An ecosystem consists of all the living and non-living things in a specific natural setting. Plants, animals, insects, microorganisms, rocks, soil, water and sunlight are major components of many ecosystems. All types of ecosystems fall into one of two categories: terrestrial or aquatic. Terrestrial ecosystems are land-based, while aquatic are water-based. The major types of ecosystems are forests, grasslands, deserts, tundra, freshwater and marine. The word “biome” may also be used to describe terrestrial ecosystems which extend across a large geographic area, such as tundra. Keep in mind, however, that within any ecosystem, specific features vary widely – for instance, an oceanic ecosystem in the Caribbean Sea will contain vastly different species than an oceanic ecosystem in the Gulf of Alaska.

# ###**What is an Ecosystem?**

An ecosystem, a term very often used in biology, is a community of plants and animals interacting with each other in a given area, and also with their non-living environments. The non-living environments include weather, [earth](https://www.conserve-energy-future.com/What-is-earth-day-and-earth-day-activities.php), sun, soil, [climate](https://www.conserve-energy-future.com/ClimateChangeEffects.php) and atmosphere. The ecosystem relates to the way that all these different organisms live in close proximity to each other and how they interact with each other. For instance, in an ecosystem where there are both rabbits and foxes, these two creatures are in a relationship where the fox eats the rabbit in order to survive. This relationship has a knock on effect with the other creatures and plants that live in the same or similar areas. For instance, the more rabbits that foxes eat, the more the plants may start to thrive because there are fewer rabbits to eat them.

According to Wikipedia,

*“An ecosystem is a community of living organisms in conjunction with the nonliving components of their environment (things like air, water and mineral soil), interacting as a system. These biotic and abiotic components are regarded as linked together through nutrient cycles and energy flows. As ecosystems are defined by the network of interactions among organisms, and between organisms and their environment, they can be of any size but usually encompass specific, limited spaces (although some scientists say that the entire planet is an ecosystem).”*

Ecosystems can be huge, with many hundreds of different [animals and plants](https://www.conserve-energy-future.com/what-are-flora-and-fauna.php) all living in a delicate balance, or they could be relatively small. In particularly harsh places in the world, particularly the North and South Poles, the ecosystems are relatively simple because there are only a few types of creatures that can withstand the freezing temperatures and harsh living conditions. Some creatures can be found in multiple different ecosystems all over the world in different relationships with other or similar creatures. Ecosystems also consist of creatures that mutually benefit from each other. For instance, a popular example is that of the clown fish and the anemone – the clown fish cleans the anemone and keeps it safe from parasites as the anemone stings bigger predators that would otherwise eat clown fish.

Earth as an ecosystem stands out in the all of the universe. There’s no place that we know about that can support life as we know it, not even our sister planet, Mars, where we might set up housekeeping someday, but at great effort and trouble we have to recreate the things we take for granted here.  
– Sylvia Earle

An ecosystem can be destroyed by a stranger. The stranger could be rise in temperature or rise in sea level or climate change. The stranger can affect the natural balance and can harm or destroy the ecosystem. Its a bit unfortunate but ecosystems have been destroyed and vanished by man-made activities like [deforestation](https://www.conserve-energy-future.com/various-deforestation-facts.php), [urbanization](https://www.conserve-energy-future.com/causes-and-effects-of-urban-sprawl.php) and natural activities like floods, storms, fires or volcanic eruptions.

**Ecosystem Structure**

At a basic functional level, ecosystem generally contains primary producers (plants) capable of harvesting energy from the sun through the process called photosynthesis. This energy then flows through the food chain. Next come **consumers**. Consumers could be **primary consumers** (herbivores) or **secondary consumers** (carnivores). These consumers feed on the captured energy. Decomposers work at the bottom of the food chain. Dead tissues and waste products are produced at all levels. Scavengers, detritivores and decomposers not only feed on this energy but also break organic matter back into its organic constituents. It is the microbes that finish the job of decomposition and produce organic constituents that can again be used by producers.

Energy that flows through the food chain i.e. from producers to consumers to decomposers is always inefficient. That means less energy is available at secondary consumers level than at primary producers level. Its not surprising but amount of energy produced from place to place varies a lot due to amount of [solar radiation](https://www.conserve-energy-future.com/pros-and-cons-of-solar-energy.php) and the availability of nutrients and water.

**Types of Ecosystem**

There are very many types of ecosystems out there, but the three major classes of ecosystems, sometimes referred to as ‘biomes’, which are relatively contained, are the following:

* Freshwater Ecosystems
* Terrestrial Ecosystems
* Ocean Ecosystems

### ###**Terrestrial Ecosystems**

Terrestrial ecosystems are many because there are so many different sorts of places on [Earth](https://www.conserve-energy-future.com/earth-day-facts-and-significance.php). Some of the most common terrestrial ecosystems that are found are the following:

* **Rainforests** – [Rainforests](https://www.conserve-energy-future.com/Importance-layers-and-types-of-rainforests.php) usually have extremely dense ecosystems because there are so many different types of animals all living in a very small area.
* **Tundra** – As mentioned above, [tundra](https://www.conserve-energy-future.com/various-tundra-biome-facts.php) usually have relatively simple ecosystems because of the limited amount of life that can be supported in these harsh conditions.
* **Deserts** – Quite the opposite of [tundra](https://www.conserve-energy-future.com/tundra-climate.php) in many ways, but still harsh, more animals live in the extreme heat than live in the extreme cold of Antarctica, for instance.
* **Savannas** – These differ from deserts because of the amount of rain that they get each year. Whereas deserts get only a tiny amount of precipitation every tea, savannas tend to be a bit wetter which is better for supporting more life.
* **Forests** – There are many different types of forests all over the world including deciduous forests and coniferous forests. These can support a lot of life and can have very complex ecosystems.
* **Grasslands** – Grasslands support a wide variety of life and can have very complex and involved ecosystems.

Since there are so many different types of terrestrial ecosystems, it can be difficult to make generalizations that cover them all.

Because terrestrial ecosystems are so diverse, it is difficult to make generalizations about them. However, a few things are true almost all of the time. For instance, most contain herbivores that eat plants (that get their sustenance from the sun and the [soil](https://www.conserve-energy-future.com/causes-and-effects-of-soil-pollution.php)) and all have carnivores that eat herbivores and other carnivores. Some places, such the poles, contain mainly carnivores because not plant life grows. A lot of animals and plants that grow and live in terrestrial ecosystems also interact with freshwater and sometimes even ocean ecosystems.

**Forest Ecosystems**

Forest ecosystems are classified according to their climate type as tropical, temperate or boreal. In the tropics, rainforest ecosystems contain more diverse flora and fauna than ecosystems in any other region on earth. In these warm, moisture-laden environments, trees grow tall and foliage is lush and dense, with species inhabiting the forest floor all the way up to the canopy. In temperate zones, forest ecosystems may be deciduous, coniferous or oftentimes a mixture of both, in which some trees shed their leaves each fall, while others remain evergreen year-round. In the far north, just south of the Arctic, boreal forests – also known as taiga – feature abundant coniferous trees.

**Grassland Ecosystems**

Different types of grassland ecosystems can be found in prairies, savannas and steppes. Grassland ecosystems are typically found in tropical or temperate regions, although they can exist in colder areas as well, as is the case with the well-known Siberian steppe. Grasslands share the common climactic characteristic of semi-aridity. Trees are sparse or nonexistent, but flowers may be interspersed with the grasses. Grasslands provide an ideal environment for grazing animals.

**Desert Ecosystems**

The common defining feature among desert ecosystems is low precipitation, generally less than 25 centimeters, or 10 inches, per year. Not all deserts are hot – desert ecosystems can exist from the tropics to the arctic, but regardless of latitude, deserts are often windy. Some deserts contain sand dunes, while others feature mostly rock. Vegetation is sparse or nonexistent, and any animal species, such as insects, reptiles and birds, must be highly adapted to the dry conditions.

**Tundra Ecosystems**

As with deserts, a harsh environment characterizes ecosystems in the tundra. In the snow-covered, windswept, treeless tundra, the soil may be frozen year-round, a condition known as permafrost. During the brief spring and summer, snows melt, producing shallow ponds which attract migrating waterfowl. Lichens and small flowers may become visible during this time of year. The term “tundra” most commonly denotes polar areas, but at lower latitudes, tundra-like communities known as alpine tundra may be found at high elevations.

**Freshwater Ecosystems**

Freshwater ecosystems can be found in streams, rivers, springs, ponds, lakes, bogs and freshwater swamps. They are subdivided into two classes: those in which the water is nearly stationary, such as ponds, and those in which the water flows, such as creeks. Freshwater ecosystems are home to more than just fish: algae, plankton, insects, amphibians and underwater plants also inhabit them.

###These can then be broken up into smaller ecosystems. For instance, in the freshwater ecosystems we find:

* **Pond Ecosystems** – These are usually relatively small and contained. Most of the time they include various types of plants, amphibians and insects. Sometimes they include fish, but as these cannot move around as easily as amphibians and insects, it is less likely, and most of the time fish are artificially introduced to these [environments](https://www.conserve-energy-future.com/top-25-environmental-concerns.php) by humans.
* **River Ecosystems** – Because rivers always link to the sea, they are more likely to contain fish alongside the usual plants, amphibians and insects.

These sorts of ecosystems can also include birds because birds often hunt in and around water for small fish or insects.

As is clear from the title, freshwater ecosystems are those that are contained to freshwater environments. This includes, but is not limited to, ponds, rivers and other waterways that are not the sea (which is, of course, saltwater and cannot support freshwater creatures for very long). Freshwater ecosystems are actually the smallest of the three major classes of ecosystems, accounting for just 1.8% of the total of the Earth’s surface. The ecosystems of freshwater systems include relatively small fish (bigger fish are usually found in the sea), amphibians (such as frogs, toads and newts), insects of various sorts and, of course, plants. The absolutely smallest living part of the food web of these sorts of ecosystems is plankton, a small organism that is often eaten by fish and other small creatures.

**Marine Ecosystems**

Marine ecosystems differ from freshwater ecosystems in that they contain saltwater, which usually supports different types of species than does freshwater. Marine ecosystems are the most abundant types of ecosystems in the word. They encompass not only the ocean floor and surface but also tidal zones, estuaries, salt marshes and saltwater swamps, mangroves and coral reefs.

###Ocean ecosystems are relatively contained, although they, like freshwater ecosystems, also include certain birds that hunt for fish and insects close to the ocean’s surface. There are different sorts of ocean ecosystems:

* **Shallow water** – Some tiny fish and coral only live in the shallow waters close to land.
* **Deep water** – Big and even gigantic creatures can live deep in the waters of the oceans. Some of the strangest creatures in the world live right at the bottom of the sea.
* **Warm water** – Warmer waters, such as those of the Pacific Ocean, contain some of the most impressive and intricate ecosystems in the world.
* **Cold water** – Less diverse, cold waters still support relatively complex ecosystems. Plankton usually form the base of the food chain, following by small fish that are either eaten by bigger fish or by other creatures such as seals or penguins.

[Ocean](https://www.conserve-energy-future.com/causes-and-effects-of-ocean-pollution.php) ecosystems are amongst some of the most interesting in the world, especially in warm waters such as those of the Pacific Ocean. This is not least because around 75% of the Earth is covered by the sea, which means that there is lots of space for all sorts of different creatures to live and thrive. There are actually three different types of oceanic ecosystems: shallow waters, deep waters and the deep ocean surface. In two of these the very base of the food chain is plankton, just as it is in freshwater ecosystems.

These plankton and other plants that grow in the ocean close to the surface are responsible for 40% of all photosynthesis that occurs on Earth. From this there are herbivorous creatures that eat the plankton, such as shrimp, that are then themselves usually eaten by bigger creatures, particularly fish. Interesting, in the deep ocean, plankton cannot exist because photosynthesis cannot occur since light cannot penetrate that far into the ocean’s depths. Down in the deepest depths of the ocean, therefore, creatures have adapted very strangely and are amongst some of the most fascination and the most terrifying and intriguing living creatures on Earth.

$$$There are essentially two kinds of ecosystems; Aquatic and Terrestrial. Any other sub-ecosystem falls under one of these two headings.  
 **Terrestrial ecosystems**  
Terrestrial ecosystems can be found anywhere apart from heavily saturated places. They are broadly classed into:  
 **The Forest Ecosystems**  
They are the ecosystems in which an abundance of flora, or plants, is seen so they have a big number of organisms which live in relatively small space. Therefore, in forest ecosystems the density of living organisms is quite high. A small change in this ecosystem could affect the whole balance, effectively bringing down the whole ecosystem. You could see a fantastic diversity in the fauna of the ecosystems, too. They are further divided into:

* **Tropical evergreen forest:** These are tropical forests that receive a mean rainfall of 80 for every 400 inches annually. The forests are characterised by dense vegetation which comprises tall trees at different heights. Each level is shelter to different types of animals.
* **Tropical deciduous forest:** There, shrubs and dense bushes rule along with a broad selection of trees. The type of forest is found in quite a few parts of the world while a large variety of fauna and flora are found there.
* **Temperate evergreen forest:** Those have quite a few number of trees as mosses and ferns make up for them. Trees have developed spiked leaves in order to minimize transpiration.
* **Temperate deciduous forest:** The forest is located in the moist temperate places that have sufficient rainfall. Summers and winters are clearly defined and the trees shed the leaves during the winter months.
* **Taiga:** Situated just before the arctic regions, the taiga is defined by evergreen conifers. As the temperature is below zero for almost half a year, the remainder of the months, it buzzes with migratory birds and insects.

**The Desert Ecosystem**  
Desert ecosystems are located in regions that receive an annual rainfall less than 25. They occupy about 17 percent of all the land on our planet. Due to the extremely high temperature, low water availability and intense sunlight, fauna and flora are scarce and poorly developed. The vegetation is mainly shrubs, bushes, few grasses and rare trees. The stems and leaves of the plants are modified in order to conserve water as much as possible. The best known desert ones are the succulents such as the spiny leaved cacti. The animal organisms include insects, birds, camels, reptiles all of which are adapted to the desert (xeric) conditions.   
  
**The Grassland Ecosystem**  
Grasslands are located in both the tropical and temperate regions of the world though the ecosystems vary slightly. The area mainly comprises grasses with a little number of trees and shrubs. The main vegetation includes grasses, plants and legumes that belong to the composite family. A lot of grazing animals, insectivores and herbivores inhabit the grasslands. The two main kinds of grasslands ecosystems are:

1. **Savanna:** The tropical grasslands are dry seasonally and have few individual trees. They support a large number of predators and grazers.
2. **Prairies:** It is temperate grassland, completely devoid of large shrubs and trees. Prairies could be categorized as mixed grass, tall grass and short grass prairies.

**The Mountain Ecosystem**  
Mountain land provides a scattered and diverse array of habitats where a large number of animals and plants can be found. At the higher altitudes, the harsh environmental conditions normally prevail, and only the treeless alpine vegetation can survive. The animals that live there have thick fur coats for prevention from cold and hibernation in the winter months. Lower slopes are commonly covered with coniferous forests.  
  
**Aquatic Ecosystems**  
The aquatic ecosystem is the ecosystem found in a body of water. It encompasses aquatic flora, fauna and water properties, as well. There are two main types of aquatic ecosystem - Marine and Freshwater.  
  
**The Marine Ecosystem**  
Marine ecosystems are the biggest ecosystems, which cover around 71% of Earth's surface and contain 97% of out planet's water. Water in Marine ecosystems features in high amounts minerals and salts dissolved in them. The different divisions of the marine ecosystem are:

* Oceanic: A relatively shallow part of oceans which lies on the continental shelf.
* Profundal: deep or Bottom water.
* Benthic Bottom substrates.
* Inter-tidal: The place between low and high tides.
* Estuaries
* Coral reefs
* Salt marshes
* Hydrothermal vents where chemosynthetic bacteria make up the food base.

Many kinds of organisms live in marine ecosystems: the brown algae, corals, cephalopods, echinoderms, dinoflagellates and sharks.   
  
**The Freshwater Ecosystem**  
Contrary to the Marine ecosystems, the freshwater ecosystem covers only 0.8% of Earth's surface and contains 0.009% of the total water. Three basic kinds of freshwater ecosystems exist:

* Lentic: Slow-moving or till water like pools, lakes or ponds.
* Lotic: Fast-moving water such as streams and rivers.
* Wetlands: Places in which the soil is inundated or saturated for some lenghty period of time.

The ecosystems are habitats to reptiles, amphibians and around 41% of the world’s fish species. The faster moving turbulent waters typically contain a greater concentrations of dissolved oxygen, supporting greater biodiversity than slow moving waters in pools.

%%%Effects of Airports On Eco-System

The significant role of airports on regional economy has been prominently recognised by many researches; airports bring significant social benefits and in many cases they are thought to be the single largest generator of economic activity in the regions they serve. However, transport infrastructures like airports have considerable effect on city’s urban development and have negative impacts on the environment. Many reports show that the contribution of airports to environmental disturbance at a local and global scale is significant. Key environmental impacts may result from airport operations, airline operations, airport access or various construction projects in the airport landside.

Within the global context, airports have significant impact on the global environment in terms of climate change. At a local level, even though noise seems to be the main concern over the last 20 years, air emissions, resources (energy and water) availability, waste and waste water management, ecosystems and land use planning constitute issues that are directly linked to local communities’ tolerance.

Worldwide international aviation is considered one of the most growing sources of greenhouse gas emissions. Even though aircraft emissions are not included in Kyoto protocol, emissions that are directly controlled by airport operators are ground-based and therefore are subject to national inventories and targets.

The most important measures that airports apply in order to reduce their carbon footprint or to manage emissions that are under their direct control include improvements in energy efficiency and conservation, ground fleet conversions, low emission power generation plants on site or renewable energy supplies. In some cases geothermal, hydropower, solar or wind power is used to cover a significant proportion of energy needs. In other cases many airports focus their efforts on achieving carbon neutral operations by offsetting carbon emissions that cannot eliminate. It is worth mentioning that there are examples of airports that become carbon accredited to ensure efficient operations, to reduce costs, to raise airport’s profile and credibility and to secure a license to grow.

Even though many actions have been applied to mitigate climate change impact these seem to focus on reducing carbon emissions only. This is surprisingly considering that global warming results in alteration in the hydrological cycle that could result in changes in the precipitation patterns and run-offs that could affect water availability and demand. And it is a fact that many areas in Europe already have to deal with severe water stress. Consequently, water availability could become a major barrier for growth for airports located in hot destinations that are affected by climate changes.

Water use is generally considered as a constraining growth factor for many airports. The most representative example is the case of Heathrow airport, in UK. A detailed analysis of the applied environmental strategies showed that, in most of the cases, the applied practices to reduce water use depend on the location of the airport. In order to increase water efficiency airports may install various leak detection systems, install water reduction devices and implement water recycling operations to reduce the demand of potable water.

In addition to climate change impact airports present significant consequences on the surrounding area as they are a major source of noise and waste. Undoubtedly, if you have stayed for a short-time near an airport you should be annoyed by the noise coming from aircrafts take-off and landing activities. Even though certain measures are implemented by large airports to reduce noise levels, like noise monitoring systems, operating restrictions and limits, air traffic management, anti-noise barriers, home insulation etc. there are many airports around the world thatthreaten peoples’ health.

In addition to noise the degradation of local air quality is another issue to consider. The most significant sources of air pollution is generally linked to aircrafts, airside and landside vehicles, ground support equipment, fuel storage, various point source, engine testing, fire training and road traffic. Key pollutants of concern include oxides of nitrogen, carbon monoxide, hydrocarbons, particulate matter, sulfur oxide and carbon dioxide. The most common applied measures to control air pollution include air quality monitoring systems, air traffic management, promotion of green transport access nodes etc.

Waste water and effluents is another issue that needs proper management to avoid polluting the surroundings of an airport and posing harm to employees, customers, local communities and the environment. Airport water run-offs are considered a major source of pollution as they are characterised by high level of chemicals and toxic substances, resulting from aircraft and airfield de-icing and anti-icing, fuel spillages, firefighting foam, chemicals and oils from aircraft and vehicle maintenance, [detergents](https://greencleanguide.com/2015/10/21/insight-into-the-world-of-detergents/) used in aircraft and vehicle cleaning etc. The most common applied measures include wastewater and sewage plants, drainage systems, surface and ground water quality monitoring, sampling at discharge points, oil, hydrocarbon and grease separator systems, use of biologically degraded de-icing and anti-icing agents etc.

In addition to waste water and air emissions airport activities involve the production of significant amounts of solid waste that needs to be managed. The waste generation mainly includes solid urban waste, non-hazardous waste and special hazardous waste from terminal, airfield operations, maintenance activities, and aircraft catering. Airports often carry out various waste initiatives to reduce waste or to separate wasteat source. In addition, collection and safe disposal of hazardous waste is taking place in accordance to the relevant regulations.