

Distribution and Characteristics of Large-Scale Ecosystems (Biomes)

What Is a Biome?

A **biome** is a very large natural region on Earth.

It has its **own kind of weather, soil, plants, and animals**.

Each biome is different because the **climate and environment** are different in every place.

For example, deserts are hot and dry, while rainforests are warm and wet all year.

A biome is like a “natural home” where living things depend on each other.

The plants and animals living there have special features to survive the local conditions.

Distribution of Biomes Around the World

Biomes are spread across the world depending on **climate and geography**.

The most important factors are **temperature, rainfall, latitude (distance from the equator), and altitude (height above sea level)**.

Near the **equator**, it is hot and rainy, so we find tropical rainforests.

Around **30° north and south**, air is dry, so deserts are common.

In **middle latitudes**, there are grasslands and temperate forests.

Near the **poles**, it is cold and frozen, forming tundra and polar regions.

Thus, the **distribution of biomes follows global climate patterns**.

Tropical Rainforest Biome

Tropical rainforests are found near the **equator** — for example, in the Amazon, Congo, and Southeast Asia.

They get **heavy rain all year** and have **high temperature and high humidity**.

The trees are very **tall, dense, and evergreen**, forming several layers.

The forest floor gets little sunlight because of thick leaves above.

Animals like **monkeys, snakes, parrots, frogs, and insects** live here.

The soil is not very rich because heavy rain washes away nutrients.

Tropical rainforests have the **greatest biodiversity** — more species than any other biome.

Desert Biome

Deserts are found in hot, dry areas like the **Sahara, Arabian, and Australian deserts**.

Rainfall is **very low**, and the temperature is **high during day and low at night**.

The soil is sandy and has **very little water**.

Plants such as **cactus and thorny bushes** have thick stems to store water.

Animals like **camels, snakes, and lizards** survive with little water.

Deserts look empty, but they are full of life adapted to extreme heat and dryness.

Some deserts are cold, like the **Gobi Desert** in Asia.

Grassland Biome

Grasslands are wide open areas covered mostly with **grasses and few trees**.

They get **moderate rainfall**, which is not enough for large forests but enough for grass.

They are found in **central parts of continents**, such as the **prairies in North America, pampas in South America**, and **savannas in Africa**.

Grasslands are home to large animals like **zebras, lions, bison, and elephants**.

The soil in grasslands is very **fertile** and good for farming.

They are important for **agriculture and livestock** because of open land and grass.

Temperate Forest Biome

Temperate forests are found in areas with **four clear seasons — spring, summer, autumn, and winter**.

These forests have **moderate rainfall** and **mild temperatures**.

The trees are mostly **deciduous**, which means they **shed their leaves** in autumn and grow them again in spring.

Common trees include **oak, maple, and beech**.

Animals such as **deer, foxes, squirrels, and birds** live here.

The soil is **rich and moist**, helping many plants to grow.

Temperate forests are found in **Europe, eastern USA, and parts of China**.

Taiga (Boreal Forest) Biome

The taiga, also called the **boreal forest**, is the **largest land biome**.

It is found in **northern regions** like Canada, Russia, and Scandinavia.

The climate is **cold**, with **long winters and short summers**.

Most trees are **evergreen conifers** like pine, fir, and spruce.

These trees have **needle-like leaves** to protect them from snow and cold.

Animals such as **bears, wolves, moose, and owls** live in taiga forests.

The soil is thin and not very fertile because of the cold.

Tundra Biome

The tundra is found near the **North Pole** or at the tops of **high mountains**.

The ground stays **frozen all year**, called **permafrost**.

The weather is very **cold and windy**, and winters are long and dark.

Only **small plants like mosses, lichens, and grasses** can grow in short summers.

Animals such as **polar bears, arctic foxes, and reindeer** live here.

The tundra has **low biodiversity**, but its species are well adapted to survive extreme cold.

Savanna Biome

The savanna is a **tropical grassland biome** found in Africa, South America, and Australia.

It has a **hot climate** with **two main seasons — a wet season and a dry season**.

There are many grasses with **few scattered trees** like acacia and baobab.

Animals such as **lions, giraffes, elephants, zebras, and antelopes** live here. During the dry season, many plants turn brown and animals migrate for water. Savannas are important for **wildlife** and **tourism**, especially in Africa.

Factors Affecting Biome Distribution

Biomes are not placed randomly — they depend on **environmental factors**.

- **Temperature:** Warm areas have tropical biomes; cold areas have tundra and taiga.
 - **Rainfall:** Wet areas grow forests; dry areas become deserts or grasslands.
 - **Latitude:** Closer to the equator = hotter, farther = colder.
 - **Altitude:** Higher areas are colder, so mountain tops may have tundra.
- These factors together decide where each biome will exist.

Main Characteristics of Biomes

Each biome has a unique combination of:

- **Climate** (weather patterns like heat and rain)
- **Soil** (type and nutrients)
- **Vegetation** (plants suited to that climate)
- **Animals** (species adapted to live there)

Living things in each biome form **food chains and food webs**.

They depend on one another — if one part is damaged, the whole system is affected.

Importance of Biomes

Biomes are **essential for life on Earth**.

They provide **oxygen, food, medicines, and raw materials**.

They help **control temperature and rainfall patterns** and store carbon dioxide.

Forests clean the air, wetlands clean water, and grasslands feed animals.

Without healthy biomes, humans and wildlife cannot survive.

Threats to Biomes

Human activities are **damaging natural biomes** around the world.

Deforestation, pollution, urbanisation, and global warming are major threats.

Cutting forests reduces biodiversity, while pollution harms water and soil.

Climate change is shifting the boundaries of many biomes, making them unstable.

If not protected, many species may **go extinct** and ecosystems may **collapse**.

Protecting and Conserving Biomes

We must take action to **save our biomes** for future generations.

Planting trees, saving water, and using less plastic can help protect nature.

Governments should create **protected areas, wildlife parks, and conservation laws.**

People must learn about biomes and their importance in school and daily life.

When we care for nature, it gives us a safe and healthy planet in return.