

# How land use affects the carbon cycle

Fossil fuel use is a major contributor to climate change, but a new report has shone the spotlight on another major emitter: the way land is being used and abused. A special report by the Intergovernmental Panel on Climate Change (IPCC) highlighted how humans' use of the land for activities such as agriculture and forestry accounted for about 23% of planet-warming emissions between 2007 and 2016.

## CARBON RESERVOIRS

- Most of the earth's carbon is stored in reservoirs such as rocks, sediments and the ocean.
- But there are also carbon sources and sinks on land.
- With human use directly affecting more than 70% of the global ice-free land surface, the way land is being used for activities such as agriculture impacts the carbon cycle. This is the focus of the new IPCC report.

### Rocks and sediments

Erosion releases carbon back into the atmosphere very slowly while sudden volcanic activities release it quickly and in huge amounts.

### Living organisms

Rearing of livestock such as cows contributes to the release of methane, a potent planet-warming gas.

## CARBON CYCLE

- The way carbon flows from one reservoir to another is called the carbon cycle.
- Because of this, changes in one reservoir would affect the other. Land use changes and fossil fuel

use, for example, are putting more carbon into the air, throwing the carbon cycle out of whack. With growing concentrations of carbon-containing gases such as carbon dioxide and methane in the air, heat is trapped on earth.

- This causes climate change and contributes to the increase in extreme weather events.

### Atmosphere

Burning of fossil fuels – such as coal and oil – and emissions from factories, power plants and motor vehicles release most of the carbon into the atmosphere as carbon dioxide.

### Ocean

- The ocean stores a huge amount of carbon. A two-way carbon exchange occurs constantly between the ocean's surface waters and the atmosphere.
- Although the ocean absorbs much of the carbon dioxide that is released from human activities, this extra carbon dioxide makes the ocean more acidic, putting marine life in danger.

### Forests

- Forests take in carbon dioxide and sunlight in a process called photosynthesis, releasing oxygen as a by-product.
- By doing so, they function as carbon "banks", storing the carbon in the soil, roots, leaves and vegetation.
- But when they are cleared for pasture and plantations, these carbon "banks" are bankrupted, as the new uses of land can store less carbon.
- Forest fires and slash-and-burn activities compound the problem. Cleared lands are often converted into croplands which store less carbon.



A land-clearing area near protected forest in Tangse, Aceh province.