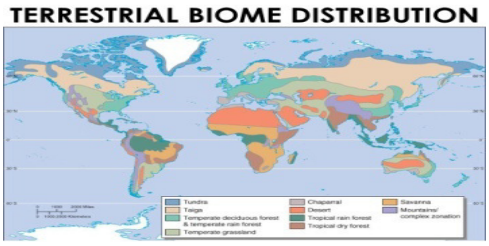
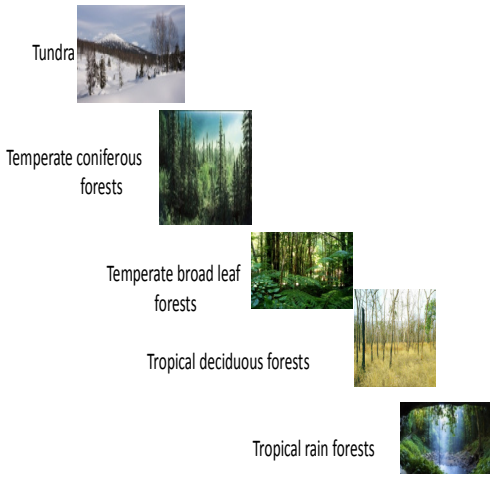
6. NATURAL ECOSYSTEM

- Different landscapes have different vegetation patterns due to physical and geographical factors such as rainfall, temperature, elevation, soil type etc.
- A natural ecosystem is an assemblage of plants and animals which functions as a unit and is capable of maintaining its identity such as forest, grassland, an estuary.
- A natural ecosystem is totally dependent on solar energy.
- Terrestrial (forest, grass land, desert and tundra) and aquatic (fresh water-rivers, lakes, ponds and marine– oceans, estuary)



- Forests are large area supporting rich growth of trees. Tropical rain forests, temperate deciduous and boreal or north coniferous forests are the main types of forest.



Types of forests	Tropical rain forest	Temperate deciduous forest	Boreal or north coniferous forest
Distribution	High rainfall area. S.E. Asia, coast of India, some part of Africa and S. America	N-W, Central and eastern Europe, N. China, Korea, Japan, far east Russia and Australia	Also known Taiga, North America, North Eurasia below Artic Tundra,
Climate	High temperature and humidity, rainfall 200 cm/year, humus rich soil	Moderate climatic conditions with 6 months, rainfall 75-159 cm, brown soil with rich in nutrients	Cold with long harsh winter, temperature below 0ºC, soil in acidic nature
Flora	Upto 50 m long tress, wines and creepers	Oak, Heath, Chest nut, Birch, Pine.	Conifers- Spruce, Fir, Pine trees
Fauna	Monkey, flying squirrel, camel, centipede, insects	Prominent grazers, rodents, black bear, raccoons, wild cat, wolves, fox and skinks.	Red squirrels, deer, goat, mule, moose, wolves, bear, robins and sparrow.

- Grassland is areas dominated by grasses, occupied 20% of land surface.
- Grassland is known as Praires in North America, Steppes in Eurasia, Savanna in Africa and India, Pampas in South America

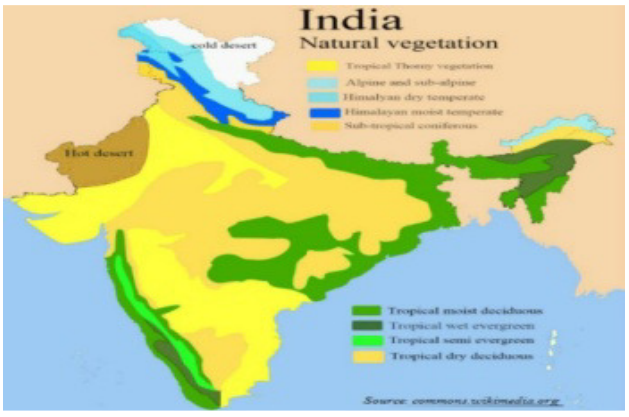
- Grasses are dominating plants and badgers, fox, ass, zebra, antelope, rodents, reptiles and insects are found in grassland.

- Deserts are hot and low rain areas suffering from water shortage and high wind velocity. They show extremes of temperature. Globally deserts occupy about 1/7th of the earth's surface.

- Cacti, Acacia, Euphorbia and prickly pears are examples of desert plants. They have very specific characteristics such as succulent stems and leaves, thorns present, mostly common desert plants.
- Desert animals include shrew, fox, wood rats, rabbits, camels and goat reptiles, furrowing rodents and insects
- An aquatic ecosystem refers to plant and animal communities occurring in water bodies. Aquatic ecosystems are of two types i.e. freshwater and marine.
- Tundra is found in those regions of the world where environmental conditions are very severe. There are two types of tundra- arctic and alpine.
- Arctic tundra occupies the northern fringe of Canada, Alaska, European Russia, Siberia and island group of arctic ocean whereas Anatarctica tundra in the south pole is very small since most of it is covered by ocean .
- Typical vegetation of arctic tundra is cotton grass, sedges, dwarf heath, willows, birches and lichens.
- Animals of tundra are reindeer, musk ox, arctic hare, caribous, lemmings and squirrel.
- Aquatic ecosystems refer to plant and animal communities occurring in water bodies it classifies as freshwater and marine.
- Water on land which is continuously cycling and has low salt content is known as fresh water and its study is called limnology.
- Static or still water (Lentic) e.g. pond, lake, bogs and swamps.
- Running water (Lotic) e.g. springs, mountain brooks, streams and rivers.
- Aquatic organisms can be floating in water or free swimming or sedentary (fixed), depending on their size and habit.
- Wetlands are areas that periodically get inundated with water and support a flourishing community of aquatic organisms including frog and other amphibians. Swamps, marshes and mangroves are examples of wetlands.
- Marine ecosystem pertains to the seas and oceans including marine organisms.

- Marine ecosystem covers nearly 71% of the earth's surface with an average depth of about 4000 m.
- Salinity of open sea is 3.6% and is quite constant.
- Biodiversity of the marine ecosystems is very high as compared to terrestrial ecosystems.

Vegetation in India as follows:



S. No	Types of ecosystem in India	Distribution	Climate	Flora and Fauna
Terrestrial				
1.	Forests (i) Tropical rain forests	Western Ghats, WB, Odisa and North-East region	200 cm rain	Ebony, Mahogany, Rosewood
	(ii) Tropical deciduous forests or deciduous forests	Kerala, slopes of western Ghats, NE, valley of Himalayas, Chhota Nagpur plateau, MP, N. Bihar, W. Odisa, Shivalik.	200 and 75 cm annual rainfall	Teak, Sal, Sandalwood
	(iii) Temperate broad leaf forests	1500-2000m altitude of western Himalayas.	70 to 200 cm annual rainfall	Oak species
	(iv)Temperate needle leaf or Coniferous forests	Himalayas regions.	1700 to 3000 m altitude	Pine, Deodar, Cypress, Spruce ,Silver fur
	(v) Alpine and tundra forests • Tidal forests • Himalayan vegetation • Rain forests of South India • Thar Deserts	• Sunderban (Ganga Bhrabputra delta) • Western Himalayas and eastern Himalayas • Kerala, Andaman & Nicobar Islands, Arunachal Pradesh, wet Karnataka plateau • Rajasthan and Gujarat region	Above 3600 m altitude	Silver fir, Pine, Juniper, Birch, Alpine grasses, Lichens, Mosses • Sundari • Chir pine, Oak, Maple, • Coconut, Sandal, Teak, Sisoo, • Cacti, Reunjha, Khejra, Kanju, Oak
	2. Grasslands	Dry regions of western parts of the country	All the altitudes and latitudes	Sedges, legumes and plants of Sunflower family. large number of herbivores and insects, , birds etc.
	3. Deserts (i) Thar deserts (ii) Rann of Kutch	Punjab, Haryana, Rajasthan, Gujarat Four types – hills, plains with hills, marshes and plains with sand dunes	Vast saline flats, highly sandy dunes, very high heat and light intensity , Does not support vegetation	Bajra, Millets, wheat, barley, maize, jowar, gower, mehendi, hak, isabgole, gugal Asiatic lion, wild ass, scaly ant eater, desert fox, indain gazzel, great Indian bustard, crane, Pearl oyster, sea turtles, kingfisher, cranes, ibis, herons
	4. Mountains — The Himalayas	In India, it extends from the Indus trench below Nangaparbat in the west to Yarlungtsangpo-Brahmputra George below Namchebarwa peak in east. spread partially or completely over 12 states from J& K ,HP, UK, Sikkim, W B, and 7 North East States .	Covered 16.6% land area in India Geographically divided into the Eastern Himalayas, Central Himalayas, Western Himalayas and N.W Himalayas	Orchids, *Accasia, Albizzia, Delbergia,* species (timber) and many legume, drought and cold resistant varieties of plants, Pangolins, elephants macaque, languor civet.
	5. Ghats • Western Ghats or Sahyadri • Eastern Ghats	From Tapti river in north to Kanyakumari covering 1, 40,000 sq km parallel to west coast of peninsular India. (Gujarat, Maharashtra, Goa, Karnataka, TN, Kerala) North south-west strike in Indian peninsula covering an area of about 75000 sq. km north south-west strike in Indian peninsula covering an area of about 75000 sq. km Odisa, Andhra Pradesh and Tamilnadu. Great rivers Mahanadi, Godavari and Krishna cut across them.	The rainfall may vary from 100 to 500 cm. red or black soil and rich in nutrients. 60 to 160 cm rainfall	3500 species of flowering plants have been recorded from Western Ghats of which nearly1500 are endemic species, 209 species of fresh water fishes Vegetation ranges from evergreen trees to that of dry savannas.
	Aquatic			
	1. Fresh water ecosystem Lakes, flood ponds, reservoirs and rivers	The total freshwater area of India is about 7.6 million hectare. • Lake*s* are naturally formed deep water bodies e.g. Sultanpur lake, Batkal lake (Haryana). • Flood points are the places that undergo periodic flooding as a river channel overflows with flood water. • Reservoir is manmade areas holding water irrigation and human use. • Reservoirs formed by dams used for irrigation. • Rivers are the flowing water bodies. • Ex Yamuna, Ganga Tapti, Krishna, Kaveri and Narmada etc.		
	2. **Marine ecosystem**	Coastline about 8000 km stretching along nine states and two island chains. Three gulfs - one on the east coast that is gulf of Mannar and two on the west coast i.e. Gulf of Kutchch and Gulf of Khambhat.		Nearly 14 species of sea grasses and 120 species of sea weeds are found along the coast. Corals almost all the invertebrate and vertebrate groups, molluscs, crustaceans and coelenterates, sea crows, whales and dolphins

- Threatened ecosystem includes estuaries, mangrove and islands.
- An estuary is a place where a river or a stream opens into the sea. It represents an ecotone between fresh water and marine ecosystem and shows a variation of salinity due to mixing of sea water
- Deltas are triangular areas bordering the river valley towards the mouth. They are associated with the land projecting into the sea in the form of protuberances.
- Estuaries are richer in nutrients; highly productive and support abundant fauna. phytoplanktons (diatoms, dinoflagellates, green algae, blue-green algae).
- Mangroves represent a characteristic littoral (near the sea shore) forest ecosystem.
- These forests grow in sheltered low lying coasts, estuaries, tidal creeks backwaters (Current less, coastal waters held back on land), marshes and lagoons of tropical and sub tropical regions.
- They are distributed over the east and west coast and island of Andaman and Nicobar.
- Islands are land masses surrounded by sea water from all sides They may be far away from the continent (oceanic island)or may be very close to it (continental island).
- Andaman and Nicobar Islands in Bay of Bengal and Lakshadweep in Arabian Sea are the example of islands in India.
- Ecotone is a zone of junction between two or more diverse ecosystems e.g. grass land, estuary, river bank and the mangrove forests. Mangrove forests represent an ecotone between marine and terrestrial ecosystem.
- Destruction and loss of any of the natural ecosystem will result in ecological imbalance and the human being himself will become an endangered species.
- Protection can be done by reducing human needs and minimize their interference in natural environment

Check Yourself

1. Natural ecosystem is always depends on:
a. UV radiation
b. Light energy
c. Solar energy
d. Cosmic rays
2. Grassland of Africa is known as:
   a. Steppes
   b. Savanna
   c. Pampas
   d. Prairies
3. Study of fresh water is termed as:
   a. Hydrology
   b. Desalinization
   c. Oenology
   d. Limnology
4. River mouth coastal ways, tidal marshes lagoons are example of:
   a. Deltas
   b. Mangrove
   c. Basins
   d. Estuary
5. An area which is triangular in shape, bordering the river valley towards the mouth is :
   a. Deltas
   b. Basins
   c. Estuary
   d. Lagoon

Ans: 1. c 2.b 3.d 4.d 5.a

Stretch Yourself

1. Give examples of a natural ecosystem
2. Define natural ecosystem and its characteristics.
3. Name some threatened ecosystem.
4. Define the term ecotone.
5. What is estuary?

Test Yourself

1. Discuss about natural ecosystem and its characteristics.
2. Describe flora and fauna of alpine and arctic tundra.
3. Describe the adaptive characteristic of plants of desert area.
4. Mention characteristics of temperate deciduous forests
5. Give climatic conditions of Himalayan vegetation.
6. How does natural ecosystem protect? Suggest any three ways.