

Climate change as a result of human activity is a reality. Forests can be an important and attractive part of the solution

② Some background information

We are experiencing climate change because human activities continue to release greenhouse gases such as carbon dioxide into the atmosphere. Forests are part of the cause of climate change because globally deforestation contributes to nearly 20% of carbon dioxide emissions. However, forests can be an important part of the solution if we can reverse deforestation and plant new forests to absorb carbon dioxide from the atmosphere.

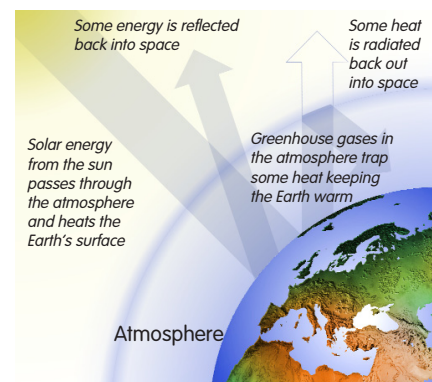
Human impact

Earth's climate has been relatively stable since the last glaciation, which ended 10,000 years ago

However it is generally agreed among scientists that we are now experiencing climate change as a result of human activities that have taken place over the last century or so

Since the industrial revolution, burning of fossil fuels and large-scale deforestation have released greenhouse gases such as carbon dioxide and methane into the atmosphere

These and other human activities mean that atmospheric concentrations of carbon dioxide have risen by 40% over pre-industrial levels



Greenhouse gases occur naturally in the atmosphere. Indeed the Earth would be uninhabitable without them. The problem is that levels of greenhouse gases have increased due to human activity since the 1850s. Greenhouse gases in the Earth's atmosphere warm the Earth by preventing heat escaping from the atmosphere back into space.

Trees are a carbon store

While they are growing, trees absorb carbon dioxide from the atmosphere through photosynthesis and store it as carbon in the form of wood.

Facts and Figures

- Carbon dioxide is the most important greenhouse gas in terms of human activity. In the UK it contributed to over 85% of total greenhouse gas emissions in 2008.
- More carbon is stored in global forest ecosystems than is contained in all of the world's remaining oil stocks, or in the atmosphere
- Deforestation alone currently accounts for 18% of global carbon dioxide emissions. This is greater than the whole transport sector
- Soil contains the largest carbon store in the UK with woodland soils storing about 640 million tonnes of carbon. This is in comparison to the 150 million tonnes stored in forest biomass.

Trees store carbon through photosynthesis



Plants use carbon dioxide and water as raw materials during photosynthesis to produce sugars. These sugars provide the energy required to for the production of cellulose, or lignin in the case of woody plants – locking up carbon. Oxygen is produced as a by-product. Some of the carbon dioxide is returned to the atmosphere through respiration. The remaining carbon is stored in leaf, root, seed, wood and branch biomass.

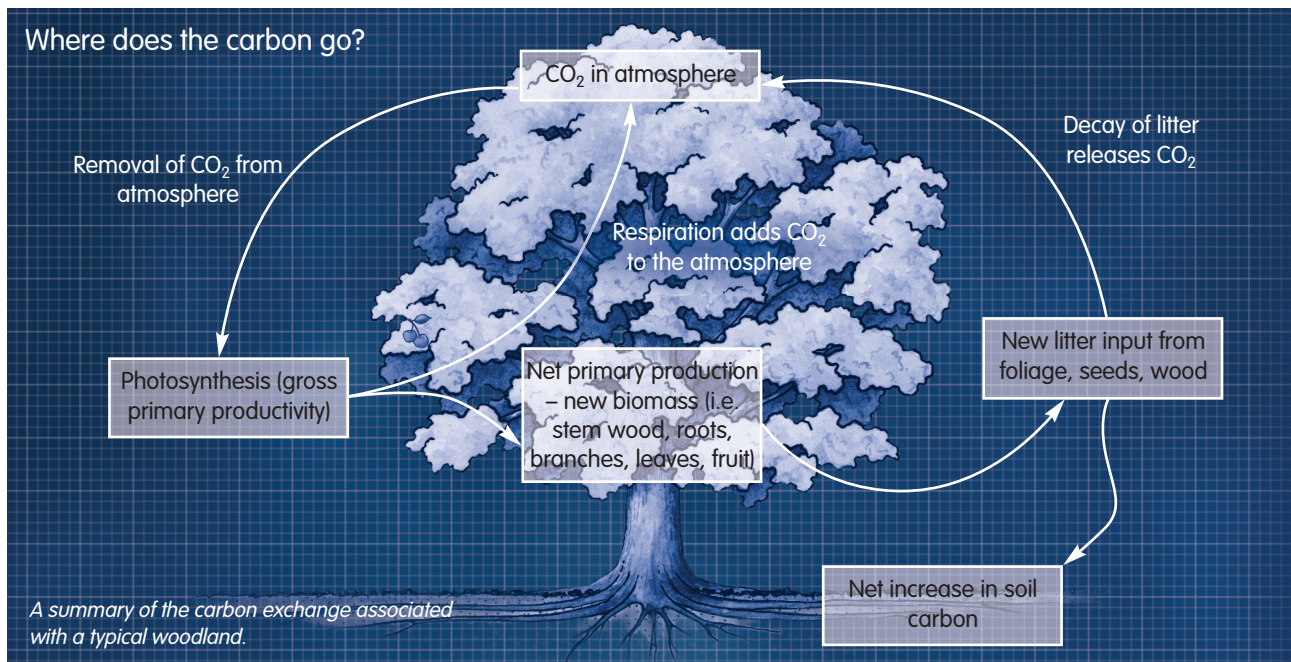
What is the difference between carbon and carbon dioxide?

- Carbon is a chemical element with the symbol C. It is the fourth most abundant element in the universe by mass after hydrogen, helium and oxygen.
- Carbon dioxide is a gas at standard temperature and pressure.
- One tonne of carbon is equivalent to 3.7 tonnes of carbon dioxide.
- One tonne of (oven-dried) wood contains approximately half a tonne of carbon. This is the equivalent of 1.85 tonnes of carbon dioxide.

At the beginning of the 20th Century, woodland covered only 5% of the UK's land surface. By 2009, the area covered had increased to 12% (9% in England, 17% in Scotland, 14% in Wales and 7% in

Northern Ireland). Although this percentage is still small in global terms, the forests and woodlands in the UK have an important role to play, and the work of the Forestry Commission is vital.

Where does the carbon go?



Summary

- Earth's climate is changing as a result of human activity
- Trees and forests and their products can be part of the solution to combating climate change if they are well managed, both on a global and a local scale