

## Why planting trees doesn't necessarily help fight climate change

01 November 2021

**Based on an obvious fact – that trees capture carbon dioxide in order to grow – more and more massive reforestation initiatives are flourishing as a way to limit global warming. But the situation is actually more complex...**

The solution seemed to have been found. Since climate change was identified, the harmful role of greenhouse gases, which are emitted by human activity in particular, and which mechanically contribute to warming the atmosphere, have been at the heart of the debate. Especially the role of the most famous and abundant gas of all, carbon dioxide (CO<sub>2</sub>).

While the commonly accepted goal is now to reduce the amount of CO<sub>2</sub> in the air, any means of capturing it would seem a good idea. And what more natural way than trees, which use this gas extensively in their growth process, making them notorious carbon sinks?

### **Evidence questioned by science**

The following reasoning has therefore become obvious: by planting a tree, we contribute to the fight against global warming. This simple premise has been taken up by many economic and political actors who have committed to reforestation projects to offset some of their greenhouse gas emissions or simply to act in favour of the environment. In 2019, the European Union announced its intention to plant 3 billion trees by 2024.

As the French science magazine *Epsilon* eloquently demonstrated in its August issue, however, the reality is more complex than the linear equation that 'one tree planted = less CO<sub>2</sub> in the atmosphere'. Several scientific studies on reforestation initiatives launched in recent years show that their overall impact on climate change is more mixed than expected.

### **Forests, carbon sinks in danger**

The first hitch comes when we look closely at the carbon sink potential of forests and how the effects of global warming are already limiting this potential. The huge forest fires that have occurred in recent years around the globe have released huge amounts of CO<sub>2</sub>. So much so, says *Epsilon*, that the carbon balance of these vast woodlands has sometimes become deficient – for example, in western North America and Siberia.

"Climate-related risks are not well-considered in reforestation initiatives, whereas they should be a priority," said William Anderegg, a biologist at the University of Utah, quoted by the monthly magazine. "It's possible that climate impacts will drastically decrease the carbon sink capacity of the world's forests, although the models don't yet agree on this."

If the trees planted to cool the atmosphere end up going up in smoke, then the opposite of the intended effect may be achieved.

### **Initiatives can be counterproductive**

Other factors can make reforestation operations counterproductive. *Epsilon* mentions the problem posed by "dark-coloured conifers", which "absorb more solar radiation than the lighter surrounding soil" and whose planting can cause local warming!

"This phenomenon is very prominent in arid and semi-arid regions, where the soil reflects a lot of light, but it happens everywhere and should be seriously evaluated. However, this is not taken into account at all in reforestation initiatives," said Christopher Williams, from Clark University, co-author of a study on the subject.

The problem of choosing which areas should be reforested is therefore acute, but in many cases, reforestation initiatives are developed for their own sake, disregarding the future consequences for the land on which the trees are planted.

A British study mentioned in the *Epsilon* report showed that massive plantations of birch trees in the Scottish moorland have destabilised the microbial flora present in these soils, ultimately releasing more carbon emissions than the trees retain themselves.

Paradoxically, reforestation can therefore be detrimental to the existing ecosystems that it is supposed to revitalise, when it involves, for example, imposing a monoculture of pines or eucalyptus on unsuitable soil.

"Many ecosystems are better off without trees," Diana Davis of the University of California told *Epsilon*. "All these maps of reforestation potential and huge one trillion tree initiatives are based on a misunderstanding of ecology."

So much so that these reforestation actions can sometimes tip over into complete nonsense, requiring collateral deforestation.

"Imposing plantations could displace farmers and lead them to clear parts of native forests," explained Eric Lambin, a geographer at Stanford, again quoted by the scientific magazine. "Our latest studies have also shown abuses in the subsidy systems granted for reforestation, which sometimes lead to the razing of the natural forest for planting."

#### **Can we turn towards a more balanced model of ecosystem restoration?**

Faced with all these pitfalls, a more balanced approach to the issue seems essential.

"We need to stop looking at trees as a universal solution to the vast and complex problem of climate change... even if planting trees feels good," pleaded Caroline Lehmann, a researcher at the University of Edinburgh, in the conclusion of the *Epsilon* report.

As the magazine points out, "other carbon sinks that are too often neglected" could also be developed, such as mangroves, grasslands or peat bogs, which can store considerable quantities of CO<sub>2</sub>.

By taking more account of these alternatives, but also by pursuing reforestation initiatives that have been carefully studied, a positive impact on climate change is achievable.

In view of the meetings on the subject to be held at COP26, a team from the University of Oxford has worked on a more balanced model of preservation and restoration of ecosystems and soils, which could lead, according to *Epsilon*, to "a 0.3 degree Celsius reduction in global temperature by 2085, in the 2 degree Celsius warming scenario".

Source:<https://news.yahoo.com/why-planting-trees-doesnt-necessarily-help-fight-climate-change-155438567.html>