

We can **increase the removal of carbon dioxide from the atmosphere** by growing more forests. This can be done by:

- establishing forests on land that has not been a forest for a very long time (several decades ago) - this is called afforestation;
- re-establishing forests in an area that was recently a forest (around a decade ago) - this is called reforestation;
- planting suitable trees in degraded forest areas to restore forest structure.

These activities will **increase carbon sinks** and promote the **establishment of valuable forest ecosystem services**.

We can **reduce the amount of carbon dioxide released into the atmosphere** by reducing the areas of forest removed and trees cut down. This can be done by:

- preventing the conversion of forests to another land use type (e.g. proper land use planning of forest areas to minimise forest clearance instead of completely clearing the forest to establish cash crop plantations or pasture land);
- applying less destructive timber harvesting techniques (e.g. select only suitable trees to harvest and ensure minimum environmental disturbance when putting in logging roads and tracks);
- practising farming systems that minimise the removal of trees (e.g. apply agroforestry farming systems);
- conserving forests that are under threat of being removed.

These activities will **protect carbon pools and sinks** and **maintain forest ecosystem services**.

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Forests & Climate Change



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The increase in greenhouse gases in the atmosphere is resulting in rising global atmospheric temperatures. This is leading to climate change. Carbon dioxide is the main greenhouse gas emitted through human activities, especially from the use of fossil fuels such as petrol, oil, diesel and coal.

Forests mitigate climate change by **removing carbon dioxide from the atmosphere**. Trees take in carbon dioxide to make their food and build new plant cells.

The process of removing carbon dioxide from the atmosphere and accumulating it in a carbon pool (like a forest) is called **carbon sequestration**.

A forest is actively taking in carbon dioxide when it is growing. During this process, more carbon is stored in the forest than is released into the atmosphere. This makes a growing forest a **carbon sink**.

A forest is also referred to as a **carbon pool**. A carbon pool has the capacity to store and release carbon. In a forest, carbon is measured from five main carbon pools as: i) above-ground biomass (e.g. trees and plants), ii) below-ground biomass (roots), iii) dead wood, iv) leaf-litter, and v) soil organic matter. The ocean and atmosphere are also major carbon pools.

Forests have other functions that are just as important as sequestering and storing carbon. They provide valuable **ecosystem services** such as:

- regulating the local climate
- mitigating floods and reducing soil erosion
- purifying water
- supporting the nutrient cycle
- contributing to soil formation
- harbouring different kinds of plants, animals and birds
- providing forest communities with food, fresh water, wood, fibre, medicine, and shelter.

These services reduce the vulnerability of local communities to the impacts of climate change.

Forests also host plants, animals and sites that are of cultural and spiritual significance to local forest communities.

Forests are a vast carbon pool. When trees and forest vegetation die because of natural disasters and diseases or are cut down or burnt, large quantities of carbon are released into the atmosphere as carbon dioxide. This makes forests a potentially large **carbon source**.

Almost 17.4% of total anthropogenic (man-made) greenhouse gas emissions are attributed to the removal of forests. The main driver for forest removal is the demand for agricultural land.

Removal of forests also results in the **loss of forest ecosystems services**. The loss of forests can lead to the loss of traditional skills and cultural values relating to trees and forests.