



2015  
International  
Year of Soils

# SOILS HELP TO COMBAT AND ADAPT TO CLIMATE CHANGE

CO<sub>2</sub>

Healthy soils provide the largest store of terrestrial carbon.



## Poorly managed soils

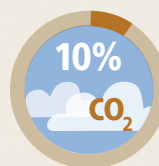
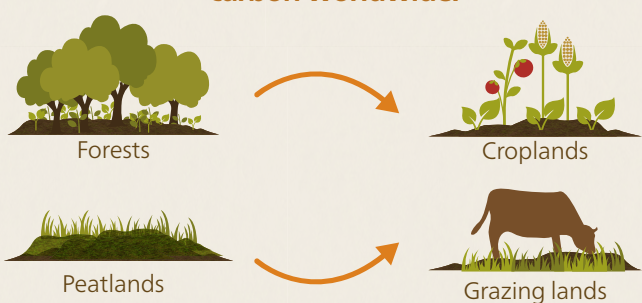
If soils are managed poorly or cultivated through unsustainable agricultural practices, soil carbon can be released into the atmosphere in the form of carbon dioxide (CO<sub>2</sub>), which can contribute to climate change.



Climate change represents a serious threat to global food security.



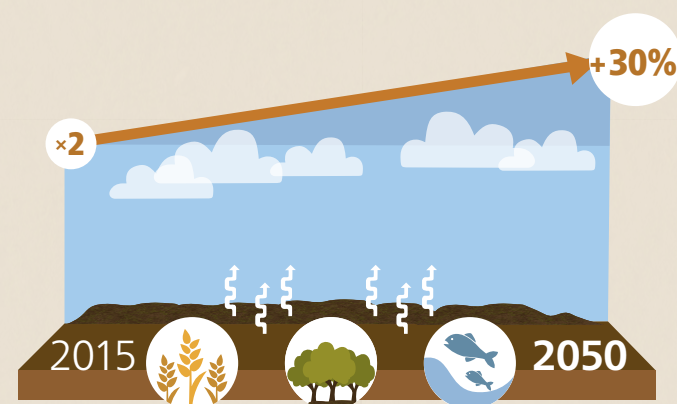
The steady conversion of grassland and forestland to cropland and grazing lands has resulted in **historic losses of soil carbon worldwide.**



Land-use conversions and drainage of organic soils for cultivation are responsible for about **10% of all greenhouse gas emissions.**



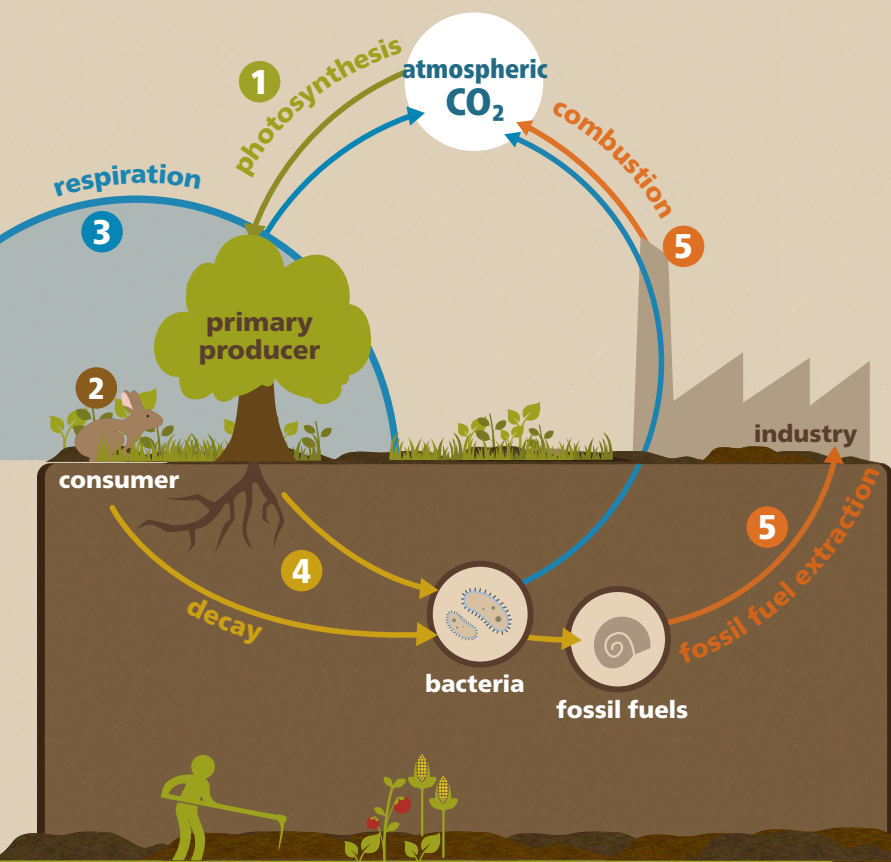
Greenhouse gas emissions from agriculture, forestry and fisheries **have nearly doubled over the past 50 years.**



Without greater efforts to reduce them, **they could increase an additional 30% by 2050.**

## Soils and the Carbon Cycle

The carbon cycle is the exchange of carbon (in various forms, e.g., carbon dioxide) between the atmosphere, ocean, terrestrial biosphere and geological deposits.



- Plants use CO<sub>2</sub> from the atmosphere, water from the soil and sunlight to make their own food and grow in a process called **photosynthesis**. The carbon they absorb from the air becomes part of the plant.
- Animals** that feed on the plants pass the carbon compounds along the food chain.
- Most of the carbon the animals consume is converted into CO<sub>2</sub> as they breathe (**respiration**), and is released back into the atmosphere.
- When the animals and plants die, the dead organisms are eaten by decomposers in the soil (**bacteria and fungi**) and the carbon in their bodies is again returned to the atmosphere as CO<sub>2</sub>.
- In some cases, the dead plants and animals are buried and turn into **fossil fuels**, such as coal and oil, over millions of years. Humans burn fossil fuels to create energy, which sends most of the carbon back into the atmosphere in the form of CO<sub>2</sub>.

## Sustainably managed soils

When managed sustainably soils can play an important role in climate change mitigation through carbon sequestration (C) and by decreasing greenhouse gas emissions in the atmosphere.



By restoring degraded soils and adopting soil conservation practices...



...there is major potential to **decrease the emission of greenhouse gases from agriculture, enhance carbon sequestration and build resilience to climate change.**

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