

## 8. Biomes



### Let's recall.

Look at the fig. 8.1. Answer the following questions:

- 1) What does the figure show?
- 2) What do the numbers on the figure represent?
- 3) How does latitude influence the vegetation?
- 4) How does latitude influence the fauna of a place?
- 5) Which latitude will have more biodiversity?

### Geographical explanation

As shown in the figure, a variety of natural vegetation and wildlife is found in different regions of the world from the equator to the poles. These changes occur according to latitudes. Thus, we see that in the same region, different types of plants and animals co-exist together. Such an area where different types of flora and fauna live together in the same region in the same type of climatic conditions is called a biome. Thus, a biome can be defined as the total assemblage of plant and animal species interacting within specific conditions.

**Fig. 8.1**



### Think about it.

Besides latitudes, what other conditions influence the biome?

### Geographical explanation

The boundaries of different biomes on land are determined mainly by climate. These include conditions like rainfall, temperature, humidity, amount of insolation received and soil conditions. Different types of trees and animals living in a biome are adapted to the climatic conditions found in that region. We will classify biomes on the basis of climatic conditions in this chapter.

### Difference between biomes and ecosystem :

The combined co-existence of flora and fauna which is a result of the region's climate is known as biome.

In a given region, the interaction between biotic and abiotic factors is known as ecosystem.

The biotic factors consist of plants, various types of animals, bacteria, etc. The abiotic factors consist of soil, water, sunlight and nutrients. Through the abiotic factors, the biotic components receive supply of nutrients and energy. This happens through various food chains and food webs. There are various trophic levels in an ecosystem.

The first trophic level starts from the plants and different animals, birds or reptiles are found on the subsequent trophic levels. The biome decides which animals and plants will be on each of the trophic levels. For example, river ecosystem is a type of ecosystem. But if the river is in equatorial region, it will have different plants and animals on various trophic levels than the river in a temperate region. Different biomes will have different animals or plants on the same trophic levels. There can be many ecosystems within a biome.



Make friends with maps!

# BIOMES

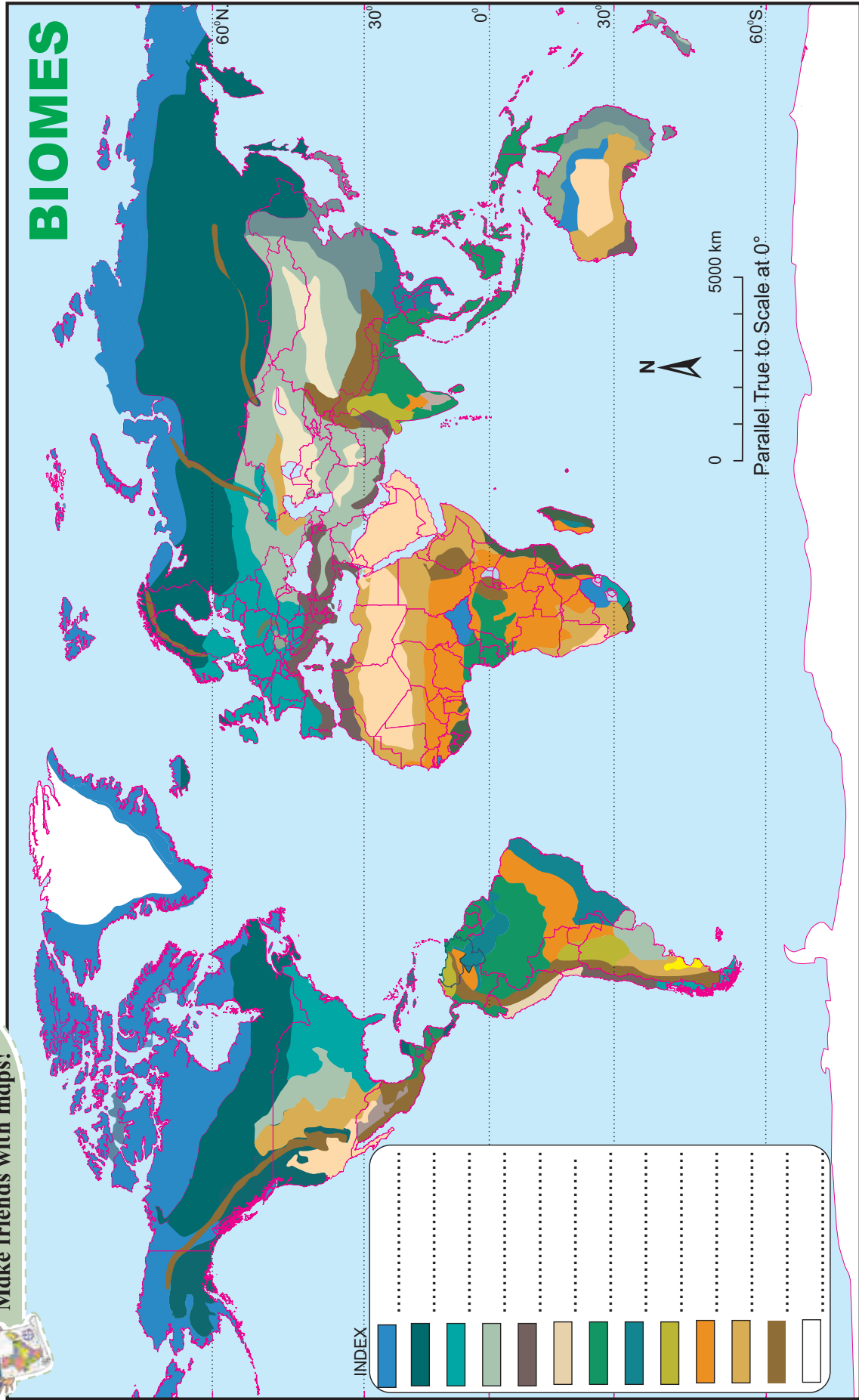


Fig. 8.2



### Try this.

Find out more differences between an ecosystem and a biome. You can use the following points: scale of area occupied, types, flow of nutrients and energy, examples, etc.



### Can you tell?

A person staying in Sahara desert and a person staying in Arabian desert belong to the same biome or ecosystem?

## Terrestrial Biomes :

You have already studied about the climatic conditions in Chapter 4. Refer to them when you study each of the biomes.

### 1) Tropical rainforest biome :

**Latitudinal extent :** 0° to 10° N and S



### Try this.

- 1) Various biome regions have been shown on the map in figure 8.2. Considering the latitudinal location, select tropical rainforest biome and write the name in its respective place in the index.
- 2) Write the names of the major countries that lie in this biome.

**Vegetation :** In this biome, biodiversity is very high. More than half of the species found on the Earth are found in this biome. Most trees are broad-leaved and grow densely. They are usually 50 m tall. To acquire sunlight, many trees grow taller. They have a dense canopy which looks like a roof.

These forests can be categorized into three layers mainly on the basis of the height of the trees. In the most underneath layer, dense growth of bushes covers the ground. The second layer consists of low trees while the third layer consists

of very tall and huge trees. In between, we find hundreds of climbers and creepers. These forests are, therefore, very dense.

The soils are very fertile and contain lot of humus. Most of the trees are hard-wooded trees. Mahogany, ebony, rosewood, rubber, palms, coconut, orchids, wild flowers, ferns, etc. are found here. See fig. 8.3.

**Animals life :** Monkeys, birds from the vulture family, hornbills, parrots etc are found. Various species of insects, butterflies, reptiles, etc are also found in huge numbers in this biome. As the trees have a three-tier system, every bird and animal has its own niche in the areas from the ground to the top of the tree. These species only inhabit their respective areas only.

**Human life :** Human life is not very easy in this climate. Indigenous humans in these parts are still in their primitive stage. They are engaged in primary occupations such as gathering forest products, hunting, etc. For example, Pygmies in Congo, Boro Indians in Amazon, Sentinels Onges, Jarawahs, etc. in Andaman and Nicobar Islands in India,

**Use of biome by man :** Hardwood is used in construction and making furniture. For this, some regions are being over exploited. For example, Brazil, Java-Sumatra islands.

**Current scenario :** There is a degradation in this biome because of increasing agriculture and industrialisation. The biodiversity found in this biome is getting destroyed. Golden lion tamarin, gorilla, orang-utan, harpy eagle, chimpanzee, poison dart frogs are threatened. At the same time, many new species are still being discovered in this biome.



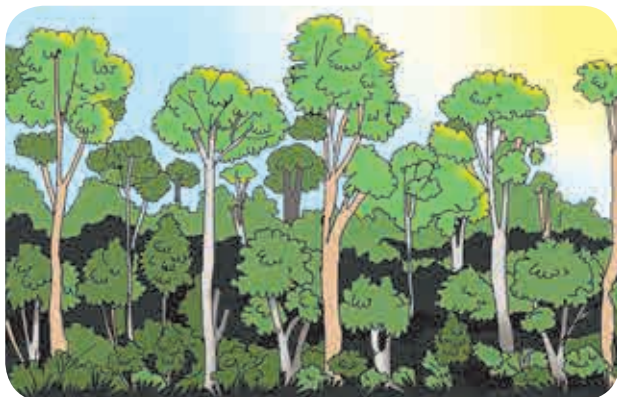
### Find out !

Find out the regions in this biome where plantation agriculture has developed.



### Try this.

Obtain information about those species of plants, animals and birds which were easily found in your surroundings around 20 years ago. Also, find out if they are still found easily in your surroundings. Discuss about them in your class. Write down your observations.



**Fig. 8.3 : Tropical rainforest biome**

## 2) Tropical deciduous biome :

**Latitudinal extent :** 5° to 30° N and S.

You have already studied about the climatic conditions in this biome in Chapter 4. Study the biome on that basis.



### Try this.

- 1) Various biome regions have been shown on the map in figure 8.2. Considering the latitudinal location, select Tropical deciduous biome and write the name in its respective place in the index.
- 2) Write the names of the major countries that lie in this biome.

**Vegetation :** The trees shed their leaves in dry season and are dense and lush in rainy season. Therefore these forests are called deciduous forests. In wet forests, trees are tall and extensive. The branches are large in size and the roots of the trees are large and deeply rooted in the ground.

The density of the trees is less in deciduous forests than rainforests. These are not found in a row continuously. They are found in groups in a dispersed manner. The trees are shorter and like shrubs.

Teak is the main tree in this biome with respect to its economic value. Various types of bamboos, teak, sal, rosewood, sandalwood, oiltree, etc are other important trees. See fig. 8.4.

**Animal life :** In tropical and sub-tropical biomes, a large diversity exists in fauna. The biodiversity found in these biomes ranks second in the world. This ranges from microscopic organisms till large elephants, hippopotamus, rhinos, tiger, lion, gaur, monkeys, etc. Greater Coucal, hornbills, Asian koel, peacock, vultures, falcon, pigeons, sparrows, etc. are found here. Similarly, ants, butterflies, insects and worms are also found in plenty. In this biome, many species of animals can be reared.

**Human life :** The human life in this biome is easier than that in the rainforest. Primary and secondary occupations based on forests are found here. By rearing the animals found here, animal husbandry, milk production and meat production is carried out. In earlier times, animals such as bull, horse and donkeys were used for transportation and ploughing the fields. Various tribal communities inhabit the regions under this biome. One can find rural and urban areas too. As a result of expanding human settlements, the forests under these biomes are being encroached upon.



### Find out !

Look for the names of the tribes dependent on this biome in India including Maharashtra along with their habitats and show them on a map of India.

**Use of biome :** The wood obtained from teak is mainly useful for furniture, construction, ship-building, for making berths in railways, etc. Many plants are used for making medicines



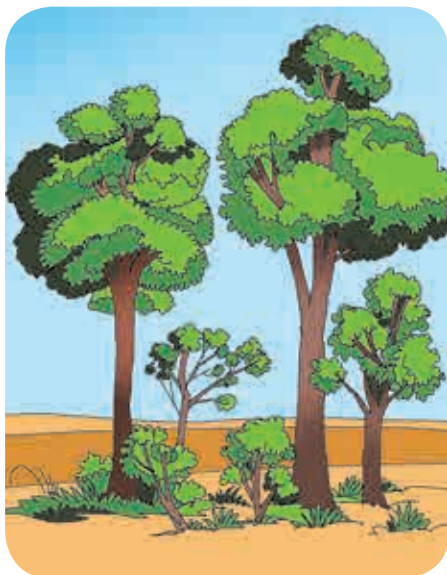
and secondary products. For example, oil from sandalwood, its scented wood, etc. The bamboos are used for construction of houses and agriculture. Besides, various fruits and spices are also obtained.



### Let's recall.

Make a list of products found in your home which have come from this biome.

**Current status :** The forests in these biomes are in danger because of deforestation and wildfires. Extensive use of fertilizers by human and spray of insecticides has threatened many wild species. For example, The white-rumped vulture. This biome is being influenced by the human population.



**Fig. 8.4 : Tropical deciduous biome**

### 3) Savannah grassland biome :

**Latitudinal extent :** 10° to 20° N and S

You have already studied about the climatic conditions in this biome in Chapter 4. Study the biome on that basis.



### Try this.

- 1) Various biome regions have been shown on the map in figure 8.2. Considering the latitudinal location, select Savannah

grassland biome and write the name in its respective place in the index.

- 2) Write the names of the major countries that lie in this biome

**Vegetation :** These grasslands are characterised by continuous cover of perennial grass that grows about 3 to 6 m height. The grass is thick, coarse and broad-leaved. It is known as elephant grass. There are very few shrubs and trees found here. The number of grass-eating animals is more here. Therefore, carnivores which are dependent on them are also high here. See fig. 8.5.

**Animal life :** The abundance of grass cover and its perennial nature have made savanna biomes rich in herbivore animals. Seasonal change in colour of grass has provided natural shelter for animals. These grassland support large number of hoofed animals. A variety of herbivore animals of different size from rabbits to elephant are found here. Main species are antelopes, buffalo, zebra, rhinos, wild beasts, giraffes, elephants, warthogs, etc. Obviously with rich herbivores density, these grasslands also support a number of carnivore animals as well. They include variety of Cats like lions, leopards, cheetah, wild dogs, Jackals, hyenas, etc. In birds, vultures, great Indian bustards, twitter and ostriches are found.

**Human life :** Human life is comparatively difficult here. In the grassland areas of Africa, Masais live here along with their cattle.

**Use of biome :** As number of wild animals are more in this biome, in earlier times, human used to hunt for trophies. Infact, these areas were known as the heaven for hunting.

**Current status :** Savanna grasslands are victims of frequent forest fires that cause severe loss of biodiversity of region. Overgrazing and industrialisation is leading to decrease in area

under grassland. This leads to increase in extent of the Sahara desert in Africa. Besides, the area under forests is being taken up for agriculture.



### Find out !

Obtain information regarding the tribes inhabiting this biome. Find out about their habitat, life-style, conventional ways of living with nature, cultural heritage, etc.



**Fig. 8.5 : Savannah grassland biome**

#### 4) Tropical desert biome :

**Latitudinal Extent :** 20° to 30° N and S

You have already studied about the climatic conditions in this biome in Chapter 4. Study the biome on that basis.



### Try this.

- 1) Various biome regions have been shown on the map in figure 8.2. Considering the latitudinal location, select Tropical desert biome and write the name in its respective place in the index.
- 2) Write the names of the major countries that lie in this biome

**Vegetation :** The vegetal life is found in a dispersed manner. This includes date palms and thorny trees such as khejari, acacia and bushes such as century plant, cactus etc. There is hardly any vegetal cover because of dry climatic conditions. See fig. 8.6.

#### Characteristics of forests:

- 1) Thick leaves with capacity to store water
- 2) Thorny nature reduces speed of evaporation, safety from animals
- 3) Trunk like leaves carry out photosynthesis

**Animal life :** As the vegetation is sparse, biodiversity is also limited. There are relatively few large animals in desert. The animals are small and tend to burrow, or stay in hideaways till dusk to avoid the heat. They are adapted to survive in hot climate with very little water. They are mainly small carnivores, camels, many species of snakes, types of lizards, desert turtles, rats, mongoose along with goats, sheep, donkeys, etc.

**Birds :** Ostriches; various raptors; guinea fowl, and bustards; desert eagle owls and barn owls; sand larks and pale crag martins; and brown-necked and fan-tailed ravens.

**Insects :** Houseflies, beetles, moths, types of termites, etc.

**Human life :** As this biome has extreme temperatures, the human life is very difficult here. Depending on the availability of water, animal husbandry or agriculture might be followed. Human settlements are found only near oases. They occur in a dispersed pattern. Here you can find nomadic life in some areas. In earlier times, Bedouin tribe used to trade by travelling on camels.

**Use of biome :** Dates are important as food item across the world. Agriculture is being carried out with the help of irrigation. Minimal vegetation has made it easier to extract minerals from these regions.

**Current status :** As sand from this part is getting transported to nearby regions, desertification is increasing. As a result, desert area is spreading in regions such as the Nile valley.



### Think about it.

In which region in India, is desertification occurring?



### Can you tell?

- 1) The tropical deserts are mainly found in which direction of the continents? What could be the reason behind their formation there?
- 2) In which continent is desert not found?



**Fig. 8.6 : Tropical desert biome**

### 5) Mediterranean biome :

**Latitudinal extent :** 30° to 40° N and S

You have already studied about the climatic conditions in this biome in Chapter 4. Study the biome on that basis



### Try this.

- 1) Various biome regions have been shown on the map in figure 8.2. Considering the latitudinal location, select Mediterranean biome and write the name in its respective place in the index.
- 2) Write the names of the major countries that lie in this biome

**Vegetation :** In this vegetation, the height of the trees is less. The vegetation is mixed type: evergreen and deciduous. The leaves of the trees are waxy and thick. As a result, the evaporation is less and they can sustain longer in tough conditions. Here trees of the citrus family and shrubs of coloured flowers are found. Rosemary, cork, oak, olive, eucalyptus, peach, pine, sweet chestnut, cedar, cyprus, etc. are found. See fig. 8.7.

**Animals life :** Rabbits, deer, goats, pigs, horses, brown bears, fox, berry deer, wild cats, goats and sheep are found. Vultures, eagle are found in high numbers here. Alligators, reptiles are also found. Various types of insects and honeybees are found.

**Human life :** The climate here is very pleasant and hence human life has flourished here very well. Various industries based on fruits and flowers have flourished here. These include making wine, packing fruits in air tight containers,, processing olive oil, making jellies out of fruits, making perfumes out of flowers, etc. Due to natural beauty, pleasant climate, fruits and flowers make this area ideal for tourism and development of cinema industry here.

**Current status :** As the tertiary occupations have increased here, urbanisation has increased. The biodiversity found in plants and animals is decreasing as a result of human interference.



**Fig. 8.7 : Mediterranean biome**

### 6) Temperate deciduous biome :

**Latitudinal Extent :** 40° to 50° N and S mainly in the eastern parts of the continents

You have already studied about the climatic conditions in this biome in Chapter 4. Study the biome on that basis.



### Try this.

- 1) Various biome regions have been shown on the map in figure 8.2. Considering the latitudinal location, select Temperate



deciduous biome and write the name in its respective place in the index.

- 2) Write the names of the major countries that lie in this biome

**Vegetation :** Here, the trees have broad leaves. The vegetation here has adapted to the cold climate here. They are found in three layers. Tall growing trees (18 to 30 m), short trees and shrubs such as laurels and berries. In this biome, hardwood and deciduous trees are found. Examples are beech, elm, chestnut, oak, willow, cherry, maple, pine, walnut, deodar, etc. See fig. 8.8.

**Animal life :** In this biome, animals having thick and soft fur like brown bears, red fox, sable, mink, etc. are found. Birds such as peregrine falcon, woodpecker, cardinals can be seen. Similarly, many types of insects are also found.



#### Try this.

Read the following news item.

*A grizzly bear that killed a mother and her baby in Yukon last fall was emaciated and desperately pursuing unusual food sources at the time of the attack, according to an investigation by the territory's government. Valérie Théorêt, 37, and her 10-month-old daughter, Adèle Roesholt, died on Nov. 26, 2018, when a grizzly bear attacked them near their trapping cabin in the remote Einarson Lake area northeast of the village of Mayo. Gordon Hitchcock, chief conservation officer for the Government of Yukon, said the 18-year-old male grizzly bear was emaciated to the point that it was incapable of hibernation. Additionally, it was in significant and chronic pain from having eaten a porcupine – which bears do not typically eat – and had quills penetrating its digestive system from mouth to stomach. “This bear had started*

*turning to uncommon food sources,” said Mr. Hitchcock, who presented findings of a necropsy in Whitehorse on Wednesday.*

-CNN News

- Why do such things occur?
- Give examples of such similar incidents in Maharashtra where in some animal has attacked people in a particular region.

**Human life :** The forest bounty here provides food, wood and ample amount of oxygen. The forest is cut for wooden products. Paper (for newspapers), paper bags, etc. it is seen that forests are being encroached upon for agriculture.

**Current status :** This biome is reducing because of agriculture and encroachment by settlements. And, therefore, sometimes, animals enter the human settlements in search of food. The biodiversity has reduced in this region. The habitat of these animals is being encroached upon.



**Fig. 8.8 : Temperate deciduous biome**

#### 7) Temperate Grasslands biome :

**Latitudinal extent :** 40° to 55° N and S

You have already studied about the climatic conditions in this biome in Chapter 4. Study the biome on that basis



#### Try this.

- 1) Various biome regions have been shown on the map in figure 8.2. Considering the latitudinal location, select Temperate



Grasslands biome and write the name in its respective place in the index.

- 2) Write the names of the major countries that lie in this biome

**Vegetation :** In this vegetation, grass is dominant. The grass is soft. As the rainfall is just sufficient, the wetness does not reach the lower layers of the soil. Therefore, not many types of trees are found. Despite, willow, elder, poplar trees are found along the streams. The various species of grasses include purple needle grass, blue grama, buffalo grass, and galleta.

As rainfall is less, the moisture in the soil does not reach the sub-surface. This is the reason why trees are almost absent. But willow, elder, poplar trees can be found near the streams. Grass is green during rainy season. Flowers include asters, blazing stars, coneflowers, goldenrods, sunflowers, clovers, psoraleas, and wild indigos. See fig. 8.9.

**Animal life :** The animal life in this biome is very rich and varied. Herbivore animals include gazelles, zebras, wild horses, wolves, deer, rabbits while coyote is a carnivore. In Veld grasslands, ostriches are found. In Downs of Australia, kangaroos and dingos are found.

**Human life :** Human settlements are sparse here. Earlier, hunting was the main occupation here. Now, it is favorable for agriculture and animal rearing. Now, livestock raising is done on a large scale here to obtain meat, milk, wool, hair and hide. In grassland regions such as Prairies, Steppes, Downs, Pampas, Velds, etc. extensive type of agriculture has developed. Crops like maize, wheat are produced on a large scale. The fields extend to hundreds of hectares and therefore advanced machines are used for agriculture. As these areas have abundant yields, the countries lying in this biome are famous as exporters. The Marino sheep of Australia is world famous for its quality wool.



### Find out !

Find out the names of the countries who produce and export wheat and maize.

**Current Status :** The extent of commercial agriculture is increasing in this area. Industries are also increasing. Also meadows and pastures are reducing because of over grazing. Consequently, the biome is getting degraded.



**Fig. 8.9 : Temperate Grasslands Biome**

### 8) Taiga biome :

**Latitudinal extent :** 50° to 55° N

You have already studied about the climatic conditions in this biome in Chapter 4. Study the biome on that basis



### Try this.

- 1) Various biome regions have been shown on the map in figure 8.2. Considering the latitudinal location, select Taiga biome and write the name in its respective place in the index.
- 2) Write the names of the major countries that lie in this biome

**Vegetation :** One type of tree species is the characteristic of this biome. Evergreen coniferous forests are found here. The resin and the oil in these trees helps them to face the tough climate. Trees are tall and tapering to the apex. Leaves are waxy and branches tapering to the ground. This structure does not let snow stay on the trees.

Spruce fir, Douglas Fir, pine, juniper, cedar larch, oak, hemlock etc. are the major species of trees found here. Raspberry, salmonberry, gooseberry, strawberry, blueberry, etc. are fruit trees found here. See fig. 8.10.



### Can you tell?

In India, where do you find such fruits? What are the reasons for them being found here?

**Animal life :** As the ground is snow-covered for the most part of the year, the animals here have thick hides. They have a thick layer of fats and are hairy. Reindeer, grizzly bears, elk, caribou, etc are herbivores found here. Fox, mountain lions, puma and panthers are the carnivores.

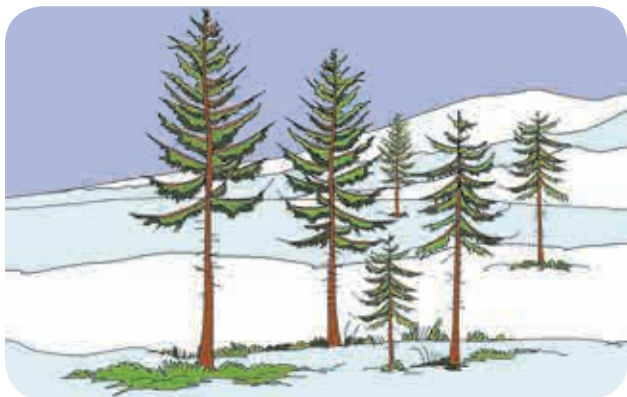
**Human life :** As the climate is very cold here, human settlement is sparse. The coniferous trees are famous for their soft wood. Thus lumbering is followed here on a large scale. Saw mills, paper pulp and wooden furniture industries are found here.

**Current status :** Only one type of species is found here in a large area. The remoteness of the forests is less here. Deforestation is easy here as the wood is soft.



### Think about it.

Why is this type of biome not found in Southern Hemisphere!



**Fig. 8.10 : Taiga biome**

## 9) Tundra biome :

**Latitudinal extent :** 65° to 90° N , Regions south of the ice caps of the Arctic and extending across North America, Europe, and Siberia.

You have already studied about the climatic conditions in this biome in Chapter 4. Study the biome on that basis



### Try this.

- 1) Various biome regions have been shown on the map in figure 8.2. Considering the latitudinal location, select Tundra biome and write the name in its respective place in the index.
- 2) Write the names of the major countries that lie in this biome

**Vegetation :** The Tundra is the coldest of the biomes. The ground is frozen for 8 months of the year . There is a layer of permanently frozen ground below the surface, called permafrost. This permafrost is a defining characteristic of the tundra biome. In the tundra summers, the top layer of soil thaws only a few inches down, providing a growing surface for the roots of vegetation.

Vegetation in the tundra has adapted to the cold and the short growing season. Mosses and lichens are common, while few trees grow in the tundra. The trees that do manage to grow stay close to the ground so they are insulated by snow during the cold winters. See fig. 8.11.

**Animal life :** Animal life is very scarce here. Thick fur and layer of fats in their body helps them to face very cold climate. Herbivores such as musk ox, bears, reindeers, caribou, lemming, rabbits along with carnivores like Arctic fox, dogs, jackals are found. Ptarmigan, ravens, snowy owls, and redpolls-remain year-round in the tundra. The bulk of arctic birds are migrants. In coastal areas, seals and walruses are found.

**Human life :** Because of very cold climate, human settlements are very sparse. Lapps,

Samoyeds and Eskimos live in adverse climate. Life of Eskimos has changed after they have come in contact with Westernizers. As they have started getting advanced instruments, their life has changed and fishing methods have changed. Thus they have started exploitation of fish is happening at a higher speed in this biome.



### Think about it.

Which activities of human life are affected most by the cold climate ?

**Current status :** This biome is seeing development due to increased transportation and means of communication. The standard of life has improved and this has affected the protected factors of this biome. Due to global warming, the snow cover and the species dependent on it are getting affected badly.



**Fig. 8.11 : Tundra biome**

### 10) Mountain or highland biome :

**Latitudinal Extent :** Not specific; depends on altitude, slopes of high mountain ranges such as the Himalayas, the Andes and the Rockies

You have already studied about the climatic conditions in this biome in Chapter 4. Study the biome on that basis.



### Try this.

- 1) Various biome regions have been shown on the map in figure 8.2. Considering the

latitudinal location, select Mountain or highland biome and write the name in its respective place in the index.

- 2) Write the names of the major regions that lie in this biome

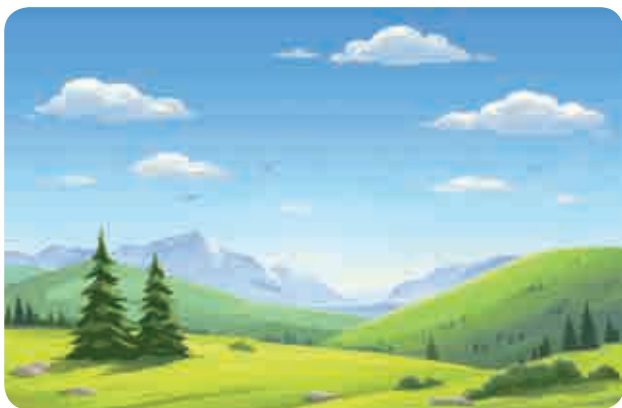
**Vegetation :** The vegetation here ranges from deciduous to tundra varying according to altitude. Because of low temperatures and the winds, most plants are small and perennial. In Himalayas, for example, Rhododendron plants grow on most mountains. Oak, laurel and chestnut trees are also found up to 2000 m above sea level. Pine trees are found up to 4000 m. Beyond that, only lichens, grass and moss can be found. Regolith soils are found over slopes which are not very fertile. See fig. 8.12.

**Animal life :** Fauna hence any deer, bears, wolves, mountain lions, leopards, squirrels, rabbits, and a wide variety of birds, reptiles, and amphibians. Animals with special adaptation to snow can be found. In Himalayas, for example, one of the main animals of this mountainous biome here is the yak. It has a lot of long hair for warmth. Other animals are tigers, monkeys, leopards and elephants according to altitude.

**Human life :** In some regions, people grow crops such as tea, rice and barley on mountains. Grazing and sheep rearing are primary occupations. Tourism has developed in such biomes. People come here for trekking, para-gliding, and to get relief from heat. Transhumance is also practiced. Sherpas, Bakarwals, Lepchas Bhutiyas etc. are communities living in Himalayan mountain biomes.

**Current status :** These places are being over crowded now because of over –tourism. Mountain biomes are also threatened by deforestation, wildfires, hunting, poaching, and urban sprawl.





**Fig. 8.12 : Mountain or highland biome**

### Aquatic biomes :

You have now studied the terrestrial biomes of the world. Besides, these biomes we find biomes in the water too. Here, the plants and animals have adapted themselves to the existing climatic conditions. Approximately 70% of the earth's surface is covered by oceans. Besides the oceans, we have rivers, lakes, etc which are freshwater sources. The aquatic biomes consist of any part of the earth that is covered with water. This includes freshwater and salt water. The aquatic biome can be further divided into freshwater biomes, marine biomes, wetland biomes, coral reef biomes, estuaries, etc. These sub-divisions are based on the salt content of the water and the aquatic plants

that live there.

In marine biomes, there are three layers to recognize. The top layer is euphotic. The sunlight reaches here. This can be around 200 m deep. This is home to many fishes, sea turtles, jellyfish, seals, coral, zooplankton, and mangroves.

In the middle is the disphotic layer. Here, some light penetrates to the bottom part. This is around 1000m deep from mean sea level. Except few phytoplanktons sunk from upper layer, plants are not found here. Squid, catfish, wolfish, swordfish, eels, sea dragons, etc. are found. The animals are adapted to darkness, cold water and high pressure.

The third layer is the deepest layer known as apotic layer. It ranges from 1000m to 4000m depth. No light penetrates here. There is no living plant life. Inhabitants of this cold, dark environment include elusive giant squid, bioluminescent jellyfish, angler fish, hatchet fish, etc. Sperm whales enter this zone to hunt but return to the upper layers.

Beyond the layer, lies the darkest and the deepest zone extending upto the sea floor. Here, the animals are adapted to survive on detritus under even greater pressure.



### Exercise

#### Q. 1. A) Complete the chain :

A	B	C
1) Boreal forest	1) Hard wood species of trees	1) Siberia
2) Deserts	2) Tropical deciduous forest	2) Myanmar
3) Teak	3) Wide spectrum of bio-diversity	3) Sahara Desert
4) Tropical rain forest	4) Tundra Region	4) Brazil
	5) Taiga forest	5) Greenland
	6) Narrow spectrum of bio-diversity	

#### Q. 1 B) Fill in the blanks with appropriate alternatives given below and rewrite the sentences.

1) Ecosystem consists of interaction between ..... and abiotic factors.

- a) Biotic factors                      b) Animals  
c) Human beings                      d) Plants
- 2) The original meaning of savanna is.....

- a) Land with many trees.
  - b) Extensive perennial grass land.
  - c) Land which is full of trees with much grass.
  - d) land which is without trees but with much grass.
- 3) In Africa tropical evergreen forest is predominantly found in ..... .
- a) Amazon basin
  - b) Sahara desert
  - c) Congo basin
  - d) Savanna
- 4) Mediterranean forest is also known as ..... forests.
- a) Hard wood
  - b) Chaparral
  - c) Man made
  - d) Soft wood

**Q.2 A) Arrange the given statements as per given instructions.**

- 1) Arrange the following biomes in proper order from Equator to Pole.
- a) Tundra                      b) Tropical rain forest
  - c) Boreal forest            d) Sahara desert

**Q. 2. B) Select the inappropriate factor or statement**

- 1) Trees in the tropical rain forest-
- a) Mahogany                      b) Ebony
  - c) Pine                              d) Rosewood
- 2) Temperate grasslands in the world.
- a) Prairies – North America
  - b) Steppes – Eurasia
  - c) Downs – Africa
  - d) Pampas – South America.

- 4) Major hot deserts in the world are-
- a) Gobi – Asia
  - b) Kalahari – Africa
  - c) Atacama – South America
  - d) Arabian – Asia

**Q. 3) Give geographical reasons:**

- 1) The trees in the tropical rainforests are broad-leaved while those in the Taiga are coniferous.
- 2) Desert biomes have thorny vegetation.
- 3) Lumbering activity has developed in Taiga forests.
- 4) Mediterranean biome has proved to be a catalyst to the development of cinema industry.

**Q. 4) Write short notes on:**

- 1) Agriculture in temperate grassland biome
- 2) Human life in Tundra biome
- 3) Animal adaptation in grasslands
- 4) Marine biomes

**Q. 5) Distinguish between :**

- 1) Biome and ecosystem.
- 2) Tropical and temperate grassland biomes.
- 3) Human activities in tropical evergreen and Monsoon regions.

**Q. 6) Answer in detail :**

- 1) Give an account of the desert biome with the help of following points :
  - a) location      b) plant life
  - c) animal life    d) human life
- 2) Explain the reasons behind deforestation in your area. What measures will you suggest to minimize deforestation?

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