

• Manas Tiger Reserve in Assam was created in 1973 at the time of launch of the Project Tiger in India. The Reserve area falls in six districts, Kokrajhar, Bongaigaon, Barpeta, Nalbari, Kamrup and Darrang.
• Rich in biodiversity of both flora and fauna, Manas has 22 species of fauna that are globally endangered. In 1985 it was declared a world heritage site.
• The moist sal forests, East Himalaya lower Bhabar sal and Eastern Terai sal forests, riverine successions, moist mixed deciduous forests and so many more include species like Tiger, leopard, clouded leopard, Golden cat, leopard cat, pangolin, Indian Elephant and Rhinoceros, Asian water buffalo, Gaur, Swamp deer and the Pygmy Hog.
• There are at least two species of wild animals, endemic to this zone, Pygmy hogs and the Golden langur. The pygmy hogs are found, now only in this Tiger reserve, into known former range of distribution, while the Golden langur (Presbytis geei) have never been recorded beyond the limits of this Tiger reserve.
• There are 21 recorded endangered species of mammals. These are Capped Langur, golden Langur, Slow Loris, Tiger, Black Panther, Leopard Cat, Clouded Leopard, Golden Cat, Fishing Cat, Bear cat, Sloth Bear, Asian Elephant, Indian Pangolin, one-horned rhinoceros, Asiatic Water Buffalo, Swamp Deer, Particoloured Flying Squirrel, Hispid Hare and Gangetic Dolphin.

Valmiki National Park

• Valmikinagar is located nearly 100 kms from Bettiah in the northernmost part of the West Champaran district, (Bihar) bordering Nepal. It is a small town with scattered inhabitation, mostly within the forest area and a railroad station in the district of West Champaran close to the railhead of Narkatiyaganj.
• The park is bounded by the Royal Chitwan National Park of Nepal in the north and the river Gandak on the western side with the Himalayan Mountains as backdrop.
• One can see Tiger, Sloth Bear, Wolf, Deer, Serow, Leopard, Python, Peafowl, Chitals, Sambars, Nilgais, Leopards, Hyenas, Indian Civets, Jungle cats, Hog deer, Wild dogs One horned rhinoceros and Indian bison often migrate from Chitwan to Valmikinagar.

Bhimbandh Sanctuary

• Bhimbandh Wild Life Sanctuary is located in the south west of Munger District (Bihar). The forest covers an area or 681.99 sq.km. It is situated at a distance of 56 km from Munger, 20 km from Jamui Railway Station and 200 km from Patna Airport.
• This forest is located in the famous Kharagpur hill range, south of river Ganga and is surrounded on all sides by non-forestry areas inhabited by dense population. The vegetation of these forests is very rich where Sal, Kend, Semal and other trees grow side by side the
hilly terrain, protecting from the suns rays the forms and humble creepers which grow below.

- A host of animals such as Tiger, Leopards, Sloth Bear, Nilgai, Sambhar, Barking deer, Wild Beer, four horned Antelope use to abide by in these forests. In the valley portions and at the foothills are several hot springs of which the finest are at Bhimbandh, Sita Kund and Rishi Kund. All the hot springs maintain nearly same temperature round the year, and seasonal fluctuation of discharge is also nominal.

**Rajgir Sanctuary**

- The Rajgir Sanctuary is located at Patna (Bihar). The Sanctuary is stretched in an area of 35.84 sq. km.
- The Sanctuary area is full of small hills an undulating land. There are number of hot water springs in the area. Sulphur content in hot water is quite high.
- Among the wildlife found in the Sanctuary the notable ones are Leopard, Hyena, Barking Deer, and Nilgai etc. The birds, which have been identified, are peafowl, jungle fowl, partridge, black and grey quails, hornbill, parrot, dove, myna etc. Wild bear is very common to this area.
- In addition to the Sanctuary there is a Bamboo Park (Venuvana). This was originally a park of King Bimbisara.
- The Forest Department constructed beautiful Deer Park with Cheetals, Nilgais and Sambhars. To add to all other beautiful places of historical importance there is an Arial Ropeway that provides the link with a hilltop Buddhist Stupa built by the Japanese.

**Kaimur Sanctuary**

- The Kaimur Wild Life Sanctuary is located in the District of Kaimur (Bihar). Area of the sanctuary is 1342 sq.km, which is mainly confined to hills and undulating ground.
- Black bucks, Nilgai, Chinkara, Tiger, Leopard, Hyena, Wild boar, sloth bear etc are the common species found in these forests.
- Other important tourist places in the adjacent area are Mausoleum of Sher Shah at Sasaram Dhuan Kund (a natural water fall), Karkat Gadh etc.

**Gautam Buddha Sanctuary**

- The Sanctuary is located at a distance of 20 km from Gaya and 60 km from Bodh Gaya (Bihar). The area of the Sanctuary is 259 sq.km situated on either side off the NH2.
- The forest of the sanctuary is located on the hill and undulating tracts lying north of the hilly terrain which is an extension of Chhotanagpur plateau.
- Among the wild Life found here are Tigers, Leopards, Hyenas, Sloth Bear, Wolf, Wild Dog, Wild Boar, Sambhar, Spotted Deer and Nilgai etc.

**Udayapur Sanctuary**

- Udaipur Wild Life Sanctuary is located in the district of West Champaran (Bihar) about 15 km from Bettiah. It covers an area of 8.87 sq.km. Spotted Deer, Barking Deer, Wild Boar, Nilgai, Wolf, Jungle Cat etc are found in the forest.
Kabar Jheel Bird Sanctuary

- The Kabar Jheel (Lake) Bird Sanctuary is located 22 km north west of Begusarai (Bihar). Area of the sanctuary is 63.11 sq.km.
- This Lake is formed through the meander of River Burhi Gandak that supports about 59 types of migratory birds and 106 residential species as well as 31 species of fishes.

Gogabil Bird Sanctuary

- This Sanctuary is situated at a distance of 26 km from Katihar (Bihar) and is spread over an area of about 217.99 km. By virtue of its global, national and regional significance the State Government has declared Gogabil Bird Sanctuary as a closed area.
- This wetland is rich in aquatic flora and fauna and is a fascinating wintering ground for the migratory birds.

Barnawapara Wildlife Sanctuary

- Barnawapara Wildlife Sanctuary (Chhattisgarh) is one of the finest and important wildlife sanctuaries in the region. Established in 1976 under Wildlife Protection Act of 1972, the sanctuary is relatively a small one covering an area of only 245 sq km.
- The topography of the region comprises of flat and hilly terrain with altitudes ranging between 265-400 meters. The Barnawapara Wildlife Sanctuary is known for its lush green vegetations and unique wildlife.
- The flora of Barnawapara Wildlife Sanctuary chiefly comprises of tropical dry deciduous forest with Teak, Sal, Bamboo and Terminalia being the prominent trees. Other major plants found in the sanctuary include Semal, Mahua, Ber and Tendu.
- The major wildlife of the Barnawapara Sanctuary include Tigers, Sloth Bear, Flying Squirrels, Jackals, Four-horned Antelopes, Leopards, Chinkara, Black Buck, Jungle Cat, Barking Deer, Porcupine, Monkey, Bison, Striped Hyena, Wild Dogs, Chital, Sambar, Nilgai, Gaur, Muntjac, Wild Boar, Cobra, Python to name a few.
- The sanctuary also has a sizable bird population with prominent being the Parrots, Bulbul, White-rumped Vultures, Green Avadavat, Lesser Kestrels, Peafowl, Wood Peckers, Racket-tailed Drongos, Egrets, and Herons to name few.

Indravati National Park

- Indravati National Park is the finest and most famous wildlife parks of Chhattisgarh. Also the only Tiger Reserve in the state, Indravati National Park is located in Dantewada district of Chhattisgarh.
- The Park derives its name from the Indravati River, which flows from east to west and forms the northern boundary of the reserve with the Indian state of Maharashtra.
- With a total area of approximately 2799.08 sq km, Indravati attained the status of a National Park in 1981 and a Tiger Reserve in 1983 under the famous Project Tiger of India to become one of the most famous tiger reserves of India.
- The flora in the Indravati National Park is mainly consists of tropical moist and dry deciduous type with high proportion of Sal, S and Bamboo trees. There are also well-off patches of excellent grasslands providing much required fodder to Wild buffalos, Chital, Barking Deer, Nilgai, Gaus and other herbivores of the park.
- The most commonly found trees in the park are Teak, Lendia, Salai, Mahua, Tendu, Semal, Haldu, Ber and Jamun. The major wildlife in Indravati National Park include the rare Wild Buffalos, Barasinghas, Tigers, Leopards, Gaus (Indian Bison), Nilgai, Sambar, Chausingha.
(four-horned Antelope), Sloth Bear, Dhole (Wild Dog), Striped Hyena, Muntjac, Wild Boar, Flying Squirrel, Porcupine, Pangolins, Monkeys and Langurs among many others.

- The commonly found reptiles in the park are Freshwater Crocodile, Monitor Lizard, Indian Chameleon, Common Krait, Indian Rock Python, Cobra and Russell's Viper to name a few. The Park also gives shelter to the large variety of birds of which Hill Maina is the most important species here.

**Sitanadi Sanctuary**

- Located in Dhamtari district of Chhattisgarh, Sitanadi Wildlife Sanctuary is one of the most famous and important wildlife sanctuaries in central India. Established in 1974 under Wildlife Protection Act of 1972, the sanctuary covers an area of approximately 556 sq km, comprising of highly undulating and hilly terrain with altitudes ranging between 327-736 meters.
- The beautiful sanctuary derives its name from the Sitanadi River that originates in the middle of sanctuary and joins Mahanadi River near Deokhut.
- Sitanadi Wildlife Sanctuary is known for its lush green flora and rich and unique and diverse fauna and has great potential to emerge as one of the finest wildlife destinations in central India.
- The flora in Sitanadi Wildlife Sanctuary chiefly comprises of moist peninsular Sal, Teak and Bamboo forests. Other major plants in the sanctuary include Semal, Mahua, Harra, Ber and Tendu. The rich and lush vegetation cover supports a wide variety of wildlife in the sanctuary.
- The major wildlife found in Sitanadi Sanctuary include Tigers, Leopards, Flying Squirrels, Jackals, Four-horned Antelopes, Chinkara, Black Buck, Jungle Cat, Barking Deer, Porcupine, Monkey, Bison, Striped Hyena, Sloth Bear, Wild Dogs, Chital, Sambar, Nilgai, Gaur, Muntjac, Wild Boar, Cobra, Python among many others.
- The sanctuary also has a sizable bird population with prominent being the Parrots, Bulbul, Peafowl, Pheasant, Crimson Breasted Barbet, Teetar, Tree Pie, Racket-tailed Drongos, Egrets, and Herons to name few.

**Udanti Sanctuary**

- Located in Raipur district of Chhattisgarh, Udanti Wildlife Sanctuary is a small but an important wildlife sanctuary in the region.
- Established in 1983 under Wildlife Protection Act of 1972, the sanctuary covers an area of approximately 232 sq km. the topography of the sanctuary comprises of broken mass of land traversed by innumerable hill ranges intercepted by stripes of plains.
- The beautiful sanctuary derives its name from the Udanti River flowing from the west to east covering major part of the sanctuary.
- Udanti Wildlife Sanctuary is famous for its population of the endangered Wild Buffalos. For their survival and growth many steps have been taken by the forest department officials. A large number of man-made tanks have been constructed all across the width and length of the sanctuary.
- The flora in Udanti Wildlife Sanctuary chiefly comprises of Tropical Dry Peninsular Sal forests and Southern Tropical Dry Deciduous Mixed Forests. Major flora in the sanctuary comprises of Teak, Sal, Salai, Bamboo, Mahul, Semal, Mahua, Aonwla, Tendu, Harra and Ber among others.
- The wildlife found in Udanti Sanctuary include Wild Buffalos, Panthers, Tigers, Chital, Four-horned Antelopes, Chinkara, Black Buck, Sambar, Nilgai, Jungle cat, Barking Deer, Sloth
bear, Gaur, Wild dog, Porcupine, Monkey, Jackals, Bison, Striped Hyena, Fox, Cobras, Pythons etc.

- The sanctuary also has a sizable population of birds with prominent being the Parrots, Bulbul, Peafowl, Racket-tailed Drongos, Egrets, Heron, Magpie robin, Lesser whistling Teal, Pintail, Rollers and Herons to name few.

**Kanger Ghati National Park**

- Located amidst the 34 km long and scenic Kanger Valley (Chattisgarh), a Biosphere Reserve, Kanger Valley National Park is one of the most beautiful and picturesque national parks of India. Known for its scenic beauty and the unique and rich biodiversity, Kanger Valley attained the status of a National Park in 1982.
- Besides wildlife and plants, there are many tourist attractions inside the park such as the Kutamsar Caves, Kailash Caves, Dandak Caves and Tiraghar Waterfalls. Kanger Dhara and Bhaimsa Dhara (a Crocodile Park) are the two beautiful and exotic picnic resorts in the Park.
- The Park also has a sizable tribal population and can be an ideal destination for wildlife enthusiasts, nature lovers, researchers, anthropologists and for anyone who wants to discover the very best of Chhattisgarh wildlife and unique tribes of the region.
- The flora in the park chiefly comprises of mixed moist deciduous type of forests with predominance of Sal, Teak and Bamboo trees. In fact, the Kanger Valley is the only region in the Peninsular India where one of the last pockets of virgin and untouched forests still left.
- Major Wildlife of the Kanger Valley National Park are the Tigers, Leopards, Mouse Deer, Wild Cat, Chital, Sambar, Barking Deer, Jackals, Langurs, Rhesus Macaque, Sloth Bear, Flying Squirrel, Wild Boar, Striped Hyena, Rabbits, Pythons, Cobra, Crocodiles, Monitor Lizards and Snakes to name a few.
- The avian fauna at the Park includes Hill Myna, Spotted Owlet, Red Jungle Fowls, Racket-tailed Drongos, Peacocks, Parrots, Steppe Eagles, Red Spur Fall, Phakta, Bhura Teeter, Tree Pie and Heron among many others.

**Achanakmar Wildlife Sanctuary**

- Achanakmar Wildlife Sanctuary (Chattisgarh), was constituted in the year 1975 it comprises of 557.55 Sq.km. Achanakmar Wildlife Sanctuary in India is the proud owner of a rich fauna.
- Achanakmar Wildlife Sanctuary has numerous species of wild animals like the Chital, Wild Bear, Leopard, Tiger Panthera, striped Hyaena, Canis aureus jackal, sloth bear Melursus ursinus, Indian wild dog Cuon alpinus, Chital Axis axis, four-horned antelope or Tetracerus quadricornis, nilgai Boselaphus tragocamalus, Chinkara, Blackbuck, Wild Boar and many more.

**Bhoramdeo Sanctuary**

- Bhoramdeo wild life sanctuary is one of the eleven wild life sanctuaries of Chhattisgarh state. It is located at kabirdham district. It is named after famous Bhoramdeo temples.
- Bhoramdev Wildlife Sanctuary in Chhattisgarh is composed of Sal, Saja, Teinsa, Kara and Haldu species. The fauna comprises mostly of wild animals like leopard, hyena, fox, bear, cheetal, wild buffalo, nilgai etc.
- The river Sakari flows through the sanctuary is the source of drinking water for wild animals.
Guru Ghasidas National Park

- Guru Ghasidas National Park is actually a part of the former Sanjay National Park. This separate park was formed when Chhattisgarh was bifurcated from Madhya Pradesh and formed a state in itself.
- 60% of the park is located in the Koriya district of Chhattisgarh. It is named after the reformist hero of the place Guru Ghasidas.
- The vegetation of Guru Ghasidas National Park consists mainly of mixed deciduous forest with teak, sal and bamboo trees. The diverse vegetation of the region consists of a wide variety of mammal population.
- Tigers, Leopards, Chital, Nilgai, Chinkara, Jackals, Sambar, Four-horned Antelopes, Jungle Cat, Barking Deer, Porcupine, Monkey, Bison, Striped Hyena, Sloth Bear, and Wild Dogs are some of the common species found in this region. It is also an ideal place to watch migratory birds.

Badalkhol Wildlife Sanctuary

- Chhattisgarh is one of the new members among the states of India. Out of the total area of the place 44% is covered with forests. 12% of the total forest area of the country is in Chhattisgarh. It is rich in various wildlife species.
- The important species in the sanctuary are deer, chinkara, gazelle and the spotted deer.
- There are other species as well like Nilgai, Sambar, Chausingha, sloth bear, wild boar, jackal and hyena. Among the birds there are peacock, fowl, pigeon, quail, parrot and stork.
- At times the migratory birds also visit this place. Tigers and leopards are also there at the Badalkhol Wildlife Sanctuary Madhya Pradesh. They are however in limited numbers.
- A lot of rare birds can be seen in these sanctuaries and is considered to be a bird watchers paradise. At times you also get the opportunity to meet a bison.

Pameda Wildlife Sanctuary

- Pameda Wildlife Sanctuary in Chhattisgarh in India is located in Dantewada District of Chhattisgarh. The total area is 260 sq km and there is mixed deciduous forest.
- Pameda Wildlife Sanctuary has some precious trees like sal and teak. There are mixed forests creating a different aura about the place.
- Deers can be easily sighted. Here you find the chital or the spotted deer, Indian Gazelle and the chinkara. Those who are interested in wildlife will never forget the images of the deer running all around the sanctuary like carefree creatures of nature.
- One can find sloth bear, wild boar, wild dog, jackal, wolf, hyena, bison, nilgai, and sambar.
- All those who are interested in birds the sanctuary provides with a chance to see a lot of them. There are beautiful peacocks, pigeons, quail, parrot, jungle fowl, and stork. Migratory birds are also visible in different parts of the sanctuary.

Salim Ali Bird Sanctuary

- One of the smallest bird sanctuaries in India it is named after the noted ornithologist of India, Salim Ali. It is covered with mangrove swamps which offer an ideal habitat for migratory as well as local birds.
- There are a number of rare species of birds in this sanctuary. At the confluence of Mapusa and Mandovi Rivers in Goa lies the Salim Ali Bird Sanctuary.
Bhagwan Mahavir Wildlife Sanctuary

- Lying on the eastern side of Goa, Bhagwan Mahavir Wildlife Sanctuary is the largest wildlife sanctuary in the state. Covering massive area of 240 square kilometers, the sanctuary is an ideal habitat for exotic species of wild animals such as Deers and Guars, Malayan Giant Squirrels, Cobras and Pythons.
- Habitat includes Sloth Beer, Flying Lizard, Leopard Cat, Elephants and Tigers.

Cotigao Wildlife Sanctuary

- Spread within an area of 86.65 sq km and sixty kilometres from Panjim is Cotigao wildlife sanctuary (Goa). The sanctuary has thick deciduous forest and trees as long as thirty metres high.
- The forest is not exactly as raw as other sanctuaries since there are dwellings around.
- Sanctuary has Wild Boars, Langur, Deer, Bison, Pangolin and Black Panther.
- The sanctuary has a lake also, Bela lake and a Nature Interpretation Centre which has botanical and faunal exhibits.

Bondla Wildlife Sanctuary

- The lush green and strikingly beautiful foothills shelter the Bondla Wildlife Sanctuary, which is the smallest wildlife reserve in Goa.
- The Bondla Wildlife Sanctuary is spread over an area of about 8 square kilometers.
- The sanctuary is home to the sambar deer, Gaur (Indian Bison), the black-faced Langur, jackals and wild boar amongst other animals.
- Many times, elephants have also been spotted. The Bondla Wildlife Sanctuary provides refuge to numerous species of deer as well.

Velavadar / Black Buck National Park

- This small part of Bhal region (34.52 sq.km.), Gujarat which was declared as Blackbuck National Park in July 1976, is open grassland. The sanctuary has been declared primarily for Blackbucks.
- The beauty of the grassland is enhanced by the movements of blackbucks and nilgais.
- The majestic blackbucks are less shy of human being here and one has a sure chance of watching them in their natural mood, leaping high in air, running, feeding drinking, rutting and chasing.
- The grassland lies between two rivers namely Parvalia and Alang, which drain into the Gulf of Cambay. During the monsoon the area is often flooded.
- The blackbuck herds are mostly to be found in the northern part of the sanctuary, while the southern part has patches of thorn forest providing excellent opportunities for bird watching (especially birds of prey).
- The Alang River forms the southern border of the Park and is the favourite retreat for wolves.

Nalsarovar Bird Sanctuary

- Nalsarovar Bird Sanctuary located some 70 kilo meter away from Ahmedabad in Gujarat covers an area of 116 square kilo meter.
- Nalsarovar Bird Sanctuary is a spectacular natural lake with shallow waters and muddy lagoons, dotted by 360 islets.
• It offers an ideal wintering ground for thousands of migratory birds. These birds travel tiring lengths from Central Asia, Europe and Siberia to escape from severe cold of harsh winter there.
• In addition to migratory birds, many resident as well as local migratory birds also visit this place. This lake and the wetlands around it were declared a bird sanctuary in April 1969.
• Migratory birds start arriving here in October and stay till April. Their population reaches its peak in mid winter. There are 360 islets in the lake. Most of them lie exposed when the water level is low.
• The lake gets filled with water that drains from the adjoining Surendranagar and Ahmedabad districts in the monsoon. With this fresh water inflow, brackishness in the lake is reduced considerably.
• The sheer number of birds that is encountered in this beautiful place leaves the bird-watchers spellbound.
• Both the flamingos i.e. lesser and Greater inhabit Nalsarovar. The former frequents the sanctuary during monsoon and post monsoon periods whereas the latter becomes abundant as the salinity increases after the monsoon.

Sasan Gir National Park

• Located in the south west of the Saurashtra peninsula, the Gir National Park Gujarat is a haven to about 300 Asiatic lions.
• The 1,412.13 sq. km. Park has a rugged landscape and the sheer rocky hillsides are covered in mixed deciduous forests.
• The Gir National Park is the only known home of the famous Asiatic Lion. The park is one of the best wildlife sanctuaries in India.
• The Gir National Park is the only place where you can see the lion in its natural habitat.
• It was established as a Forest Reserve in 1965, with the primary motive of conserving the Asiatic lion, it sprawls over 2,450 hectares of land.
• Gir also has nearly 210 leopards and numerous chital, nilgai, chinkara, the four homed antelope and wild boar. Marsh crocodiles are often seen along its rivers.

Rann of Kutch (Wild Ass)

• The Wild Ass Sanctuary is located in the Little Rann of Kutch of the Gujarat State in India. It covers an area of 4954 km.
• The Sanctuary is named after a sub species of wild ass (Equus hemionus khur), the last population of which it harbours. The wild asses in the Little Rann of Kutch are active during the night, to maximize resource intake in the natural vegetation-agriculture interface.
• The vast cover of saline mudflats in the Sanctuary has no vegetation, except on the fringes and bets. Vegetation is largely xerophytic with the ground cover predominated by ephemerals. Their active growth is triggered by the advent of monsoon rains.
• The Sanctuary is territory to about 93 species of invertebrates, including 25 species of zooplanktons, 1 species of annelid, 4 crustaceans, 24 insects, 12 molluscs and 27 spiders.
• Totally 4 species of amphibians (frogs and toads) and 29 species of reptiles (2 species of turtles, 14 species of lizards, 12 snakes and 1 crocodile) occur.
• The sanctuary provides an important feeding, breeding and roosting habitat for a large number of birds due to its strategic location on bird migration route and its connection with the dynamic Gulf of Kutch.
Ratan Mahal Sloth Bear

- Ratan Mahal Sloth Bear is spread in 56 sq km. It is situated on the Gujarat-Madhya Pradesh border and only exclusive sloth bear sanctuary in Gujarat. Apart from the sloth bear, it is also home to leopards, the blue bull (nilgai), wild boars and the Indian gazelle.

Sultanpur Bird Sanctuary

- Sultanpur Bird Sanctuary Haryana is a haven to a variety of domestic and migratory birds.
- Artificial mound, have turned into a green glade. The marsh has been converted into a water body. And with the years, hundreds of species of migratory birds have winged in to stay. Winter brings in birds from as far as Siberia. Flock of geese from Europe wing in too.
- The bird population includes darters, egrets, shovellers, gadwell and geese dominate. Teals, kingfishers, lapwings, sandpipers, demoiselle cranes and many more water birds nestle in.
- Local species include plovers, red-wattled lapwings, herons, cormorants, white ibises, spoonbills and painted storks.
- Other wildlife in the park include blackbuck, nilgai, hog deer, sambar, wild dog or dhole, caracal, wild cat, hedgehog, mongoose, striped hyena, Indian porcupine, rattle/honey badger, leopard, wild pig, and four horned antelope.

Great Himalayan National Park

- The National Park with an area of Himalayan Brown Beer 620 sq. km. is located in Kullu District and has the representative area of temperate and alpine forests of Himachal. It has some the virgin coniferous forests of the State. Vast areas of alpine pastures and glaciers cap this park.
- This area has many important wildlife species of Western Himalayas, like Musk deer, Brown bear, Goral, Thar, Leopard, Snow leopard, Bharal, Serow, Monal, Kalij, Koklas, Cheer, Tragopan, Snow cock etc.
- Trekking of Rakti-Sar, origin of Sainj River and camping in alpine pastures is unforgettable. Similar is the trekking route to Tirath the origin of Tirthan River.

Dachigam National Park

- Spread over an area of 141 sq. kms this picturesque Dachigam valley (JK) is bliss on earth, full of natural beauty with its surrounding mountainside, contains the rare Kashmir stag (Hangul).
- The park is famous as the only home for the highly endangered Hangul or Kashmir Stag. Rich and much unpolluted, Dachigam National park lies very close to Srinagar town, nestled in the dazzling slopes of the Kashmir Himalayas.
- The other wildlife at Dachigam National park consist of the Himalayan Black Bear, few species of the Goat including Markhor and Ibex, Leopard and the rare snow Leopard, Musk deer and the Himalayan Marmot.
- There are over 150 species of birds like - koklas, bearded vulture, griffon vulture, monal, golden eagle, grey heron, golden oriole, paradise flycatcher, starling, western yellow-billed blue magpie, kestrel, peregrine falcon, black bulbul, etc.
- The Dachigam Wildlife Sanctuary has over fifty species of trees, twenty of shrubs and five hundred species of herbs.
Kishtwar National Park

- Kishtwar National Park, Jammu and Kashmir is located in the district of Doda at the high altitude of 1,700 meters to 4,800 meters. Wide range of floras and faunas are available at the Kishtwar National Park.
- Some of the wild animals, which are available in this national park, are brown bear, leopard, snow leopard, Himalayan musk deer, hangul, ibex, serow, brown bear and others.
- There are some 14 species of mammals present in this national park. There are 28 species of avifauna that enliven the whole forested area. Some of them include pheasants, Himalayan monal, koklass, Himalayan snowcock and western tragopan.

Hazaribagh National Park

- Nestling in low hilly terrain, at an average altitude of 615 meters in the Indian state of Jharkhand, the Hazaribagh National Park has an abundance of wild animals like the wild boar, sambar, nilgai, chital, sloth bear, tiger and panther.
- Sighting of wild boar, sambar, nilgai, cheetal, and kakar is assured especially near the waterholes at dusk.
- The sanctuary stretches over 184 square km of undulating country and steep hills with dense tropical forests and grass meadows. The sanctuary is surrounded by tribal habitation.

Bandipur National Park

- Bandipur Tiger Reserve situated in Mysore District of Karnataka was among the first nine Tiger Reserves created in India at the launch of Project Tiger in 1973.
- It is contiguous to Madhumalai Wildlife Sanctuary in Tamil Nadu state to south and Wynad Wildlife Sanctuary in Kerala state to the south-west.
- To the north-west lies Nagarhole National Park. The highest peak is Gopalaswamy hill.
- A Sanctuary of 90 sq. km. area was created in Bandipur Reserve Forest in 1931. Venugopala Wildlife Park was constituted in 1941, extending over 800 sq. km.
- The Park was named after the deity, Venugopala of the shrine atop this hill. Bandipur Tiger reserve was formed by including most of the forest area of the then Venugopala Wildlife Park and its sanctum sanctorum at Bandipur, in the year 1973 and named Bandipur National Park.
- All the forests included in the Reserve are reserved forests notified prior to independence.
- The area is an abode of endangered species like Tiger, Leopard, Elephant, Gaur, Sambar, Spotted deer, Sloth bear, Mouse deer, Wild dog, four horned Antelope.

Nagarhole National Park

- Covering an area of 644 sq km, the Nagarhole National Park Karnataka is situated between the Kabini River and the Bandipur National Park.
- The Nagarhole National Park derives its name from two words 'Naga' meaning snake and 'hole' meaning streams.
- The Nagarhole National Park mainly consists of moist deciduous forest in the northern and western parts and dry deciduous forest in the south-eastern part.
- Nagarhole is among a few wildlife sanctuaries in India, which are considered to be safe haven for elephants. Nagarhole National Park is primarily an elephant territory.
- The Nagarhole National Park is also home to tiger, sloth bear and hyena, leopard, wild dog, spotted deer, sambar, barking deer, four-horned antelope, wild boar and gaur.
- Among 250 bird species found in park, the most common are the common bulbul, babbler, bee-eater, crested serpent, dove, hornbill, alexandrine, peacock, woodpecker, Malabar pied, warbler, great Indian reed, crested hawk, eagle, golden-back parakeet, and the southern tree pie.

**Periyar National Park**

- The Periyar Tiger Reserve, named after the Periyar River, is one of our prestigious possessions on the High Ranges of Western Ghats.
- The Periyar Tiger Reserve Kerala spreads over 777 sq km of tropical evergreen, semi-evergreen and moist deciduous forests. It was declared a Project Tiger Reserve in 1978 under the famous scheme, Project Tiger.
- Numerous small islets in the large 50 year old artificial lake remind us of the intricate, inherent interrelationship among the terrestrial aquatic and subterranean life forms.
- The evergreen forests have lofty tree and the canopy is closed. The varied habitat naturally supports a variety of species of mammals, birds, reptiles, amphibians and fishes.
- Tiger, panther and wild dog, elephant, gaur, sambar, barking deer, wild boar, sloth bear, Nilgiri tahr langur, lion tailed macaque, otter, Malabar giant squirrel, civets etc. are generally sighted. There are several kinds of poisonous and non-poisonous snakes including the king cobra.
- Tortoise may often be seen asking on rocks and tree-trunks by the lake. The Masheer, the most famous game fish of India exists in large numbers.
- The common aquatic birds are the Indian darter, little cormorant kingfisher, and the black-necked stork, the great Indian hornbill, peafowl, brahminy kite and black winged kite.

**Eravikulam National Park**

- A sanctuary for the endangered mountain goat of South India, the Nilgiri Tahr (Hemitragus hylocrious), the Eravikulam National Park Kerala stands out for the stark beauty of its rolling grasslands and sholas, spread over 97 sq km in the Rajamalai hills.
- Anamudi, the highest peak (2695 m) south of the Himalayas, towers over the sanctuary in majestic pride.
- The slopes of the hills abound in all kinds of rare flora and fauna. The Atlas moth, the largest of its kind in the world, is a unique inhabitant of the park.
- Other rare species of fauna found here are the Nilgiri Langur, the lion-tailed macaque, leopards, tigers, etc.

**Idukki National Park**

- Located in the southern state of India, Kerala, Idukki National Park is one of Kerala's finest havens for wildlife and is home to vast herds of Elephants, bisons, bear, wild boars, sambar wild dogs, jungle cats, tiger, wild boar and has a very large concentration of various species of snakes including cobra, viper, kraits and numerous non-poisonous ones.
- The bird life in the sanctuary is equally impressive. Important birds include myna, jungle fowl, black bulbul, laughing thrush, woodpecker, peafowl, kingfisher etc.
Wayanad Wildlife Sanctuary

- Established in 1973, the Wayanad Wildlife Sanctuary Kerala is contiguous to the protected area network of Nagarhole and Bandipur of Karnataka on the north-east and Mudimalai of Tamilnadu on the south-east.
- Rich in bio-diversity, the sanctuary is an integral part of the Nilgiri Biosphere Reserve, which has been established with the specific objective to save the biological heritage of the region.
- The animal population of the sanctuary is varies. Elephant, tiger, Panther, jungle cat, civet cat, monkeys, wild dog, bison, deer, bear, etc. inhabit the sanctuary.
- Reptiles like monitor lizard and a variety of snakes are seen. Peacock, babblers, cuckoos, owl, wood pecker and jungle fowl are only a few among the different types of birds seen in the area.

Bandhavgarh National Park

- This is a small National Park; compact, yet full of game. The density of the Tiger population at Bandhavgarh is the highest known in India.
- Considering the importance and potentiality of the National park, it was included in the Project Tiger Network in 1993.
- The reserve named after the highest hill Bandhavgarh (807 m) Madhya Pradesh in the centre of it, falls between the Vindhyan hill range and the eastern flank of Satpura hill range and is located in Shahdol and Jabalpur districts of Madhya Pradesh.
- There are more than 22 species of mammals and 250 species of birds. Common Langurs and Rhesus Macaque represent the primate group. Carnivores include the Asiatic Jackal, Bengal Fox, Sloth Bear, Ratel, Gray Mongoose, Striped Hyena, Jungle Cat, Leopard and Tiger.
- The artiodactyls frequently sighted are Wild Pigs, Spotted Deer, Sambar, Chausignha, Nilgai, Chinkara and Gaur. Mammals such as Dhole, the small Indian Civet, Palm Squirrel and Lesser Bandicoot Rat are seen occasionally. Among the herbivores, Gaur is the only coarse feeder.
- The vegetation along streams and marshes is rich in bird life. The common ones are Little Grebe, Egret, lesser Adjutant, Sarus Crane, Black Ibis, Lesser Whistling Teal, White-eyed Buzzard, Black Kite, Crested Serpent Eagle, Black Vulture, Egyptian Vulture, Common Peafowl, Red Jungle Fowl, Dove, Parakeets, Kingfishers and Indian Rollers.
- Reptilian Fauna include Cobra, Krait, Viper, Rat-snake, Python, Turtle and a number of lizard varieties, including Varanus.

Kanha National Park

- Kanha Tiger Reserve, comprising parts of the Mandla & Balaghat districts of Madhya Pradesh, and located in the "Maikal" hills of the Satpuras, is internationally renowned for its rich floral and faunal attributes.
- Kanha's sal and bamboo forests, rolling grasslands and meandering streams stretch over 940 sq km in dramatic natural splendour which form the core of the Kanha Tiger Reserve created in 1974 under Project Tiger.
- The park is the only habitat of the rare hardground Barasingha (Cervus Duvaceli Branderi).
- Kanha has some 22 species of mammals. Those most easily spotted are the striped Palm Squirrel, Common Langur, Jackal, Wild Pig, Chital or Spotted Deer, Barasingha or Swamp
Deer, Sambar and Black Buck. Less common species are Tiger, Indian Hare, Dhole or Indian Wild Dog, Barking Deer, Indian Bison or Gaur.

- Patient watching should reward the visitor with a sight of: Indian Fox, Sloth Bear, Striped Hyena, Jungle Cat, Leopard, Mouse Deer, Chausingha or four horned antelope, Nilgai, Ratel and Porcupine.
- The Reserve is a part of the Gondwana tract inhabited traditionally and chiefly by the Gond and Baiga tribes, the latter confining themselves largely to the upper valleys and dadars near the main Maikal range.

Madhav National Park

- Madhav (Shivpuri) National Park Madhya Pradesh 156 sq km in area, the park is open throughout the year. The park enforces the conservation which the area enjoyed when it was the private shooting reserve of the Maharaja of Gwalior.
- It was established as the Shivpuri National Park in 1958 simultaneously with the creation of the State of Madhya Pradesh. It now enjoys further protection under the Wildlife Protection Act of 1972.
- Altitude ranges from 360-480m. With a varied terrain of wooded hills, the forest being dry, mixed and deciduous with flat grasslands around the lake, offers abundant opportunities of sighting a variety of wildlife.
- The predominant species that inhabits the park is the deer, of which the most easily sighted are the graceful little Chinkara, the Indian gazelle, and the Chital.
- Other species that have their habitat in the park are Nilgai, Sambar, Chausingha or four- horned Antelope, Blackbuck, Sloth Bear, Leopard and the ubiquitous common Langur.
- Tiger Panthera tigris (occasional), leopard Panthera pardus, striped Hyaena, jackal Canis aureus, jungle cat Felis chaus) chital Axis axis, sambar Cervus unicolor, nilgai Boselaphus tragocamelus, four-horned antelope (chowsingha) Tetracerus quadricornis, wild boar Sus scrofa, chinkara (mountain gazelle) Gazella, crocodile and others.

Panna National Park

- Situated in the central Indian state of Madhya Pradesh at a distance of around 57 km from Khajuraho is the Panna National Park. The region, which is famous for its diamonds, is also home to some of the best wildlife species in India and is one of the better Tiger Reserves in the country.
- The park is known worldwide for its wild cats, including tigers as well as deer and antelope.
- Tiger (Panthera tigris), the king of the jungle, roams freely in this secure, though a bit small habitat along with his fellow beings - leopard (Panthera pardus), wild dog (Cuon alpinus), grey wolf (Canis lupus), hyaena, caracal (Felis caracal) and smaller cats.
- The wooded areas are dotted with sambar the largest of Indian deer, chital and chowsingha.
- One can easily see nilgai and chinkara in most open areas in the grasslands, especially on the periphery. Varieties of snakes, including the python and other reptiles are found here.
- The avifauna comprises more than 200 species, including a host of migratory birds. One can see white necked stork, barheaded goose, honey Buuzzard, King vulture, Blossom headed Parakeet, Paradise flycatcher, Slaty headed Scimitar babbler to name a few.
Karera Bird Sanctuary

- The Karera Bird Sanctuary is located in the central Indian state of Madhya Pradesh. The vegetation is reverie and swamp with mixed deciduous forests. Ber bushes and other wild plants are found in abundance.
- There are no trees except acacia throughout this forest. The thorny open country of the Karera Sanctuary houses the haughty Great Indian Bustard and the equally snooty blackbuck. There are many other varieties of birds and animals that have made it their habitat.
- The blackbuck and Indian gazelle are the prominent habitants of this open country. There are many migratory birds that settle here in the season. There are pintails, teals, and gadwalls snoozing in the sun or squatting meditatively in the mud.
- There are resident water birds too like the black-bellied river terns, egrets, and spoonbills. Other birds found here are herons, Indian robins, as also insects like dragonflies, damselflies, and butterflies.

Bori Wildlife Sanctuary

- Bori Wildlife Sanctuary is located in Hoshangabad District of Madhya Pradesh. This wildlife sanctuary is one of the oldest forest reserves, with an area of 518 sq kms. This wildlife reserve is conveniently placed on the northern foothills of Satpura Range.
- The sanctuary is mostly covered by mixed dry deciduous forest. Teak, dhaora, bamboo, tendu are the main vegetation in this reserve forest. There are shrubs and other climbing plants that have added to the wonderful flora of reserve.
- Different floras and vegetation of the sanctuary is the homeland for various animals like the tiger, leopard, hyena, jackal, wild dogs, and Indian fox, chital Axis, sambhar, nilgai, chinkara, gazelle, jungle cat and four horned antelopes, all of which can be seen roaming in their natural habitat.

Dajipur Bison Sanctuary

- The Dajipur Bison Sanctuary Maharashtra is situated on the border of Kolhapur and Sindhudurg districts, near the backwaters of the Radhanagari dam. Surrounded by rugged mountains and dense forests, this secluded area is completely cut-off from human habitation.
- A home to bison, wild Deers, Chital, Gawa and many more spectacular wild animals and birds, Dajipur is an exciting and beautiful holiday getaway. The forest is famous for "Gava buffalo.
- Bison, wild deer, chital, gava etc. can be spotted here. Also one can find Gagangiri Maharaja's Math in the forest area.

DHAKANA - KOLKAZ NATIONAL PARK

- Chikhaldara Wildlife Sanctuary is located in Amravati district of Vidarbha region. The only hill station in the Vidarbha region offers one an abundance of wildlife, viewpoints, lakes and waterfalls.
- This sanctuary is named after "Keechaka". This is the place where Bhima killed Keechaka and threw him into the valley. It thus came to be known as "Keechakadara" and Chikhaldara is its corruption. This is the only coffee growing area in Maharashtra.
- Tourists can find Panthers, Sloth Bears, Sambar, and Wild Boar. One can even spot Wild Dogs over here.
Close by is the famous **Melghat Tiger Project** in Dhakana-Kolkaz National Park, a natural habitat centre for about 82 tigers. Chikaldhara's cool breezy climate makes it an excellent place to repose.

**Sanjay Gandhi National Park**

- Sanjay Gandhi National Park, better known as "Borivali National Park" is set in hill ranges around the suburb of Borivali in Mumbai **Maharashtra**.
- Notified in 1974, it offers a pleasant change from the usual sights and attractions of the big city.
- One can have encounters with several species including Spotted Deer, Black Naped Hare, Barking Deer, Porcupine, Palm Civet, Mouse Deer, Rhesus Macaque, Bonnet Macaque, Hanuman Langur, Indian Flying Fox, and Sambhar. The reptilian world has 38 species to show off. Tourists can see crocodiles in the Tulsi Lake, and Pythons, Cobras, Monitor Lizards, Russell's Viper, Bamboo Pit Viper and Ceylonese Cat Snake here.

**Nokrek National Park**

- Located in West Garo Hills District in **Meghalaya**, The Nokrek National Park and **Biosphere Reserve** is about 45 kms from Tura.
- Nokrek is the **highest peak in Garo Hills** and home to different species of wild animals including Elephants and Hoolock Gibbons.
- The Nokrek National Park has been established at Nokrek and it abounds in various wildlife including **herds of wild elephants**, rare varieties of birds and pheasants, beside rare orchids.
- The park is also home to a very rare species of citrus-indica endemic to this place which the locals call memang naranag ('orange of the spirits').
- Nokrek is also believed to be the home of Mande Burung (jungle man or ape man) and reported cases of sightings abound in and around the villages of Nokrek.

**Balpakram National Park**

- It is a national wild life park, about 167 kms from Tura **Meghalaya**. It is home to one of the rarest animals in the world - the Lesser Panda or the Red Panda as it is commonly known.
- Balpakram (a place of perpetual winds) covering an area of about 220 sq km with a variety of wildlife including tigers, elephants, bison, black bear, leopards, sambar deer, situated near Baghmara in south Garo Hills district of Meghalaya. The western part of the park adjoins with Siju bird sanctuary along the banks of Simsang River.

**Dampa Tiger Reserve**

- Dampa Tiger Reserve, the biggest Wildlife Sanctuary in **Mizoram** was notified in 1985. It is situated in the western part of Mizoram state on the international border with Bangladesh about 127 km. from Aizawl.
- It covers an area of approximately 550 Sq. Km. The tropical Forests of Dampa is home to rich Flora and Fauna.
- Wildlife protected over here are **Rhesus macaque**, **Leaf monkey (Dawr)**, **Pigtail macaque(Chengker Zawng)**, **Stumptail macaque(Zawngmawt)**, **Tiger(Keipui)**, **Leopard(Keite)**, **Indian Elephant(Sai)**, **Gaur(Sele)**, **Serow(Saza)**, **Barking deer(Sakhi)**, **Wild boar(Sanghal)**, **Porcupine(Sakuh)**, **Sloth bear(Mangtir)**, **Himalayan black bear(Savawm)**, **Great Indian hornbill(Vapual)**, **Malbar pied hornbill(Vahai)**, **Peacock pheasant(Varihaw)**, **Red...
jungle fowl(Ramar), Crested serpent eagle(Muwanlai), Emerald dove(Ramparva, Hill myna(Vaiva), Python(Saphal), King Cobra(Chawngkawr), Monitor lizard(Tangkawng), and Hill Tortoise(Satel).

**Murlen National Park**

- Murlen National Park is one of the best National Parks of Mizoram. It is situated about 245 km east of Aizawl.
- This park lies close to the Indo-Myanmar and is significant because of its proximity to the Chin Hills. It covers an area of approximately 100 sq. km.
- The Tropical, Semi evergreen and Sub montane Forests of Murlen are home to a rich variety of Flora and Fauna.
- About 15 species of mammals, 150 species of birds, 35 species of Medicinal plants, 2 species of bamboos & 4 species of orchids so far have been recorded in this Park.
- The vegetation is admixture of Quercus, Schima wallichii, Betula specie, Michelia champaca, Pinus Khasia, Prunus Myrica, Rhodendron, Arundinaria callosa, Canes and variety of orchids.
- Animals like Tiger, Leopard, Sambar, Barking deer, Himalayan Black Bear, Serow, Hoolock gibbon, Rhesus macaque, Malayan giant, squirrel, Hume's Pheasant, Kallej Pheasant, Common partridges, Hill myna, dark rumped swift are found here.

**Ngengpui Wildlife Sanctuary**

- Ngengpui Wildlife Sanctuary is situated in South-Western Mizoram. It is close to Indo-Myanmar and Indo-Bangladesh border. The total area of the Sanctuary is 110 Sq. Km. and ranges in altitude from 200 meters to about 1200 meters above sea level.
- The wild animals found in this Sanctuary are Tiger, Clouded leopard, Elephant, Guar, Barking deer, Sambar, Wild boar, Hoolock Gibbon, Rhesus macaque, Leaf monkey, Common langur, etc.

**Khawnglung Wildlife Sanctuary**

- Khawnglung Wildlife Sanctuary Mizoram is situated approximately 170 km from Aizawl. It covers an area of about 35 Sq. Km. and ranges in altitude from 400m to 1300m. Animals commonly found here are Wild boars etc.

**Lenghteng Wildlife Sanctuary**

- Lenghteng Wildlife Sanctuary is situated in the Eastern part of Mizoram adjacent to Murlen National Park. The approximate area of the Sanctuary is 60 Sq. Km. and ranges in altitude from 400meters to about 2300 meters above sea level.
- Within this park is the second highest Peak in Mizoram. The important wild animals and birds found in this Sanctuary are Tiger, Leopard, Sambar, Ghoral, Serrow, Hume's Bartailed Pheasant, Kallej Pheasant, Barking deer, Wild boar, Hoolock gibbon, Rhesus macaque, etc.

**Thorangtlang Wildlife Sanctuary**

- Thorangtlang Wildlife Sanctuary is situated approximately 240 km from Aizawl via Thenzawl village in the Western Part of Mizoram and is adjacent of Dampa.
- The Sanctuary acts as a corridor for elephants which migrate from Bangladesh.
- The area of this Sanctuary is 50 Sq. Km. Important animals found in this Sanctuary are Tiger, Leopard, Hoolock gibbon, Leaf Monkey, Sambar, Barking Deer, and a variety of Birds, etc.

**Phawngpui National Park**

- Phawngpui National Park is situated in South Eastern [Mizoram](https://en.wikipedia.org/wiki/Mizoram) adjacent to Myanmar border. The [highest peak in Mizoram, the Phawngpui](https://en.wikipedia.org/wiki/Phawngpui_National_Park) (2360m) is located within this Park.
- The total area of the Park is 50 Sq. Km. The important wild animals and birds found in this Park are Ghoral, Serrow, Barking deer, Sambar, Leopard, Blyth's tragopan, Kaelej Pheasant, Hoolock Gibbon, Common Langur, Rhesus macaque, Stump tail macaque and variety of birds and orchids.

**Simlipal National Park**

- Simlipal National Park, 320 km from Bhubaneswar ([Odisha](https://en.wikipedia.org/wiki/Odisha)), is a 2,750 sq km sanctuary and a Project Tiger Reserve.
- Simlipal Tiger Reserve is located in Mayurbhanj district in the northern part of Odisha, close to the Bengal-Bihar border. It is a thick hilly area of forests spread over 2,750 sq km. It occupies an important position as the habitat of the Royal Bengal tiger.
- There are 7 major rivers. There are approximately 1,076 plant species, 231 bird species and 42 mammal species and 29 reptiles and 12 species of amphibians.
- One can find tiger, leopard, elephant, sloth bear and spotted deer. Bird species are peafowl, jungle fowl, hill hynah, eagle and parakeet. Reptiles like crocodile, lizards, turtles and cobras are commonly found.

**Nandankanan Sanctuary & National Park**

- Situated along the Kolkata-Chennai railway line near Barang railway station, the Nandankanan Zoological Park [Odisha](https://en.wikipedia.org/wiki/Odisha) was established on December 27, 1960.
- Nandan Kanan means "garden of pleasure", and this combination of zoo, botanical garden and sanctuary 20 km from Bhubaneswar, in the splendid environs of the [Chandaka Forest](https://en.wikipedia.org/wiki/Chandaka_Forest), along the rippling waters of the Kanjia Lake, fits the description.
- Within its perimeters the Zoological Park covers 362 hectares of undulating forest areas, natural wasteland and Kanjia Lake which itself covers 66 hectares.
- It nurtures 46 species of mammals, 59 species of birds and 21 species of reptiles. In addition to the white tigers, endangered species such as the Asiatic Lion, three Indian crocodilians, sanghai, lion tailed macaque, Nilgiri langur, Indian pangolin, mouse deer and countless birds, reptiles, and fish have been breeding successfully here.
- The Nandankanan Zoological Park is one of the major tourist attractions of Odisha. It has the distinction of being the [host zoo in the world for captive breeding of white tigers](https://en.wikipedia.org/wiki/Nandankanan_Zoological_Park) which originated in Rewa, Madhya Pradesh.
- Internationally acclaimed for its large collection of white tigers, Nandanakanan is also the [first-ever captive breeding centre of endangered species](https://en.wikipedia.org/wiki/Nandankanan_Zoological_Park) for creating awareness towards wildlife.
- The unique natural ambience of Nandanakanan with a wide variety of animals also serves as a rehabilitation centre of problematic wild animals. It also acts as a rescue centre for abandoned, injured and incapacitated animals.
Bhitarkanika Wildlife Sanctuary

- Bhitarkanika Wildlife Sanctuary Odisha is spread in an area of 672 square kilometers. The Sanctuary comprising mangrove forests meandering rivers, innumerable criss-crossed tidal inundated creeks provide last refuge to the already endangered salt water Crocodile (Crocodile Porosus).
- Besides estuarine Crocodile, the sanctuary is rich in avifauna, mammalian and reptilian population.
- Theses mangrove forests are good habitat for King Cobra, Indian Python and Water Monitor Lizard.
- A large number of water birds visit this area. Most of the Birds are asian openbill, egrets, black Ibis, cormorants, darters and others.

Chilka Lake Bird Sanctuary

- The Chilka Lake is situated in Puri, in Odisha. It is considered to be Asia's largest inland salt-water lagoon. The pear-shaped lake spreads across 1,100 sq km, and has a unique ecosystem with a range of aquatic flora and fauna found in and around its brackish waters.
- Other than the birds, Chilka's shores are home to blackbuck, spotted deer, golden jackals, hyenas.
- The lake is rich in aquatic life - its waters harbour around 160 species of fish, crustaceans and other marine creatures, including the famous Chilka dolphin, prawn, crab and mackerel fishing are an important source of livelihood for the local people.

Keoladeo Ghana National Park

- Keoladeo Ghana National Park Rajasthan, commonly known as Bharatpur Bird Sanctuary, It is one of the smallest parks in the country and one of the finest bird parks in the world.
- This magnificent bird haven in actual came into being paradoxically as a duck shooting preserve for Maharaja Suraj Mal of Bharatpur.
- He transformed the shallow depression formed by the confluence of river Gambhir and river Banganga into a reservoir by damming the rainwater in monsoons. Flooding of water created shallow wetland ecosystem causing it to be a perfect habitat for an astounding variety of birds.

Ranthambore National Park

- Ranthambore National Park is in Sawai Madhopur District of Rajasthan state. Ranthambhor Tiger Reserve is located at the junction of the Aravalli and Vindhya hill range, this is one of the finest places to view animals, especially as they are used to being stared at here.
- The park covers an area of Approximately 400 sq Km and if combined it with the area of Sawai Man Singh sanctuary area, it is around 500 Sq km.
- Ranthambore national park was declared a wildlife sanctuary in 1957 and in 1974 it gained the protection of “Project Tiger”. It got its status of a National Park in 1981.
- The tiger is not the only attraction at Ranthambhor. A variety of birds including owlets, the ubiquitous langur (monkey), leopard, caracal, hyena, jackal, jungle cat, marsh crocodiles, wild boar, bears and various species of deer are the other attractions.
- A significant geological feature within the park is the 'Great Boundary Fault' where the Vindhaya plateau meets the Aravali range.
The **Rivers Chambal** in the South and the **Banas in the north** bound the National Park. The park is dotted with steep rocky hills and the dominating architecture of Ranthambhor Fort (built in the 10th century), adds to its landscape.

**Sariska Tiger Reserve**

- Sariska Tiger Reserve lies in the Alwar district of the **Rajasthan** state of India. It is prime tiger country. The reserve was declared a wildlife sanctuary in 1958 and came under the "Project Tiger" as a Sariska tiger reserve in 1979.
- The forest is **typical dry deciduous**, dramatically changing with the change in season. Dhok (Anogeissus pendula) is the dominant tree species covering over 90 per cent area of the forest. Boswellia serreta and Lannea coromandelica grow at rocky patches. Kattha (Acacia Catechu) and Bamboo are common in the valleys.
- The Northern Aravali Hills dominate the skyline with their mixture of sharp cliffs and long narrow valleys. The landscape of Sariska comprises of hills and narrow valleys of the Aravali hill range.
- Sariska Park is home to numerous carnivores including Leopard, Wild Dog, Jungle Cat, Hyena, Jackal, and Tiger. These feed on an abundance of prey species such as Sambar, Chitel, Nilgai, Chausingha, Wild Boar and Langur.
- Sariska is also well known for its large population of **Rhesus Monkeys**, which are found in large numbers around Talvriksh.

**Desert National Park**

- The Desert National Park is situated in the West Indian state of **Rajasthan** near Jaisalmer. This is one of the **largest national parks**, covering an area of 3100 sq. km. The desert sanctuary being a fragile ecosystem has its own flora and fauna.
- Birdlife in this sandy habitat is vivid & spectacular. The **great Indian bustard** is another magnificent bird found in relatively fair numbers. It migrates locally in different seasons.
- The region is a haven for migratory and resident birds of the desert. One can see many eagles, harriers, falcons, buzzards, kestrel and vultures.
- Short- toed eagles, tawny eagles, spotted eagles, lagger falcons and kestrels are the commonest of these. Sandgrouses are spotted near small ponds or lakes. Sea shells and massive fossilized tree trunks in this park record the geological history of the desert.

**Khangchendzonga (High Altitude) National Park**

- Khangchendzonga (High Altitude) National Park **Sikkim** extends from the cold deserts of Lhonak Valley and the ridges of Lachen in the North District to the historical place at **Yuksom**. The Western Boundary of the park runs along the international boundary with **Tibet**.
- The park covers an area of 1,784 sq.kms and occupies as much as 25.14% of the land area of Sikkim. This area lies within reserved forests and except for a mall Tibetan Village community at Tsoka, there are no other village settlements inside the park.
- The park is a reservoir of diverse habits - including some rare and endangered species like the Snow Leopard, Red Panda, Musk Deer, Bharal or the Blue Sheep, Himalayan Tahr, the Shapi of Sikkim, Leopard, Goral Serow, Barking Deer, Lesser Cats, Tibetan Wolf, Fox, Tibetan Fox, Himalayan Black Bear and Monkeys.
Himalayan Zoological Park

- Himalayan Zoological Park **Sikkim** is spread over an area of 205 ha of mountainous land encompassing steep terrain suitable for **Musk Deer and Blue Sheep**; gentle slopes for Himalayan Black Bear, Barking Deer; a vision valley for Red Panda, Danphay-Munal (bird) and many other endangered Himalayan fauna.

- List of animals found protected here is: Himalayan Red Panda, Himalayan Black Bear, Snow leopard, **Clouded leopard, Leopard Cat**, Himalayan Palm Civet, Large Indian Civet, Marbled Cat, Musk Deer, Barking Deer, Blue Sheep, Serow, Himalayan That, Himalayan Yellow-throated Marten, Himalayan Weasel, Tibetan Wolf, Red fox, Common Otter, Common Langur, Wild Boar, Porcupine, Spotted Deer, Yak, Goral, Pheasants (8 species), Reptiles (Pythons, Snakes, Lizards), Pangolin, and Aquatic habitat dwellers.

Kyongnosla Alpine Sanctuary

- Kyongnosla Alpine Sanctuary **Sikkim** is located at a distance of 31 km east of Gangtok, the capital of Sikkim, on the way to Natu La. This 'La or pass is on the old 'silk trade route from Lhasa to Calcutta. Earlier just occupying 4 sq km, this sanctuary has now been extended.

- The sanctuary is rich both in flora and fauna. Rare, endangered ground orchids and rhododendrons interspersed among tall junipers and taller silver firs are among the important plants present.

- Rhododendron nevium the State Tree of Sikkim and Cypripedium tibeticum the ground slipper orchid on the verge of extinction have been introduced here.

- Ground flora includes different species of primulas, wild strawberries, irises, poppies and the rarely seen Panax pseudo-ginseng.

- **Medicinal plants** such as 'Kutki Picrorhiza scrophulariiflora,jatamansi Nardostachys phylum emodi and even the wild onion are not hard to see here. The lower levels of the sanctuary are occupied by the soil binding bamboo Arundinaria sp.

Fambong Lho wildlife Sanctuary

- Fambong Lho wildlife Sanctuary is located at a distance of 25 km from Gangtok town, the capital of **Sikkim**. The famous **Rumtek Monastery** is located at the southeast boundary.

- The main vegetation is Oak Quercus sp 'Katus Castanopsis sp., champ, Michelia sp. 'Kawlo Machilus sp., 'Kimbu Morus sp., thicket bamboo forests, ferns and lone fir Tsuga dumosat at Tinjurey.

- The sanctuary is also home to large number of **wild orchids, moses and Lycopodium sp. Mammals** found here are Serow, Goral, Barking Deer, Himalayan Black Bear, Red Panda, Weasels, Martens, Leopard-cat, jungle Cat, Marbled Cat, Largen Indian Civet, Palm civer, Binturong.

Arignar Anna Zoological Park

- Arignar Anna Zoological Park is situated at Vandalur which is 32 Km away from the metropolitan city of Chennai (TN). The Zoo maintains a viable population of threatened and endangered species of the Western and the Eastern Ghats.

- It has many threatened exotic species also. The Zoo plays the role of **Species Bank** and **Gene Bank** for a wide variety of flora and fauna.

- It is an **Educational Centre** and offers tremendous scope for Eco-awareness and conservation education to the public. It serves as a site for basic and applied research on
many aspects like animal behaviour, nutrition, ecology, biology, diseases and contributes significantly in conservation of Bio-diversity.

- The Zoo has the scientific and technical facilities for propagation and introduction of endangered species to its original habitat.

**Indira Gandhi Wildlife Sanctuary**

- Indira Gandhi Wildlife Sanctuary (TN) and National Park formerly called Anamalai Wildlife Sanctuary is a protected area named after Prime Minister Indira Gandhi who visited here on October 7, 1961.
- An Ecological Paradise, this sanctuary encompasses a National Park with an area of 108 sq.km.
- About 800 species of South Indian flora are distributed here. This sanctuary *nurtures arboreal animals like lion tailed macaque, bonnet macaque, common langur, nilgiris langur, malabar giant squirrel and grizzled giant squirrel.*
- The ground animals listed are: Tiger, Panther, Elephant, Gaur, Pangolin, Sambar, Spotted Deer, Barking Deer, Mouse Deer, Wild Boar, Dhole, Sloth Bear, Porcupine, Nilgiris Tahr, Civet Cat and Toddy Cat.
- The Avifauna includes Racket Tailed Drongo, Black Headed Oriole, Paradise Flycatcher, Whistling Thrust, Emerald Dove, Green Pigeon, Tickell's Flower Pecker, Rufus Wood Pecker, Rose Ringed Parakeet, Black Eagle, Great Indian Malabar pied Horn Bill, Fiary Blue Bird and green Billed Malkoha etc.

**Srivilliputhur Grizzled Squirrel Wildlife Sanctuary**

- The Grizzled Squirrel Wildlife Sanctuary at Srivilliputhur in southern Tamil nadu, was declared as a sanctuary in December 1989.
- It spreads over 480 sq. KM. This sanctuary is contiguous to Periyar Tiger Reserve on the South western side and the **Megamalai Reserve Forest** on the north western side and its southern limit is contiguous with the Sivagiri Reserved Forest of Tirunelveli Forest Division.
- The sanctuary has a wide range of habitats - from the higher elevation Upper Montane forests and grasslands, mid elevation Wet Evergreen, Semi Evergreen, Moist Deciduous, Open Deciduous, Closed Deciduous forests and grasslands with scrub jungles in the foot hills.
- There is a wide range of herbivores, carnivores and omnivores in the Grizzled Squirrel Sanctuary. Resident and migrating elephants are common.
- The **other important animals are Tiger, Leopard, Gaur, Nilgiri tahr, Spotted deer, Barking deer, Sambar, Wild-boar, Porcupine, Nilgiri langur, Lion-tailed macaque, Common langur, Slender loris, Bonnet macaque, Sloth bear, Indian Giant Squirrel and Flying Squirrel.** The Sanctuary has 18 species of snakes, 15 species of lizards, over 10 species of amphibians and over 56 species of butterflies now.

**Guindy National Park**

- Guindy National Park is situated in the Mambalam, Guindy taluk in Chennai(TN). It is spread over an area of 270 hectares of dry evergreen scrub and thorn forests and is the smallest national park in the country.
- Guindy National Park is home to **400 black bucks, 2000 spotted deer, 24 jackals, a variety of snakes,** geckos, a wide variety of snakes tortoises, geckos and over 100 species of birds, over 60 species of butterflies and spiders each, a wealth of different invertebrates-grasshoppers, ants, termites, crabs, snails, slugs, scorpions, mites, spiders, earthworms,
millipedes, etc A snake park within this park supports a variety of snakes, crocodiles and turtles.

- About 22 acres of GNP has been carved out into a zoo for **ex-situ conservation**. This entails keeping different species in captivity on view to public.
- Children's park - the zoo was started with the idea of providing children a natural environment, to educate them about animals and create awareness on conservation.

**Gulf of Mannar Marine National Park**

- The Gulf of Mannar Marine National Park *(TN)* has the core area of about 560 sq KM from Rameswaram to Tutucorin lying within the Gulf of Mannar Biosphere Reserve covering an area of 10,500 Sq KM. on the south-east coast of India.
- It covers the coast of Rameswaram, Tutucorin, Tirunelveli and Kanyakumari. It is one of the world’s richest regions from marine bio diversity perspective and the first marine Biosphere Reserve in Southeast Asia.
- The **Biosphere Reserve** comprises 21 islands with estuaries, mudflats, beaches, forests of the near shore environment, including marine components like algal communities, sea grasses, coral reefs, salt marshes and mangroves.
- In each island, straight line-transect ranging from 500-1000 m depending upon the size and shape of the island and a plots of 15 m radius were laid at equal intervals and visual estimation of the vegetation types at species level and area covered were recorded in each transect.
- This was then extrapolated to find out the vegetation cover of each island. While introduced Prosopis was found to be dominant tree species in all islands, Pemphis acidula was the only endemic species in the island group of GOMMN. A total of 10 true mangrove and 24 mangrove associated species were recorded from these islands.
- A total of 92 wild and 9 introduced species of vegetation were recorded in the islands. **Peculiar animal like Balanoglosses** living -fossil linking invertebrates and vertebrates is endemic here.
- Sandy shores of islands is feeding ground for five endangered marine turtles - **Green turtle**, **Olive ridley turtle**, **Hawksbill turtle**, **Leatherback turtle and Loggerhead turtle** and the first two breed here too.

**Kalakkadu Wildlife Sanctuary**

- It is situated in an area of 223 sq kms in the Thirunelveli District *(TN)*, at the foothills of Western Ghats and the adjoining areas.
- The flora ranges from forests of the tropical wet evergreen to the tropical dry deciduous and thorn forests in the lower hills.
- Kalakkadu wildlife sanctuary is **very popular with botanists and ornithologists** as it has a great variety of fauna and bird lives.
- The Lion tailed Macaque, Nilgiri Langur, Bonnet Macaque, Common Langur, Nilgiri Tahr, Sambhar, Sloth Bear, Gaur, Elephant, Tiger, Flying Squirrel, Panther, Wild Dog and Pangolin are some of the wild life seen in this sanctuary.

**Point Calimere Wildlife Sanctuary**

- Point Calimere Wildlife Sanctuary was created in **1967 for conservation of Blackbuck**, an **endangered and endemic species of India**. The sanctuary is located in Nagapattinam district of Tamil Nadu.
This vast swampy tract of Point Calimere is the scene of one of India's greatest avian spectacles. Point Calimere encompasses 17.26 sq KM of sandy coast fringed by saline swamps and thorny scrub around the backwaters.

Point Calimere is associated with Hindu religion and mythology. The forests of Point Calimere, earlier known as Vedaranyam forests, mean forests (aranyam) of the Vedas (sacred text of the Hindus).

The climate of the area is monsoonal, but it is not typical of monsoonal climates due to its asymmetrical rainfall regimes. The main contribution to the rainfall is from the Northeast Monsoon, and to a lesser degree, the Southwest Monsoon.

Blackbuck, locally called Velimann, is the key species of the sanctuary. They are mostly seen grazing in the open grassland area.

Other important animals of the sanctuary include spotted deer, Jackal, Civet, Wild boar, Jungle Cat, Bonnet Macaque, Black-naped Hare and the Common Indian Mongoose. A notable feature of the sanctuary is the presence of feral horses.

**Mudumalai Wildlife Sanctuary**

Mudumalai Wildlife Sanctuary & National Park (TN) is situated at the tri-junction of Tamil Nadu, Kerala and Karnataka on the North Eastern Slopes of the Nilgiris part of Western Ghats descending to the Mysore Plateau.

With Bandipur Tiger Reserve (Karnataka) in the north and Wynad Wildlife Sanctuary (Kerala) in the west the region forms a single, continuous viable habitat for a varied range of wildlife and is a part of the Nilgiri Biosphere Reserve.

Dawn is the time of day when birds are most active and at their chirpiest best. River and stream margins are good places to listen to bird choruses. Reptiles are also well represented.

There are several species of poisonous and non-poisonous snakes, including python. Some pythons are so large that they do not hesitate to throw their coils round medium sized deer and bison calf.

The Flying lizard is a rare and interesting reptile that is found in the sanctuary. Animals that are commonly seen by casual visitor are spotted deer, Elephants, Common langur, an occasional Sambhur and Gaur.

**Mukurthi National Park**

Mukurthi National Park is another major attraction of the Nilgiris (TN). It is located on the south eastern corner of the Nilgiris Plateau. The area contains a viable population of Nilgiri Thar (Hemitragus hylocrius).

It is spread over an area of 78.46 km. A fascinating feature of the Mukurthi National Park is its endemism and relationship with the Himalayan flora and fauna.

The natural vegetation consists of vast stretches of grasslands interspersed with numerous isolated, compact sharply defined and small woodland "Shoals". Only two storeys of tree layers are seen.

Lianas are quite common, Epiphytes are abundant and consists mostly of lichens, ferns, bryophytes and various orchids. Several plants native to Nilgiris plateau have their nearest relatives in the Himalayas. The Rhododendrons, Black berries, Raspberries etc. are not found anywhere in peninsular India, between the Nilgiris and the Himalayas.

Mukurthi’s wild animals are a fascinating mixture of plain and mountain animals. The close encounters with wild animals, are rare in the open Mukurthi Country.

The common mammalian species met with here include Nilgiri Tahr Sambar, Barking deer, Elephant, Blacknaped hare, Jungle cat, Wild dogs, Jackal, Stripe-necked

**crackIAS.com**
mangeose, Nilgiri Martin, Otters, Giant squirrel etc., The Avifauna are mostly hill birds, such as Kestrel, Black Eagles, Grey jungle fowls, wood cock and Thrushes.

Mundanthurai Wildlife Sanctuary

- The Mundanthurai-Kalakad wildlife sanctuary in Tirunelveli district (TN) is developed as a National Tiger Reserve from the year 1988 with a total area of 817 sq. km in the southmost western ghat ranges.
- The nearest stations are Cheranmahadevi, and Ambasamudaram which are 20kms and 15 kms respectively from Tirunelveli. The mountainous undulating to topography is the characteristic feature leading to tropical dry deciduous forest on the lower slopes and tropical wet evergreen forests on the upper reaches.
- The climate is dry, humid and hot at plains and pleasant cold in the higher elevations. The reserve is the southernmost habitat of the tiger. Other predators like panthers, jungle cats, civets, dholes, jackals, striped hyenas are also found here.
- We can also come across reptiles and amphibians like king cobra, common krait, russels, viper, darkpit viper, monitor lizard, garden lizard, tortoise, crocodiles and rare species of frogs. Regarding avifauna there are more than 80 species of birds found in this region.
- To mention a few spotted frequently here are egrets, herons, jungle fowl, spur fowl, partridge, quails, emerald dove, minivets, bee eaters, sparrows, owls, night jars, kites, paradise flycatchers, and parakeets etc.
- There are 24 identified nature trails which are spread over the reserve. It gives a thrilling experience to trekkers.

Vedanthangal National Park

- Vedanthangal bird sanctuary (TN) is one of the smallest and oldest in the country with a unique history.
- The local people have been protecting the sanctuary for centuries now because they have realized that the bird droppings falling into the tank increases nitrogen content of the water and when used to irrigate crop increases the yield greatly and saves the cost of fertilizers.
- As far back as 1798, the village folk convinced the authorities to give protection to the birds of the 30 ha area of the Vedanthangal tank.
- Around 30000 birds come every season even though the area is just 30 ha It then attracts multitudes of herons, egrets, storks, ibises and spoon bills.
- If the monsoon is heavy, these trees can be partially submerged. Despite its compact size, Vedanthangal is worth a visit, especially between October and January, for the experience of seeing nesting birds in the thousand within close range.
- One of the first birds to arrive at Vedanthal are Open billed storks and breed twice during the same season before leaving the sanctuary.
- Egrets, Spot billed pelican, Painted stork, Great cormorant, Indian Cormorant, Darter, Eurasian spoonbill, Asian open bill, Black-headed Ibis, Grey Heron, Purple Heron, Great Egret are seen in large numbers.
- Some of the other commonly seen waterfowl are the white ibis, night heron, darter, pond heron and ducks like Comb duck, pintails, common teals, dabchick, shoveller, and black-winged stilt.
Sepahijala Wildlife Sanctuary

- Sepahijala Wildlife Sanctuary **Tripura** was constituted on 2nd February 1987. The sanctuary has 456 plant species of monocotyledon and dicotyledon. Trees of Sal, Chamal, Garjan and Kanak exist predominantly.
- The secondary species consist of Pichla, Kurcha, Awla, Bahera, Hargaja, Amlaki, Bamboos and grasses.
- Sanctuary has the 4489 cum per ha.of timber biomass. Sanctuary has abundant Rauwalia serpentina and home to other endangered and endemic species.
- Agar (aggeria agglocha) (the state tree), Nageshwar (Mesua ferrea- state flower), Dukul (the green Imperial peigion-state bird) and groups of Spectacled langur (Phary's leaf monkey-State animal) Spectacle monkeycan easily be sighted inside the sanctuary area.
- **Tropical moist deciduous Forest** of Sepahijala harbours five different species of primates like Rhesus macaque, pigtailed macaque, Capped langur, spectacled langur, slow Lories and a lot of many other wild animals.
- More than 100 species of birds are found here. Wonderful habitat of Sepahijala attracts lot of migratory birds of which lesser whistling teal, white ibis, open billed stork is of prime importance.

Trishna Wildlife Sanctuary

- Trishna wildlife Sanctuary **Tripura** was notified in the year November 1988. Total area of the Sanctuary is 194.704 Sq. Km. **Trishna Sanctuary** has diversity in its floral and faunal contents.
- The Sanctuary is famous for Bison locally known as "Gaba" and home to several species of "Primates".
- Sanctuary has a numbers of perennial water rivulets, water bodies, and grass land. One species of Bamboo (Oxtenanthera Nigrocellitate) locally known as Kaillai is plenty here, leaves of which are liked by Bison.

Gumti Wildlife Sanctuary

- Gumti Wildlife Sanctuary is the second sanctuary of the South Tripura district located in the south-east corner of the state **Tripura**. Its area is 389.54 km. Close to the sanctuary, there is a vast water reservoir covering almost 300 sq km of an area.
- This water reservoir attracts several resident and migratory water birds. **Gumti Wildlife Sanctuary in Tripura** has Elephants, Bison, Sambar, Barking deer, Wild goat or Sarow apart from many other animals and reptiles.
- This is a very ideal destination for the tourists interested in eco-tourism. The sanctuary boasts of a rich flora and fauna. One can find numerous medical and therapeutical botanical species in abundance in the surroundings of the sanctuary.

Rowa Wildlife Sanctuary

- Rowa Wildlife Sanctuary, situated in the north of the district, can be approached from Panisagar and is adjacent to the National Highway.
- Rowa Wildlife Sanctuary in **Tripura** is a small wildlife sanctuary covering an area of 85’85 hectares and it is one of the few remains of the natural forests left. This sanctuary is easily accessible to the tourists from all around.
- Rowa Wildlife Sanctuary provides plenty of scope for study by the botanists, ecologists, environmentalist and students of wildlife system.
Rowa Wildlife sanctuary provides shelter to numerous species of birds, wild animals as well as primates and reptiles. Ornithologists, etymologists, botanists as well as wildlife enthusiasts have a merry time exploring the sanctuary and its offerings.

Assan Barrage Bird Sanctuary

- The Assan Barrage Uttarakhand, popularly known as Dhalipur Lake, was created in the year 1967 as a result of the construction of Assan barrage at the confluence of the river Yamuna & Assan through Dhalipur power house.
- Assan Barrage is famous for bird watching.
- The Assan reservoir attracts 53 species of water birds of which 19 are winter migrants from Eurasia.
- During winter months 90% of the water bird population comprises the following 11 migratory species, namely Brahminy Duck, Pintail, Red Crested Pochard, Gadwall, Common Pochard, Mallard, Coot, Wigeon, Common Teal, Tufted Duck, and Shoveller.

Corbett National Park

- Corbett has aptly been described as the land of the Roar, Trumpet and Song. It represents a scene of remarkable beauty. Corbett National Park lies in two districts - Nainital and Pauri - in the hill state of Uttarakhand in northern India.
- It covers an area of 521 sq. km and together with the neighbouring Sonanadi Wildlife Sanctuary and Reserve Forest areas, forms the Corbett Tiger Reserve over 1288 sq. km.
- Corbett had the proud distinction of being chosen as the venue for the inauguration of Project Tiger in India. The rich biodiversity of the Reserve is partly attributed to the variety of habitat found here.
- Due to the location of the Reserve in the foothills of the Central Himalayas both Himalayan and peninsular flora and fauna is found in the Reserve.
- Corbett is the site for three nationwide conservation projects aimed at saving prominent endangered species from extinction and providing a safe habitat for them. These are: Project Tiger, Crocodile Conservation Project, and Project Elephant.
- There is a great diversity in the fauna of Corbett National Park, you can find more than 575 Species of birds, 25 Species of reptiles, 50 species of mammals and 7 species of amphibians abundant food sources and shelter and protection from human disturbance for over half a century.
- Some of the major mammals that can found in Corbett National Park are Chital, Elephant, Wild pig, Barking Deer, Sambar, Tiger, Common Langur, Rhesus Macaque, Jackal, and Leopard Panther etc.

Govind National Park

- The Govind Wildlife Sanctuary, situated in the Uttarkashi district of Uttarakhand, was established on 1st March, 1955. It spreads over an area of 957.969 sq. kms. The entire area of the national park is subjected to light to heavy snowfall.
- The area is home for a lot of endangered animals and its large area along with the contiguous forests of the neighbouring forest divisions helps in maintaining genetic diversity. The area is very rich in medicinal plants, many of which form the basis for certain life saving drugs.
- Over 15 species of mammals and 150 species of birds exists in the sanctuary. The important mammals are Snow leopard, Black bear, Brown bear, Musk deer, Bharal, Himalayan Thar, Serow and Common leopard.
- **Snow Leopard** inhabits inner Himalayas above altitude of 3500 m. In the Eighth Plan, the Govt. of India launched the Snow Leopard Project for the long term conservation of this elusive cat.
- The endangered birds found in the area are Monal pheasant, Koklas pheasant, Western Tragopan, Himalayan Snow cock, Golden eagle, Steppe eagle, Black eagle and Bearded vulture. Other important bird groups are pigeons, parakeets, cuckoos, owls, minivets, bulbul, tits, warblers, thrushes, finches, buntings, etc.

**Nandadevi National Park**

- The Sanctuary has been converted to a National Park **Uttarakhand** and temporarily closed for visitors on environmental considerations. It has an average altitude exceeding 4500 m., and is surrounded by as many as seventy lofty peaks, the **Nandadevi (7817 m.) being the highest.**
- It is in the form of cup with lush green meadows, white waterfalls, and rich wild flora and fauna.
- Sir Edmund Hillary described the Sanctuary as a god-gifted wilderness - India's training ground for adventure - and truly so.
- The wildlife to be found in the park include Snow Leopard, Brown and Himalayan Black Bears, Bharal, Himalayan Tahr, Serow, Monal and Chir Pheasants.

**Valley of Flowers National Park**

- Valley of Flowers National Park is nestled in the Himalayan ranges of **Uttarakhand.** The park spreads over an area of 87.50 sq km and was declared as a **national park** in the year 1982.
- In 1988, **UNESCO** declared Valley of Flowers National Park of India, together with Nanda Devi National Park, as Nanda Devi and Valley of Flowers National Park **World Heritage Site.** The altitude of the park ranges between 3,250 m and 6,750 m.
- Over 300 species of wild flowers can be seen at the Valley of Flowers National Park. These include Marsh Marigold, Lilium, Campanula, Pedicularis, Arisaema, Geranium, Bistorta, Ligularia, Epilobium, Rhododendrons, Corydalis, Inula, Braham Kamal, Cypripedium, etc. The wildlife found comprises of Snow Leopard, Himalayan Bear, Himalayan Mouse Hare, Musk Deer, Blue Sheep, etc. A number of butterfly species also inhabit this park.

**Dudhwa National Park**

- **Dudhwa (UP)** spreads over 811 sq. kms near the border of India and Nepal encompassing Northern tropical semi evergreen forests, moist deciduous forests, moist Savannah forests and tropical, seasonal swamp forests.
- One of the rarest species of deer is found in this area. The Swamp deer are supposed to number 1,500. There are at least 37 species of mammals, 16 species of reptiles and 400 species of avifauna.
- **Dudhwa is said to have 101 tigers and 4 leopards.** Recently the Hispid Hare has been sighted from this area.
- In 1984, major rhino rehabilitation project was started here. Dudhwa came under Project Tiger in 1988.
- The Reserve has a range of fascinating wildlife. Included are sloth bear, rattle, civet, jackal, the lesser cats like the leopard cat, fishing cat and jungle cats; varieties of deer - the beautiful spotted deer or chital, hog deer and barking deer.
A bird watchers' haven, Dudhwa is also noted for its wide variety—about 400 species. Its swamps and several lakes attract varieties of waters fowl. Being close to the Himalayan foothills, Dudhwa also gets its regular winter visitors - the migratory water birds.

**National Chambal Sanctuary**

- The National Chambal Sanctuary, located in **Etawah, near Agra** is spread over an area of 635 sq. kms. Established in 1979, the park has a rare collection of exotic rarely found species.
- The unusual gangetic dolphin is the main attraction of National Chambal sanctuary.
- The rare Gangetic dolphin is the main attraction of National Chambal Sanctuary. The other inhabitants of this sanctuary are magar (crocodile) and gharial (alligator), chinkara, sambar, nilgai, wolf and wild boar.
- Founded in 1979 the sanctuary is a part of a large area co-administered by Rajasthan, Madhya Pradesh and Uttar Pradesh.

**Buxa Tiger Reserve**

- Buxa Tiger Reserve lies in Alipurduar sub-division of Jalpaiguri district of **West Bengal**. Buxa nestled in the eastern Himalayan foothills with sprawling Terai landscapes and tea gardens encompass 759.26 sq. kms.
- In this mosaic of evergreen wet mixed, dry mixed, hill and riverine forests that border Assam and Bhutan live a rich selection of flora and fauna. The core area is 315 sq. kms.
- **Project Tiger was launched in February 1983** but demarcation of the area took place in 1986 and only in 1992 did the Core and buffer come into the control of the field director.
- In the Reserve 390 species of birds, 73 species of mammals, 76 species of snakes, 5 species of amphibians have been identified so far.
- The area is an abode of endangered species like **Asian Elephant, Tiger, Gaur, Wild boar, Sambar**.
- In the Reserve 390 species of birds, 73 species of mammals, 76 species of snakes, 5 species of amphibians have been identified so far.
- More than 300 species of trees, 250 species of shrubs, 400 species of herbs, 9 species of cane, 10 species of bamboo, 150 species of orchids, 100 species of grass and 130 species of aquatic flora including more than 70 sedges (Cyperaceous) have been identified so far. There are more than 160 species of other monocotyledons and ferns.

**Sunderbans National Park**

- The Sunderbans **West Bengal** covers 10,000 km2 of land and water (more than half of it in India, the rest in Bangladesh) in the Ganges delta. It contains the **world's largest area of mangrove forests**.
- A number of rare or endangered species live in the park, including tigers, aquatic mammals, birds and reptiles.
- A **UNESCO World Heritage Site**, the Sunderbans is a vast area covering 4264 square km in India alone. The Indian Sunderbans forms the largest Tiger Reserve and National Park in India.
- The Sunderbans forest is home to more than **250 tigers**. The Bengal Tigers have adapted themselves very well to the saline and aqua environs and are **extremely good swimmers**. Also there are **chital deer and rhesus monkey**.
- The aqua fauna of Sunderbans include a variety of fishes; red fiddler crabs and hermit crabs. There are crocodiles, which can be often seen along the mud banks. Sunderbans National Park is also noted for its conservation of the Ridley Sea Turtle.
- There is an incredible variety of reptiles also found in Sunderbans, which includes king cobra, rock python and water monitor.
- The endangered river Terrapin, Batagur baska is found on the Mechua Beach, while the Barking Deer is found only in Holiday Island in Sunderbans.

Wandur National Park

- Wandur National Park comprises of about 12 islands and is located about 30 km southwest of Port Blair, the capital city of Andaman and Nicobar Islands and are also the home to India's best marine parks.
- Most of the islands in the park are densely forested; the open spaces are covered with scrub and creepers.
- A casual glance around and one can spot brilliant tropical flowers including orchids, broken branches and fallen leaves spread over the jungle pathways. One can also hear the bird calls, but unless in the open, it is difficult to spot the terns, gulls, ospreys, serpent crested eagles, wood pigeons and of course the swifts.
- The most striking feature of all these islands is the vegetation. Very dense, it comes right down to the shore, seeming to merge into the sea. Branches and creepers overhang and dip into the seawater.

NATIONAL PARKS OF INDIA

India's first national park (an IUCN category II protected area) was established in 1935 as Hailey National Park, now known as Jim Corbett National Park. By 1970, India only had 5 national parks. In 1972, India enacted the Wildlife Protection Act and Project Tiger to safeguard the habitats of conservation reliant species. Further federal legislation strengthening protections for wildlife was introduced in the 1980s. All national park lands encompass a combined 38,029.18 km², 1.16% of India's total surface area.

<table>
<thead>
<tr>
<th>NAME</th>
<th>STATE</th>
<th>YEAR</th>
<th>AREA (Km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corbett National Park</td>
<td>Uttarakhand</td>
<td>1936</td>
<td>520</td>
</tr>
<tr>
<td>Kanha National Park</td>
<td>Madhya Pradesh</td>
<td>1955</td>
<td>940</td>
</tr>
<tr>
<td>Tadoba National Park</td>
<td>Maharashtra</td>
<td>1955</td>
<td>116</td>
</tr>
<tr>
<td>Madhav National Park</td>
<td>Madhya Pradesh</td>
<td>1959</td>
<td>375</td>
</tr>
<tr>
<td>Mount Abu Wildlife Sanctuary</td>
<td>Rajasthan</td>
<td>1960</td>
<td>288</td>
</tr>
<tr>
<td>Panna National Park</td>
<td>Madhya Pradesh</td>
<td>1973</td>
<td>542</td>
</tr>
<tr>
<td>Bandipur National Park</td>
<td>Karnataka</td>
<td>1974</td>
<td>874</td>
</tr>
<tr>
<td>Bannerghatta National Park</td>
<td>Karnataka</td>
<td>1974</td>
<td>104</td>
</tr>
<tr>
<td>Kaziranga National Park</td>
<td>Assam</td>
<td>1974</td>
<td>471</td>
</tr>
<tr>
<td>Gir National Park</td>
<td>Gujarat</td>
<td>1975</td>
<td>258</td>
</tr>
<tr>
<td>Navegaon National Park</td>
<td>Maharashtra</td>
<td>1975</td>
<td>133</td>
</tr>
<tr>
<td>Pench National Park, Madhya Pradesh</td>
<td>Madhya Pradesh</td>
<td>1975</td>
<td>292</td>
</tr>
<tr>
<td>Pench National Park</td>
<td>Maharashtra</td>
<td>1975</td>
<td>257</td>
</tr>
<tr>
<td>Dalma Wildlife Sanctuary</td>
<td>Jharkhand</td>
<td>1975</td>
<td>195</td>
</tr>
<tr>
<td>Blackbuck National Park, Velavadar</td>
<td>Gujarat</td>
<td>1976</td>
<td>34</td>
</tr>
<tr>
<td>Guindy National Park</td>
<td>Tamil Nadu</td>
<td>1976</td>
<td>2</td>
</tr>
<tr>
<td>Nandankanan National Park</td>
<td>Orissa</td>
<td>1976</td>
<td></td>
</tr>
<tr>
<td>Dudhwa National Park</td>
<td>Uttar Pradesh</td>
<td>1977</td>
<td>490</td>
</tr>
<tr>
<td>National Park</td>
<td>State</td>
<td>Year</td>
<td>Number</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>----------------</td>
<td>------</td>
<td>--------</td>
</tr>
<tr>
<td>Keibul Lamjao National Park</td>
<td>Manipur</td>
<td>1977</td>
<td>40</td>
</tr>
<tr>
<td>Khangchendzonga National Park</td>
<td>Sikkim</td>
<td>1977</td>
<td>1784</td>
</tr>
<tr>
<td>Eravikulam National Park</td>
<td>Kerala</td>
<td>1978</td>
<td>97</td>
</tr>
<tr>
<td>Mollem National Park</td>
<td>Goa</td>
<td>1978</td>
<td>107</td>
</tr>
<tr>
<td>Vansda National Park</td>
<td>Gujarat</td>
<td>1979</td>
<td>23</td>
</tr>
<tr>
<td>Van Vihar National Park</td>
<td>Madhya Pradesh</td>
<td>1979</td>
<td>4</td>
</tr>
<tr>
<td>Desert National Park</td>
<td>Rajasthan</td>
<td>1980</td>
<td>3162</td>
</tr>
<tr>
<td>Gulf of Kachchh Marine National Park</td>
<td>Gujarat</td>
<td>1980</td>
<td>162</td>
</tr>
<tr>
<td>Gulf of Mannar Marine National Park</td>
<td>Tamil Nadu</td>
<td>1980</td>
<td>6</td>
</tr>
<tr>
<td>Ranthambore National Park</td>
<td>Rajasthan</td>
<td>1980</td>
<td>392</td>
</tr>
<tr>
<td>Simlipal National Park</td>
<td>Orissa</td>
<td>1980</td>
<td>845</td>
</tr>
<tr>
<td>Dachigam National Park</td>
<td>J &amp; K</td>
<td>1981</td>
<td>141</td>
</tr>
<tr>
<td>Hemis National Park</td>
<td>J &amp; K</td>
<td>1981</td>
<td>4100</td>
</tr>
<tr>
<td>Indravati National Park</td>
<td>Chhattisgarh</td>
<td>1981</td>
<td>1258</td>
</tr>
<tr>
<td>Keoladeo National Park</td>
<td>Rajasthan</td>
<td>1981</td>
<td>28</td>
</tr>
<tr>
<td>Kishtwar National Park</td>
<td>J &amp; K</td>
<td>1981</td>
<td>400</td>
</tr>
<tr>
<td>Sanjay National Park</td>
<td>Chhattisgarh</td>
<td>1981</td>
<td>1471</td>
</tr>
<tr>
<td>Sanjay National Park</td>
<td>Madhya Pradesh</td>
<td>1981</td>
<td>466</td>
</tr>
<tr>
<td>Satpura National Park</td>
<td>Madhya Pradesh</td>
<td>1981</td>
<td>585</td>
</tr>
<tr>
<td>Bandhavgarh National Park</td>
<td>Madhya Pradesh</td>
<td>1982</td>
<td>448</td>
</tr>
<tr>
<td>Kanger Ghati National Park (Kanger Valley)</td>
<td>Chhattisgarh</td>
<td>1982</td>
<td>200</td>
</tr>
<tr>
<td>Nanda Devi National Park</td>
<td>Uttarakhand</td>
<td>1982</td>
<td>630</td>
</tr>
<tr>
<td>Periyar National Park</td>
<td>Kerala</td>
<td>1982</td>
<td>350</td>
</tr>
<tr>
<td>Sariska National Park</td>
<td>Rajasthan</td>
<td>1982</td>
<td>273</td>
</tr>
<tr>
<td>Sirohi National Park</td>
<td>Manipur</td>
<td>1982</td>
<td>0.41</td>
</tr>
<tr>
<td>Valley of Flowers National Park</td>
<td>Uttarakhand</td>
<td>1982</td>
<td>87</td>
</tr>
<tr>
<td>Fossil National Park</td>
<td>Madhya Pradesh</td>
<td>1983</td>
<td>0.27</td>
</tr>
<tr>
<td>Mahatma Gandhi Marine National Park (prev:</td>
<td>Andaman &amp; Nicobar</td>
<td>1983</td>
<td>281</td>
</tr>
<tr>
<td>Wendur National Park)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Namdapha National Park</td>
<td>Arunachal Pradesh</td>
<td>1983</td>
<td>1985</td>
</tr>
<tr>
<td>Rajaji National Park</td>
<td>Uttarakhand</td>
<td>1983</td>
<td>820</td>
</tr>
<tr>
<td>Sanjay Gandhi/ Borivili National Park</td>
<td>Mumbai, Maharashtra</td>
<td>1983</td>
<td>86</td>
</tr>
<tr>
<td>Great Himalayan National Park</td>
<td>Himachal Pradesh</td>
<td>1984</td>
<td>754</td>
</tr>
<tr>
<td>Silent Valley National Park</td>
<td>Kerala</td>
<td>1984</td>
<td>89</td>
</tr>
<tr>
<td>Sundarbans National Park</td>
<td>West Bengal</td>
<td>1984</td>
<td>1330</td>
</tr>
<tr>
<td>Balphakram National Park</td>
<td>Meghalaya</td>
<td>1986</td>
<td>220</td>
</tr>
<tr>
<td>Betla National Park</td>
<td>Jharkhand</td>
<td>1986</td>
<td>231</td>
</tr>
<tr>
<td>Mouling National Park</td>
<td>Arunachal Pradesh</td>
<td>1986</td>
<td>483</td>
</tr>
<tr>
<td>Neora Valley National Park</td>
<td>West Bengal</td>
<td>1986</td>
<td>88</td>
</tr>
<tr>
<td>Nokrek National Park</td>
<td>Meghalaya</td>
<td>1986</td>
<td>47</td>
</tr>
<tr>
<td>Anshi National Park</td>
<td>Karnataka</td>
<td>1987</td>
<td>250</td>
</tr>
<tr>
<td>Gugamal National Park</td>
<td>Maharashtra</td>
<td>1987</td>
<td>361</td>
</tr>
<tr>
<td>Kudremukh National Park</td>
<td>Karnataka</td>
<td>1987</td>
<td>600</td>
</tr>
<tr>
<td>Middle Button Island National Park</td>
<td>Andaman &amp; Nicobar</td>
<td>1987</td>
<td>0.64</td>
</tr>
<tr>
<td>Mount Harriet National Park</td>
<td>Andaman &amp; Nicobar</td>
<td>1987</td>
<td>46</td>
</tr>
<tr>
<td>North Button Island National Park</td>
<td>Andaman &amp; Nicobar</td>
<td>1987</td>
<td>0.44</td>
</tr>
<tr>
<td>Pin Valley National Park</td>
<td>Himachal Pradesh</td>
<td>1987</td>
<td>675</td>
</tr>
<tr>
<td>Saddle Peak National Park</td>
<td>Andaman &amp; Nicobar</td>
<td>1987</td>
<td>32</td>
</tr>
<tr>
<td>South Button Island National Park</td>
<td>Andaman &amp; Nicobar</td>
<td>1987</td>
<td>0.03</td>
</tr>
<tr>
<td>Kanwar Lake Bird Sanctuary</td>
<td>Bihar</td>
<td>1987</td>
<td>67</td>
</tr>
<tr>
<td>Bhitaranika National Park</td>
<td>Orissa</td>
<td>1988</td>
<td>145</td>
</tr>
<tr>
<td>Rajiv Gandhi National Park (prev: Nagarhole)</td>
<td>Karnataka</td>
<td>1988</td>
<td>643</td>
</tr>
<tr>
<td>Gangotri National Park</td>
<td>Uttarakhand</td>
<td>1989</td>
<td>1552</td>
</tr>
<tr>
<td>Indira Gandhi National Park (prev: Annamalai)</td>
<td>Tamil Nadu</td>
<td>1989</td>
<td>117</td>
</tr>
<tr>
<td>Sri Venkateswara National Park</td>
<td>Andhra Pradesh</td>
<td>1989</td>
<td>353</td>
</tr>
<tr>
<td>Sultanpur National Park</td>
<td>Haryana</td>
<td>1989</td>
<td>1.43</td>
</tr>
<tr>
<td>Name</td>
<td>State</td>
<td>Year</td>
<td>Area (Km²)</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>----------------</td>
<td>------</td>
<td>------------</td>
</tr>
<tr>
<td>Valmiki National Park</td>
<td>Bihar</td>
<td>1989</td>
<td>335</td>
</tr>
<tr>
<td>Govind Pashu Vihar</td>
<td>Uttarakhand</td>
<td>1990</td>
<td>472</td>
</tr>
<tr>
<td>Manas National Park</td>
<td>Assam</td>
<td>1990</td>
<td>500</td>
</tr>
<tr>
<td>Mudumalai National Park</td>
<td>Tamil Nadu</td>
<td>1990</td>
<td>103</td>
</tr>
<tr>
<td>Mukurthi National Park</td>
<td>Tamil Nadu</td>
<td>1990</td>
<td>78</td>
</tr>
<tr>
<td>Murlen National Park</td>
<td>Mizoram</td>
<td>1991</td>
<td>200</td>
</tr>
<tr>
<td>Buxa Tiger Reserve</td>
<td>West Bengal</td>
<td>1992</td>
<td>117</td>
</tr>
<tr>
<td>Campbell Bay National Park</td>
<td>Andaman &amp; Nicobar</td>
<td>1992</td>
<td>426</td>
</tr>
<tr>
<td>Galathea National Park</td>
<td>Andaman &amp; Nicobar</td>
<td>1992</td>
<td>110</td>
</tr>
<tr>
<td>Singallia National Park</td>
<td>West Bengal</td>
<td>1992</td>
<td>78</td>
</tr>
<tr>
<td>Intanki National Park</td>
<td>Nagaland</td>
<td>1993</td>
<td>202</td>
</tr>
<tr>
<td>Gorumara National Park</td>
<td>West Bengal</td>
<td>1994</td>
<td>79</td>
</tr>
<tr>
<td>Kasu Brahmananda Reddy National Park</td>
<td>Andhra Pradesh</td>
<td>1994</td>
<td>1.42</td>
</tr>
<tr>
<td>Mahavir Harina Vanasthali National Park</td>
<td>Andhra Pradesh</td>
<td>1994</td>
<td>14</td>
</tr>
<tr>
<td>Mrugavani National Park</td>
<td>Andhra Pradesh</td>
<td>1994</td>
<td>3</td>
</tr>
<tr>
<td>Rani Jhansi Marine National Park</td>
<td>Andaman &amp; Nicobar</td>
<td>1996</td>
<td>256</td>
</tr>
<tr>
<td>Phawngpui Blue Mountain National Park</td>
<td>Mizoram</td>
<td>1997</td>
<td>50</td>
</tr>
<tr>
<td>Nameri National Park</td>
<td>Assam</td>
<td>1998</td>
<td>200</td>
</tr>
<tr>
<td>Dibru-Saikhowa National Park</td>
<td>Assam</td>
<td>1999</td>
<td>340</td>
</tr>
<tr>
<td>Orang National Park</td>
<td>Assam</td>
<td>1999</td>
<td>78</td>
</tr>
<tr>
<td>Kalesar National Park</td>
<td>Haryana</td>
<td>2003</td>
<td>100</td>
</tr>
<tr>
<td>Mathikettan Shola National Park</td>
<td>Kerala</td>
<td>2003</td>
<td>12</td>
</tr>
<tr>
<td>Chandoli National Park</td>
<td>Maharashtra</td>
<td>2004</td>
<td>317</td>
</tr>
<tr>
<td>Darrah National Park</td>
<td>Rajasthan</td>
<td>2004</td>
<td>250</td>
</tr>
<tr>
<td>Vikramshila Gangetic Dolphin Sanctuary</td>
<td>Bihar</td>
<td>2009</td>
<td>250</td>
</tr>
<tr>
<td>Hazaribag National Park</td>
<td>Jharkhand</td>
<td>N/A</td>
<td>183</td>
</tr>
<tr>
<td>Palani Hills National Park</td>
<td>Tamil Nadu</td>
<td>Proposed</td>
<td>736</td>
</tr>
</tbody>
</table>

**WILDLIFE SANCTUARIES OF INDIA**
<table>
<thead>
<tr>
<th>Village/Location</th>
<th>State</th>
<th>Year</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mountabu</td>
<td>Rajasthan</td>
<td>1960</td>
<td>288.84</td>
</tr>
<tr>
<td>Sechu Tuan Nala</td>
<td>Himachal Pradesh</td>
<td>1962</td>
<td>655.32</td>
</tr>
<tr>
<td>Tundah</td>
<td>Himachal Pradesh</td>
<td>1962</td>
<td>419.48</td>
</tr>
<tr>
<td>Kugti</td>
<td>Himachal Pradesh</td>
<td>1962</td>
<td>330</td>
</tr>
<tr>
<td>Nargu</td>
<td>Himachal Pradesh</td>
<td>1962</td>
<td>243.13</td>
</tr>
<tr>
<td>Bandli</td>
<td>Himachal Pradesh</td>
<td>1962</td>
<td>239.47</td>
</tr>
<tr>
<td>Gobind Sagar &amp; Naina Devi</td>
<td>Himachal Pradesh</td>
<td>1962</td>
<td>120.67</td>
</tr>
<tr>
<td>Darlaghat</td>
<td>Himachal Pradesh</td>
<td>1962</td>
<td>98.71</td>
</tr>
<tr>
<td>Shikari Devi</td>
<td>Himachal Pradesh</td>
<td>1962</td>
<td>71.19</td>
</tr>
<tr>
<td>Raksham Chitkul</td>
<td>Himachal Pradesh</td>
<td>1962</td>
<td>38.27</td>
</tr>
<tr>
<td>Naina Devi</td>
<td>Himachal Pradesh</td>
<td>1962</td>
<td>37.19</td>
</tr>
<tr>
<td>Talra</td>
<td>Himachal Pradesh</td>
<td>1962</td>
<td>36.16</td>
</tr>
<tr>
<td>Majathal</td>
<td>Himachal Pradesh</td>
<td>1962</td>
<td>31.64</td>
</tr>
<tr>
<td>Lippa Asrang</td>
<td>Himachal Pradesh</td>
<td>1962</td>
<td>29.53</td>
</tr>
<tr>
<td>Daranghati</td>
<td>Himachal Pradesh</td>
<td>1962</td>
<td>27.01</td>
</tr>
<tr>
<td>Kolleru</td>
<td>Andhra Pradesh</td>
<td>1963</td>
<td>673</td>
</tr>
<tr>
<td>Gir</td>
<td>Gujarat</td>
<td>1965</td>
<td>1153.42</td>
</tr>
<tr>
<td>Kaval</td>
<td>Andhra Pradesh</td>
<td>1965</td>
<td>893</td>
</tr>
<tr>
<td>Bhagwan Mahavir</td>
<td>Goa</td>
<td>1967</td>
<td>148.52</td>
</tr>
<tr>
<td>Bhagwan Mahavir</td>
<td>Goa</td>
<td>1968</td>
<td>105</td>
</tr>
<tr>
<td>Yawal</td>
<td>Maharashtra</td>
<td>1969</td>
<td>177.52</td>
</tr>
<tr>
<td>Nal Sarovar</td>
<td>Gujarat</td>
<td>1969</td>
<td>120.82</td>
</tr>
<tr>
<td>Nagzira</td>
<td>Maharashtra</td>
<td>1970</td>
<td>152.81</td>
</tr>
<tr>
<td>Bor</td>
<td>Maharashtra</td>
<td>1970</td>
<td>61.1</td>
</tr>
<tr>
<td>Tansa</td>
<td>Maharashtra</td>
<td>1970</td>
<td>30.41</td>
</tr>
<tr>
<td>Kumbhalgarh</td>
<td>Rajasthan</td>
<td>1971</td>
<td>578.26</td>
</tr>
<tr>
<td>Nelapattu</td>
<td>Andhra Pradesh</td>
<td>1972</td>
<td>404</td>
</tr>
<tr>
<td>Kedarnath Wild Life Sanctuary</td>
<td>Uttar Pradesh</td>
<td>1972</td>
<td>975.24</td>
</tr>
<tr>
<td>Gomardah</td>
<td>Madhya Pradesh</td>
<td>1972</td>
<td>277.82</td>
</tr>
<tr>
<td>Kishanpur</td>
<td>Uttar Pradesh</td>
<td>1972</td>
<td>227.12</td>
</tr>
<tr>
<td>Bondla Wildlife</td>
<td>Goa</td>
<td>1972</td>
<td>8</td>
</tr>
<tr>
<td>Wild Ass</td>
<td>Gujarat</td>
<td>1973</td>
<td>4953.7</td>
</tr>
<tr>
<td>Waynad</td>
<td>Kerala</td>
<td>1973</td>
<td>344.44</td>
</tr>
<tr>
<td>Parambikulam</td>
<td>Kerala</td>
<td>1973</td>
<td>285</td>
</tr>
<tr>
<td>Sitanadi</td>
<td>Madhya Pradesh</td>
<td>1974</td>
<td>553.36</td>
</tr>
<tr>
<td>Bhadra</td>
<td>Karnataka</td>
<td>1974</td>
<td>492.46</td>
</tr>
<tr>
<td>Sharaavathi Valley</td>
<td>Karnataka</td>
<td>1974</td>
<td>413.23</td>
</tr>
<tr>
<td>Shettihally</td>
<td>Karnataka</td>
<td>1974</td>
<td>395.6</td>
</tr>
<tr>
<td>Gandhi Sagar</td>
<td>Madhya Pradesh</td>
<td>1974</td>
<td>368.62</td>
</tr>
<tr>
<td>Mukambika</td>
<td>Karnataka</td>
<td>1974</td>
<td>247</td>
</tr>
<tr>
<td>Bramhagiri</td>
<td>Karnataka</td>
<td>1974</td>
<td>181.29</td>
</tr>
<tr>
<td>Ranebennur</td>
<td>Karnataka</td>
<td>1974</td>
<td>119</td>
</tr>
<tr>
<td>Someswarra</td>
<td>Karnataka</td>
<td>1974</td>
<td>88.4</td>
</tr>
<tr>
<td>Narsingarh</td>
<td>Madhya Pradesh</td>
<td>1974</td>
<td>57.19</td>
</tr>
<tr>
<td>Melkote Temple</td>
<td>Karnataka</td>
<td>1974</td>
<td>49.82</td>
</tr>
<tr>
<td>Nugu</td>
<td>Karnataka</td>
<td>1974</td>
<td>30.32</td>
</tr>
<tr>
<td>Ghataprabha</td>
<td>Karnataka</td>
<td>1974</td>
<td>29.78</td>
</tr>
<tr>
<td>Noradehi</td>
<td>Madhya Pradesh</td>
<td>1975</td>
<td>1034.52</td>
</tr>
<tr>
<td>Achanakmar</td>
<td>Madhya Pradesh</td>
<td>1975</td>
<td>551.55</td>
</tr>
<tr>
<td>Sanjay (Dubri)</td>
<td>Madhya Pradesh</td>
<td>1975</td>
<td>364.69</td>
</tr>
<tr>
<td>Intanki</td>
<td>Nagaland</td>
<td>1975</td>
<td>202.02</td>
</tr>
<tr>
<td>Abohar</td>
<td>Punjab</td>
<td>1975</td>
<td>188.24</td>
</tr>
<tr>
<td>Badankhoh</td>
<td>Madhya Pradesh</td>
<td>1975</td>
<td>104.35</td>
</tr>
<tr>
<td>Bhitarkanika</td>
<td>Orissa</td>
<td>1975</td>
<td>70</td>
</tr>
<tr>
<td>Bir Shikargar</td>
<td>Haryana</td>
<td>1975</td>
<td>10.93</td>
</tr>
<tr>
<td>Satkosia Gorge</td>
<td>Orissa</td>
<td>1976</td>
<td>795.52</td>
</tr>
<tr>
<td>Palamau</td>
<td>Jharkhand</td>
<td>1976</td>
<td>767</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------</td>
<td>------</td>
<td>-----</td>
</tr>
<tr>
<td>Ratapani</td>
<td>Madhya Pradesh</td>
<td>1976</td>
<td>688.79</td>
</tr>
<tr>
<td>Bhimbandh</td>
<td>Bihar</td>
<td>1976</td>
<td>681.9</td>
</tr>
<tr>
<td>Pulicat</td>
<td>Andhra Pradesh</td>
<td>1976</td>
<td>500</td>
</tr>
<tr>
<td>Kateranighat</td>
<td>Uttar Pradesh</td>
<td>1976</td>
<td>400.09</td>
</tr>
<tr>
<td>Singhalia</td>
<td>West Bengal</td>
<td>1976</td>
<td>362.4</td>
</tr>
<tr>
<td>Singhor (Sindhari)</td>
<td>Madhya Pradesh</td>
<td>1976</td>
<td>287.91</td>
</tr>
<tr>
<td>Gautam Buddha</td>
<td>Bihar</td>
<td>1976</td>
<td>259.48</td>
</tr>
<tr>
<td>Barnawapra</td>
<td>Madhya Pradesh</td>
<td>1976</td>
<td>244.66</td>
</tr>
<tr>
<td>Dalma</td>
<td>Jharkhand</td>
<td>1976</td>
<td>193.22</td>
</tr>
<tr>
<td>Hazarbagh</td>
<td>Jharkhand</td>
<td>1976</td>
<td>186.25</td>
</tr>
<tr>
<td>Murti Wildlife</td>
<td>West Bengal</td>
<td>1976</td>
<td>127.22</td>
</tr>
<tr>
<td>Chail</td>
<td>Himachal Pradesh</td>
<td>1976</td>
<td>110.04</td>
</tr>
<tr>
<td>Idukki</td>
<td>Kerala</td>
<td>1976</td>
<td>77</td>
</tr>
<tr>
<td>Tirthan</td>
<td>Himachal Pradesh</td>
<td>1976</td>
<td>68.25</td>
</tr>
<tr>
<td>Mahuadaur</td>
<td>Bihar</td>
<td>1976</td>
<td>63.25</td>
</tr>
<tr>
<td>Senchal</td>
<td>West Bengal</td>
<td>1976</td>
<td>38.88</td>
</tr>
<tr>
<td>Lothian Island</td>
<td>West Bengal</td>
<td>1976</td>
<td>38</td>
</tr>
<tr>
<td>Halliday Island</td>
<td>West Bengal</td>
<td>1976</td>
<td>5.95</td>
</tr>
<tr>
<td>Pakhui</td>
<td>Arunachal Pradesh</td>
<td>1977</td>
<td>861.95</td>
</tr>
<tr>
<td>Kinnerasani</td>
<td>Andhra Pradesh</td>
<td>1977</td>
<td>655.41</td>
</tr>
<tr>
<td>Bori</td>
<td>Madhya Pradesh</td>
<td>1977</td>
<td>518.25</td>
</tr>
<tr>
<td>Pachmarhi</td>
<td>Madhya Pradesh</td>
<td>1977</td>
<td>461.85</td>
</tr>
<tr>
<td>Ranipur</td>
<td>Uttar Pradesh</td>
<td>1977</td>
<td>230.31</td>
</tr>
<tr>
<td>Barren Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1977</td>
<td>8.1</td>
</tr>
<tr>
<td>Narcondum Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1977</td>
<td>6.81</td>
</tr>
<tr>
<td>North Reef Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1977</td>
<td>3.48</td>
</tr>
<tr>
<td>South Sentinel Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1977</td>
<td>1.61</td>
</tr>
<tr>
<td>Nagarjunasagar Srisailam</td>
<td>Andhra Pradesh</td>
<td>1978</td>
<td>3568</td>
</tr>
<tr>
<td>Kaimur</td>
<td>Bihar</td>
<td>1978</td>
<td>1342.22</td>
</tr>
<tr>
<td>Tamor Pingla</td>
<td>Madhya Pradesh</td>
<td>1978</td>
<td>608.52</td>
</tr>
<tr>
<td>Papikonda</td>
<td>Andhra Pradesh</td>
<td>1978</td>
<td>590.68</td>
</tr>
<tr>
<td>Bagdogra</td>
<td>Madhya Pradesh</td>
<td>1978</td>
<td>478.9</td>
</tr>
<tr>
<td>Valmikinagar</td>
<td>Bihar</td>
<td>1978</td>
<td>461.6</td>
</tr>
<tr>
<td>Samarsot</td>
<td>Madhya Pradesh</td>
<td>1978</td>
<td>340.35</td>
</tr>
<tr>
<td>National Chambal</td>
<td>Madhya Pradesh</td>
<td>1978</td>
<td>320</td>
</tr>
<tr>
<td>Coringa</td>
<td>Andhra Pradesh</td>
<td>1978</td>
<td>235.79</td>
</tr>
<tr>
<td>Lawalang</td>
<td>Bihar</td>
<td>1978</td>
<td>211.03</td>
</tr>
<tr>
<td>Hadgarh</td>
<td>Orissa</td>
<td>1978</td>
<td>191.06</td>
</tr>
<tr>
<td>D’ering Memorial</td>
<td>Arunachal Pradesh</td>
<td>1978</td>
<td>190</td>
</tr>
<tr>
<td>Jessore</td>
<td>Gujarat</td>
<td>1978</td>
<td>180.66</td>
</tr>
<tr>
<td>Itanagar</td>
<td>Arunachal Pradesh</td>
<td>1978</td>
<td>140.3</td>
</tr>
<tr>
<td>Siwaram</td>
<td>Andhra Pradesh</td>
<td>1978</td>
<td>36.29</td>
</tr>
<tr>
<td>Rajgir</td>
<td>Bihar</td>
<td>1978</td>
<td>35.84</td>
</tr>
<tr>
<td>Manjira</td>
<td>Andhra Pradesh</td>
<td>1978</td>
<td>20</td>
</tr>
<tr>
<td>Great Indian Bustard</td>
<td>Maharashtra</td>
<td>1979</td>
<td>8496.44</td>
</tr>
<tr>
<td>Simlipal</td>
<td>Orissa</td>
<td>1979</td>
<td>845.7</td>
</tr>
<tr>
<td>National Chambal</td>
<td>Uttar Pradesh</td>
<td>1979</td>
<td>635</td>
</tr>
<tr>
<td>Sita Mata</td>
<td>Rajasthan</td>
<td>1979</td>
<td>422.94</td>
</tr>
<tr>
<td>Bada</td>
<td>Gujarat</td>
<td>1979</td>
<td>192.31</td>
</tr>
<tr>
<td>Lakhowa</td>
<td>Assam</td>
<td>1979</td>
<td>70.14</td>
</tr>
<tr>
<td>Dr Salim Ali Bird Sanctuary</td>
<td>Goa</td>
<td>1979</td>
<td>1.8</td>
</tr>
<tr>
<td>Marine (Gulf of Kutch)</td>
<td>Gujarat</td>
<td>1980</td>
<td>293.03</td>
</tr>
<tr>
<td>Mehao</td>
<td>Arunachal Pradesh</td>
<td>1980</td>
<td>281.5</td>
</tr>
<tr>
<td>Pranahita</td>
<td>Andhra Pradesh</td>
<td>1980</td>
<td>136.02</td>
</tr>
<tr>
<td>Jawahar Sagar</td>
<td>Rajasthan</td>
<td>1980</td>
<td>100</td>
</tr>
<tr>
<td>Location</td>
<td>State</td>
<td>Year</td>
<td>Area (ha)</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>------------------</td>
<td>------</td>
<td>-----------</td>
</tr>
<tr>
<td>Nahargarh</td>
<td>Rajasthan</td>
<td>1980</td>
<td>50</td>
</tr>
<tr>
<td>Barnadi</td>
<td>Assam</td>
<td>1980</td>
<td>26.22</td>
</tr>
<tr>
<td>Narayan Sarovar (Chinkara)</td>
<td>Gujarat</td>
<td>1981</td>
<td>765.79</td>
</tr>
<tr>
<td>Ghatigaon</td>
<td>Madhya Pradesh</td>
<td>1981</td>
<td>512</td>
</tr>
<tr>
<td>Kotgarh</td>
<td>Orissa</td>
<td>1981</td>
<td>399.05</td>
</tr>
<tr>
<td>Palpur - Kuno Wildlife Sanctuary</td>
<td>Madhya Pradesh</td>
<td>1981</td>
<td>344.68</td>
</tr>
<tr>
<td>Karera</td>
<td>Madhya Pradesh</td>
<td>1981</td>
<td>202.21</td>
</tr>
<tr>
<td>Baisipalli</td>
<td>Orissa</td>
<td>1981</td>
<td>168.35</td>
</tr>
<tr>
<td>Ken Gharial</td>
<td>Madhya Pradesh</td>
<td>1981</td>
<td>45</td>
</tr>
<tr>
<td>Sone Gharial</td>
<td>Madhya Pradesh</td>
<td>1981</td>
<td>41.8</td>
</tr>
<tr>
<td>Surinsar-Mansar</td>
<td>Jammu &amp; Kashmir</td>
<td>1981</td>
<td>39.58</td>
</tr>
<tr>
<td>Nandini</td>
<td>Jammu &amp; Kashmir</td>
<td>1981</td>
<td>33.72</td>
</tr>
<tr>
<td>Nongkhyillem</td>
<td>Meghalaya</td>
<td>1981</td>
<td>29</td>
</tr>
<tr>
<td>Ramnagar</td>
<td>Jammu &amp; Kashmir</td>
<td>1981</td>
<td>12.9</td>
</tr>
<tr>
<td>Schoolpaneshwar</td>
<td>Gujarat</td>
<td>1982</td>
<td>607.7</td>
</tr>
<tr>
<td>Kaimoor</td>
<td>Uttar Pradesh</td>
<td>1982</td>
<td>500.75</td>
</tr>
<tr>
<td>Rupi Bhabha</td>
<td>Himachal Pradesh</td>
<td>1982</td>
<td>354.14</td>
</tr>
<tr>
<td>Ramgarh Bundi</td>
<td>Rajasthan</td>
<td>1982</td>
<td>307</td>
</tr>
<tr>
<td>Jamwa Ramgarh</td>
<td>Rajasthan</td>
<td>1982</td>
<td>300</td>
</tr>
<tr>
<td>Chandaka Dampara</td>
<td>Orissa</td>
<td>1982</td>
<td>175.79</td>
</tr>
<tr>
<td>Khalsuni</td>
<td>Orissa</td>
<td>1982</td>
<td>116</td>
</tr>
<tr>
<td>Ratanmahal</td>
<td>Gujarat</td>
<td>1982</td>
<td>55.65</td>
</tr>
<tr>
<td>Harike Lake</td>
<td>Punjab</td>
<td>1982</td>
<td>43</td>
</tr>
<tr>
<td>Keladevi</td>
<td>Rajasthan</td>
<td>1983</td>
<td>676</td>
</tr>
<tr>
<td>Phulwari</td>
<td>Rajasthan</td>
<td>1983</td>
<td>511.41</td>
</tr>
<tr>
<td>Todgarh Raoli</td>
<td>Rajasthan</td>
<td>1983</td>
<td>495.27</td>
</tr>
<tr>
<td>Sardarpur Florican</td>
<td>Madhya Pradesh</td>
<td>1983</td>
<td>348.12</td>
</tr>
<tr>
<td>Pong Dam Sanctuary</td>
<td>Himachal Pradesh</td>
<td>1983</td>
<td>322.7</td>
</tr>
<tr>
<td>National Chambal</td>
<td>Rajasthan</td>
<td>1983</td>
<td>280</td>
</tr>
<tr>
<td>Pamed Wild Buffalo</td>
<td>Madhya Pradesh</td>
<td>1983</td>
<td>262</td>
</tr>
<tr>
<td>Udanti Wild Buffalo</td>
<td>Madhya Pradesh</td>
<td>1983</td>
<td>247.59</td>
</tr>
<tr>
<td>Panpatha</td>
<td>Madhya Pradesh</td>
<td>1983</td>
<td>245.84</td>
</tr>
<tr>
<td>Bhensrodgargh</td>
<td>Rajasthan</td>
<td>1983</td>
<td>229.14</td>
</tr>
<tr>
<td>Bhairamgarh</td>
<td>Madhya Pradesh</td>
<td>1983</td>
<td>138.95</td>
</tr>
<tr>
<td>Fensatellite</td>
<td>Madhya Pradesh</td>
<td>1983</td>
<td>110.24</td>
</tr>
<tr>
<td>Shergarh</td>
<td>Rajasthan</td>
<td>1983</td>
<td>98.71</td>
</tr>
<tr>
<td>Peppara</td>
<td>Kerala</td>
<td>1983</td>
<td>53</td>
</tr>
<tr>
<td>Thattekkad Bird</td>
<td>Kerala</td>
<td>1983</td>
<td>25</td>
</tr>
<tr>
<td>Crocodile (Lohabrack)</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1983</td>
<td>22.21</td>
</tr>
<tr>
<td>Sailana Florican</td>
<td>Madhya Pradesh</td>
<td>1983</td>
<td>12.96</td>
</tr>
<tr>
<td>Kuldiha</td>
<td>Orissa</td>
<td>1984</td>
<td>272.75</td>
</tr>
<tr>
<td>Chimony</td>
<td>Kerala</td>
<td>1984</td>
<td>105</td>
</tr>
<tr>
<td>Sawai Mansingh</td>
<td>Rajasthan</td>
<td>1984</td>
<td>103.25</td>
</tr>
<tr>
<td>Shenduruny</td>
<td>Kerala</td>
<td>1984</td>
<td>100.32</td>
</tr>
<tr>
<td>Chinnar</td>
<td>Kerala</td>
<td>1984</td>
<td>90.44</td>
</tr>
<tr>
<td>Balukhand Konark</td>
<td>Orissa</td>
<td>1984</td>
<td>71.72</td>
</tr>
<tr>
<td>Aralam</td>
<td>Kerala</td>
<td>1984</td>
<td>55</td>
</tr>
<tr>
<td>Barshey Rhododendron Sanctuary</td>
<td>Sikkim</td>
<td>1984</td>
<td>51.76</td>
</tr>
<tr>
<td>Fambong Lho</td>
<td>Sikkim</td>
<td>1984</td>
<td>51.76</td>
</tr>
<tr>
<td>Parasnath</td>
<td>Bihar</td>
<td>1984</td>
<td>49.23</td>
</tr>
<tr>
<td>Shingba Rhododendron</td>
<td>Sikkim</td>
<td>1984</td>
<td>32.5</td>
</tr>
<tr>
<td>Melghat</td>
<td>Maharashtra</td>
<td>1985</td>
<td>597.23</td>
</tr>
<tr>
<td>Dampa</td>
<td>Mizoram</td>
<td>1985</td>
<td>500</td>
</tr>
<tr>
<td>Koyna</td>
<td>Maharashtra</td>
<td>1985</td>
<td>423.55</td>
</tr>
<tr>
<td>Debrigarh</td>
<td>Orissa</td>
<td>1985</td>
<td>346.91</td>
</tr>
<tr>
<td>Chandoli</td>
<td>Maharashtra</td>
<td>1985</td>
<td>308.97</td>
</tr>
</tbody>
</table>

231
<table>
<thead>
<tr>
<th>Name</th>
<th>State</th>
<th>Year</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nakti Dam</td>
<td>Bihar</td>
<td>1985</td>
<td>206.4</td>
</tr>
<tr>
<td>Baretha</td>
<td>Rajasthan</td>
<td>1985</td>
<td>192.76</td>
</tr>
<tr>
<td>Lakhari Valley</td>
<td>Orissa</td>
<td>1985</td>
<td>185.87</td>
</tr>
<tr>
<td>Koderma</td>
<td>Jharkhand</td>
<td>1985</td>
<td>177.95</td>
</tr>
<tr>
<td>Nameri</td>
<td>Assam</td>
<td>1985</td>
<td>137.07</td>
</tr>
<tr>
<td>Interview Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1985</td>
<td>133</td>
</tr>
<tr>
<td>Bhimashankar</td>
<td>Maharashtra</td>
<td>1985</td>
<td>130.78</td>
</tr>
<tr>
<td>Orang</td>
<td>Assam</td>
<td>1985</td>
<td>72.6</td>
</tr>
<tr>
<td>Churdhar</td>
<td>Himachal Pradesh</td>
<td>1985</td>
<td>56.59</td>
</tr>
<tr>
<td>Arabithittu</td>
<td>Karnataka</td>
<td>1985</td>
<td>13.5</td>
</tr>
<tr>
<td>Sagershwar</td>
<td>Maharashtra</td>
<td>1985</td>
<td>10.87</td>
</tr>
<tr>
<td>Tilanchang Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1985</td>
<td>6.83</td>
</tr>
<tr>
<td>Battimalve Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1985</td>
<td>2.23</td>
</tr>
<tr>
<td>Kutch Desert</td>
<td>Gujarat</td>
<td>1986</td>
<td>7506.22</td>
</tr>
<tr>
<td>Askot</td>
<td>Uttarakhand</td>
<td>1986</td>
<td>599.93</td>
</tr>
<tr>
<td>Andhari</td>
<td>Maharashtra</td>
<td>1986</td>
<td>509.27</td>
</tr>
<tr>
<td>Kalsubai Harishchandra</td>
<td>Maharashtra</td>
<td>1986</td>
<td>361.71</td>
</tr>
<tr>
<td>Jaikwadi</td>
<td>Maharashtra</td>
<td>1986</td>
<td>341.05</td>
</tr>
<tr>
<td>Painganga</td>
<td>Maharashtra</td>
<td>1986</td>
<td>324.62</td>
</tr>
<tr>
<td>Gautala Autramghat</td>
<td>Maharashtra</td>
<td>1986</td>
<td>260.61</td>
</tr>
<tr>
<td>Buxa</td>
<td>West Bengal</td>
<td>1986</td>
<td>251.89</td>
</tr>
<tr>
<td>Kabar</td>
<td>Bihar</td>
<td>1986</td>
<td>204</td>
</tr>
<tr>
<td>Chaprala</td>
<td>Maharashtra</td>
<td>1986</td>
<td>134.78</td>
</tr>
<tr>
<td>Nandpur Madmeshwar</td>
<td>Maharashtra</td>
<td>1986</td>
<td>100.12</td>
</tr>
<tr>
<td>Aner Dam</td>
<td>Maharashtra</td>
<td>1986</td>
<td>82.94</td>
</tr>
<tr>
<td>Phansad</td>
<td>Maharashtra</td>
<td>1986</td>
<td>69.79</td>
</tr>
<tr>
<td>Hastinapur</td>
<td>Uttar Pradesh</td>
<td>1986</td>
<td>20.73</td>
</tr>
<tr>
<td>Changthang</td>
<td>Jammu &amp; Kashmir</td>
<td>1987</td>
<td>4000</td>
</tr>
<tr>
<td>Lachipora</td>
<td>Jammu &amp; Kashmir</td>
<td>1987</td>
<td>800</td>
</tr>
<tr>
<td>Biligiri Rangswamy Temple</td>
<td>Karnataka</td>
<td>1987</td>
<td>539.52</td>
</tr>
<tr>
<td>Cauvery</td>
<td>Karnataka</td>
<td>1987</td>
<td>510.51</td>
</tr>
<tr>
<td>Sohagabarwa</td>
<td>Uttar Pradesh</td>
<td>1987</td>
<td>428.2</td>
</tr>
<tr>
<td>Overa-Aru</td>
<td>Jammu &amp; Kashmir</td>
<td>1987</td>
<td>425</td>
</tr>
<tr>
<td>Sonanandi</td>
<td>Uttar Pradesh</td>
<td>1987</td>
<td>301.18</td>
</tr>
<tr>
<td>Spike Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>211.7</td>
</tr>
<tr>
<td>Gulmarg</td>
<td>Jammu &amp; Kashmir</td>
<td>1987</td>
<td>186</td>
</tr>
<tr>
<td>Trishna</td>
<td>Tripura</td>
<td>1987</td>
<td>170.56</td>
</tr>
<tr>
<td>Chautala</td>
<td>Haryana</td>
<td>1987</td>
<td>113.96</td>
</tr>
<tr>
<td>Hirpora</td>
<td>Jammu &amp; Kashmir</td>
<td>1987</td>
<td>110</td>
</tr>
<tr>
<td>Talakaveri Wildlife Sanctuary</td>
<td>Karnataka</td>
<td>1987</td>
<td>105</td>
</tr>
<tr>
<td>Pushpagiri Wildlife Sanctuary</td>
<td>Karnataka</td>
<td>1987</td>
<td>102.59</td>
</tr>
<tr>
<td>Pobitora Wildlife Sanctuary</td>
<td>Assam</td>
<td>1987</td>
<td>38.83</td>
</tr>
<tr>
<td>Maenam</td>
<td>Sikkim</td>
<td>1987</td>
<td>35.34</td>
</tr>
<tr>
<td>Overa</td>
<td>Jammu &amp; Kashmir</td>
<td>1987</td>
<td>32.37</td>
</tr>
<tr>
<td>Landfall Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>29.48</td>
</tr>
<tr>
<td>Malvan Marine</td>
<td>Maharashtra</td>
<td>1987</td>
<td>29.12</td>
</tr>
<tr>
<td>Limber</td>
<td>Jammu &amp; Kashmir</td>
<td>1987</td>
<td>26</td>
</tr>
<tr>
<td>Sepahijala</td>
<td>Tripura</td>
<td>1987</td>
<td>18.53</td>
</tr>
<tr>
<td>Chilika Lake (Nalaban)</td>
<td>Orissa</td>
<td>1987</td>
<td>15.53</td>
</tr>
<tr>
<td>Defence Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>10.49</td>
</tr>
<tr>
<td>Cinque Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>9.51</td>
</tr>
<tr>
<td>Flat Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>9.36</td>
</tr>
<tr>
<td>Buchaan Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>9.33</td>
</tr>
<tr>
<td>Kyd Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>8</td>
</tr>
<tr>
<td>Shearman Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>7.85</td>
</tr>
<tr>
<td>Paget Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>7.36</td>
</tr>
<tr>
<td>West Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>6.4</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------</td>
<td>------</td>
<td>-----</td>
</tr>
<tr>
<td>East Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>6.11</td>
</tr>
<tr>
<td>Ranger Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>4.26</td>
</tr>
<tr>
<td>Swamp Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>4.09</td>
</tr>
<tr>
<td>East (Ingis) Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>3.55</td>
</tr>
<tr>
<td>Benett Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>3.46</td>
</tr>
<tr>
<td>Talabaicha Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>3.21</td>
</tr>
<tr>
<td>Point Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>3.07</td>
</tr>
<tr>
<td>Baltal</td>
<td>Jammu &amp; Kashmir</td>
<td>1987</td>
<td>3</td>
</tr>
<tr>
<td>Bondoville Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>2.55</td>
</tr>
<tr>
<td>Table (Delgarno) Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>2.29</td>
</tr>
<tr>
<td>James Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>2.1</td>
</tr>
<tr>
<td>Reef Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>1.74</td>
</tr>
<tr>
<td>Table (Excelsior) Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>1.69</td>
</tr>
<tr>
<td>Sandy Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>1.58</td>
</tr>
<tr>
<td>Roper Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>1.46</td>
</tr>
<tr>
<td>Pitman Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>1.37</td>
</tr>
<tr>
<td>South Brother Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>1.24</td>
</tr>
<tr>
<td>South Reef Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>1.17</td>
</tr>
<tr>
<td>Bluff Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>1.14</td>
</tr>
<tr>
<td>Sir Huge Rose Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>1.06</td>
</tr>
<tr>
<td>Temple Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>1.04</td>
</tr>
<tr>
<td>Ross Island</td>
<td>Andaman &amp; Nicobar Islands</td>
<td>1987</td>
<td>1.01</td>
</tr>
<tr>
<td>Sunabema</td>
<td>Orissa</td>
<td>1988</td>
<td>600</td>
</tr>
<tr>
<td>Gumti</td>
<td>Tripura</td>
<td>1988</td>
<td>389.54</td>
</tr>
<tr>
<td>Badrama</td>
<td>Orissa</td>
<td>1988</td>
<td>304.03</td>
</tr>
<tr>
<td>Kanji</td>
<td>Jammu &amp; Kashmir</td>
<td>1988</td>
<td>250</td>
</tr>
<tr>
<td>Katepurna</td>
<td>Maharashtra</td>
<td>1988</td>
<td>73.69</td>
</tr>
<tr>
<td>Binsar</td>
<td>Uttarakhand</td>
<td>1988</td>
<td>45.59</td>
</tr>
<tr>
<td>Rampura</td>
<td>Gujarat</td>
<td>1988</td>
<td>15.01</td>
</tr>
<tr>
<td>Kamlang</td>
<td>Arunachal Pradesh</td>
<td>1989</td>
<td>783</td>
</tr>
<tr>
<td>Balaram-Ambaji</td>
<td>Gujarat</td>
<td>1989</td>
<td>542.08</td>
</tr>
<tr>
<td>Eagnest</td>
<td>Arunachal Pradesh</td>
<td>1989</td>
<td>217</td>
</tr>
<tr>
<td>Yagoupokpi Lokchao</td>
<td>Manipur</td>
<td>1989</td>
<td>184.8</td>
</tr>
<tr>
<td>Sessa Orchid</td>
<td>Arunachal Pradesh</td>
<td>1989</td>
<td>100</td>
</tr>
<tr>
<td>Dipor Beel</td>
<td>Assam</td>
<td>1989</td>
<td>40</td>
</tr>
<tr>
<td>Paniya</td>
<td>Gujarat</td>
<td>1989</td>
<td>39.63</td>
</tr>
<tr>
<td>Jal dapara</td>
<td>West Bengal</td>
<td>1990</td>
<td>216.51</td>
</tr>
<tr>
<td>Purna</td>
<td>Gujarat</td>
<td>1990</td>
<td>160.84</td>
</tr>
<tr>
<td>Jambughoda</td>
<td>Gujarat</td>
<td>1990</td>
<td>130.38</td>
</tr>
<tr>
<td>Dibang Valley</td>
<td>Arunachal Pradesh</td>
<td>1991</td>
<td>4149</td>
</tr>
<tr>
<td>Ngengpui</td>
<td>Mizoram</td>
<td>1991</td>
<td>150</td>
</tr>
<tr>
<td>Kane</td>
<td>Arunachal Pradesh</td>
<td>1991</td>
<td>55</td>
</tr>
<tr>
<td>Khamnglung</td>
<td>Mizoram</td>
<td>1991</td>
<td>41</td>
</tr>
<tr>
<td>Karlapat</td>
<td>Orissa</td>
<td>1992</td>
<td>147.66</td>
</tr>
<tr>
<td>Karakoram</td>
<td>Jammu &amp; Kashmir</td>
<td>ND</td>
<td>1800</td>
</tr>
<tr>
<td>Gundlabrahmeswaram</td>
<td>Andhra Pradesh</td>
<td>ND</td>
<td>1194</td>
</tr>
<tr>
<td>Dandeli</td>
<td>Karnataka</td>
<td>ND</td>
<td>834.16</td>
</tr>
<tr>
<td>Rollapadu</td>
<td>Andhra Pradesh</td>
<td>ND</td>
<td>614</td>
</tr>
<tr>
<td>Mundanthurai</td>
<td>Tamil Nadu</td>
<td>ND</td>
<td>567.38</td>
</tr>
<tr>
<td>Sivenkateshwara</td>
<td>Andhra Pradesh</td>
<td>ND</td>
<td>506.94</td>
</tr>
<tr>
<td>Sivilliputhur</td>
<td>Tamil Nadu</td>
<td>ND</td>
<td>485.2</td>
</tr>
<tr>
<td>Srilanka Malleswara</td>
<td>Andhra Pradesh</td>
<td>ND</td>
<td>464.42</td>
</tr>
<tr>
<td>Pulicat</td>
<td>Tamil Nadu</td>
<td>ND</td>
<td>461.02</td>
</tr>
<tr>
<td>Kaundinya</td>
<td>Andhra Pradesh</td>
<td>ND</td>
<td>357</td>
</tr>
<tr>
<td>Kuno - Palpur</td>
<td>Madhya Pradesh</td>
<td>ND</td>
<td>345</td>
</tr>
<tr>
<td>Place</td>
<td>State</td>
<td>Type</td>
<td>Population</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------------</td>
<td>------</td>
<td>------------</td>
</tr>
<tr>
<td>Mudumalai</td>
<td>Tamil Nadu</td>
<td>ND</td>
<td>321.55</td>
</tr>
<tr>
<td>Kalakkadu</td>
<td>Tamil Nadu</td>
<td>ND</td>
<td>223.58</td>
</tr>
<tr>
<td>Krishna</td>
<td>Andhra Pradesh</td>
<td>ND</td>
<td>194.81</td>
</tr>
<tr>
<td>Sundha Mata</td>
<td>Rajasthan</td>
<td>ND</td>
<td>107</td>
</tr>
<tr>
<td>Mukkurthi</td>
<td>Tamil Nadu</td>
<td>ND</td>
<td>78.46</td>
</tr>
<tr>
<td>Pabha</td>
<td>Assam</td>
<td>ND</td>
<td>49</td>
</tr>
<tr>
<td>Tongri</td>
<td>Jammu &amp; Kashmir</td>
<td>ND</td>
<td>20</td>
</tr>
<tr>
<td>Point Calimere</td>
<td>Tamil Nadu</td>
<td>ND</td>
<td>17.26</td>
</tr>
<tr>
<td>Indira Priyadarshini</td>
<td>Delhi</td>
<td>ND</td>
<td>13.2</td>
</tr>
<tr>
<td>Hokarsar</td>
<td>Jammu &amp; Kashmir</td>
<td>ND</td>
<td>10</td>
</tr>
<tr>
<td>Ranganthittu</td>
<td>Karnataka</td>
<td>ND</td>
<td>0.67</td>
</tr>
<tr>
<td>Bir Motibagh</td>
<td>Punjab</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Bhagmara</td>
<td>Meghalaya</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Tal Chappar</td>
<td>Rajasthan</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Renuka</td>
<td>Himachal Pradesh</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Shilli</td>
<td>Himachal Pradesh</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Bir Bunnerheri</td>
<td>Punjab</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Bassi</td>
<td>Rajasthan</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>National Garhial</td>
<td>Rajasthan</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Khijadiya</td>
<td>Gujarat</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Bir Gurdialpura</td>
<td>Punjab</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Asan Bradge Bird Watching</td>
<td>Uttar Pradesh</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Chilla</td>
<td>Uttar Pradesh</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Mahavir Swamy</td>
<td>Uttar Pradesh</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Nawabganj</td>
<td>Uttar Pradesh</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Samaspur</td>
<td>Uttar Pradesh</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Dhakna Kolkaz</td>
<td>Maharashtra</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Gandhari</td>
<td>Maharashtra</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Wainganga</td>
<td>Maharashtra</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Dhumkhali</td>
<td>Gujarat</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Ushakothi</td>
<td>Orissa</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Chandra Prabha</td>
<td>Bihar</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Topchanchi</td>
<td>Bihar</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Bibhutibhushan</td>
<td>West Bengal</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Bethudahari</td>
<td>West Bengal</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Ballabhpur</td>
<td>West Bengal</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Chapramari</td>
<td>West Bengal</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Gorumara</td>
<td>West Bengal</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Jore Pokhri</td>
<td>West Bengal</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Mahananda</td>
<td>West Bengal</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Parndhan</td>
<td>West Bengal</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Ramnabagan</td>
<td>West Bengal</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Raiganj</td>
<td>West Bengal</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Kyongasia Alpine</td>
<td>Sikkim</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Garampani</td>
<td>Assam</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Siju</td>
<td>Meghalaya</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Pulebatze</td>
<td>Nagaland</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Fakim</td>
<td>Nagaland</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Charilam</td>
<td>Tripura</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Lanjamadugu</td>
<td>Andhra Pradesh</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Karikili</td>
<td>Tamil Nadu</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Vedantangal</td>
<td>Tamil Nadu</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Vettangudi</td>
<td>Tamil Nadu</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Vallanadu</td>
<td>Tamil Nadu</td>
<td>ND</td>
<td>16.41</td>
</tr>
<tr>
<td>Kumarakom</td>
<td>Kerala</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Sukhna</td>
<td>Chandigarh</td>
<td>ND</td>
<td>25.42</td>
</tr>
</tbody>
</table>
# BIOSPHERE RESERVES OF INDIA

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Location</th>
<th>State</th>
<th>Type</th>
<th>Area (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rann of Kachchh/ gyan bharati Reserve</td>
<td>Part of Kutchh, Rajkot and Surendranagar District</td>
<td>Gujarat</td>
<td>Desert</td>
<td>12454</td>
</tr>
<tr>
<td>2</td>
<td>Gulf of Mannar</td>
<td>Indian part of Gulf of Mannar between India and Sri Lanka</td>
<td>Tamil Nadu</td>
<td>Coasts</td>
<td>10500</td>
</tr>
<tr>
<td>3</td>
<td>Sunderbans</td>
<td>Part of delta of Ganges and Brahmaputra river system</td>
<td>West Bengal</td>
<td>Gangetic Delta</td>
<td>9630</td>
</tr>
<tr>
<td>4</td>
<td>Nanda Devi</td>
<td>Parts of Chamoli District, Pithoragarh District &amp; Bageshwar District</td>
<td>Uttarakhand</td>
<td>West Himalayas</td>
<td>5860</td>
</tr>
<tr>
<td>5</td>
<td>Nilgiri Biosphere Reserve</td>
<td>Part of Wynad, Nagarhole, Bandipur and Mudumalai, Nilambur, Silent Valley and Siruvani Hills</td>
<td>Tamil Nadu, Kerala and Karnataka</td>
<td>Western Ghats</td>
<td>5520</td>
</tr>
<tr>
<td>6</td>
<td>Dehong Deband</td>
<td>Part of Siang and Debang valley</td>
<td>Arunachal Pradesh</td>
<td>East Himalayas</td>
<td>5112</td>
</tr>
<tr>
<td>7</td>
<td>Pachmarhi Biosphere Reserve</td>
<td>Parts of Betul District, Hoshangabad District and Chhindwara District</td>
<td>Madhya Pradesh</td>
<td>Semi-Arid</td>
<td>4926</td>
</tr>
<tr>
<td>8</td>
<td>Simlipal</td>
<td>Part of Mayurbhanj district</td>
<td>Orissa</td>
<td>Deccan Peninsula</td>
<td>4374</td>
</tr>
<tr>
<td>9</td>
<td>Aruchanakamar - Amarkantak</td>
<td>Part of Annpur, Dindori and Bilaspur districts</td>
<td>Madhya Pradesh, Chhattisgarh</td>
<td>Maikala Range</td>
<td>3835</td>
</tr>
<tr>
<td>10</td>
<td>Manas</td>
<td>Part of Kokrajhar, Bongaigaon, Barpeta, Nalbari, Kamrup and Darrang District</td>
<td>Assam</td>
<td>East Himalayas</td>
<td>2837</td>
</tr>
<tr>
<td>11</td>
<td>Kanchanjunga</td>
<td>Parts of Kanchanjunga Hills</td>
<td>Sikkim</td>
<td>East Himalayas</td>
<td>2620</td>
</tr>
<tr>
<td>12</td>
<td>Agasthyamalai Biosphere Reserve</td>
<td>Neyyar, Peppara and Shenduruny Wildlife Sanctuary and their adjoining areas</td>
<td>Kerala</td>
<td>Western ghats</td>
<td>1828</td>
</tr>
<tr>
<td>13</td>
<td>Great Nicobar Biosphere Reserve</td>
<td>Southern most islands of Andaman and Nicobar Islands</td>
<td>Andaman and Nicobar Islands</td>
<td>Islands</td>
<td>885</td>
</tr>
<tr>
<td>14</td>
<td>Nokrek</td>
<td>Part of Garo Hills</td>
<td>Meghalaya</td>
<td>East Himalayas</td>
<td>820</td>
</tr>
<tr>
<td>15</td>
<td>Dibru-Saikhowa</td>
<td>Part of Dibrugarh and Tinsukia district</td>
<td>Assam</td>
<td>East Himalayas</td>
<td>765</td>
</tr>
<tr>
<td>16</td>
<td>Cold Desert</td>
<td>Pin Valley National Park and surroundings; Chadratal and Sarchu &amp; Kibber Wildlife Sanctuary</td>
<td>Himachal Pradesh</td>
<td>Western Himalayas</td>
<td>7770</td>
</tr>
</tbody>
</table>