# Forests' long-term potential for carbon offsetting

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As well as cutting our fossil fuel emissions, planting new forests, or managing existing forests or agricultural land more effectively can capitalise on nature's ability to act as a carbon sink. Research published online in the open access journal *Carbon Balance and Management* shows that although planting trees alone is unlikely to solve our climate problems, large-scale plantations could have a significant effect in the longer term.

Rik Leemans and colleagues from Wageningen University, the Netherlands and the Netherlands Environmental Assessment Agency modelled the future effects of carbon plantations. They estimated plantations' long-term physical and social sequestration potential up to the end of the 21st century, and their effectiveness in slowing down the increase in atmospheric CO2.

The projected outcomes differ widely: the authors found a difference of nearly 100% in the sequestration potential up to 2100 between two baseline scenarios. This highlights the effect of future land use uncertainties. Social, economic and institutional barriers preventing carbon plantations in natural vegetation areas decrease the plantation's sink potential by 75% or more. Nevertheless, the forest's potential should not to be underestimated: Even the most conservative assumptions suggest that the cumulative sequestration potential up to 2100 can compensate for 5-7% of energy and industry related CO2 emissions.

However, trees aren't a quick fix, Leemans cautions. "The potential for the coming decades is limited due to the limited amount of available land and the long period needed to compensate for emissions related to the establishment of the plantations. "The net sequestration up to 2020 is limited, given the short-term increased need for agricultural land and the long period needed to compensate for emissions through plantation establishment."

The most effective plantations occur in tropical regions, whereas the effectiveness of high latitude plantations is more questionable. Although plantations have a considerable carbon sink potential, the authors say that these should form part of a broader package of options, including reducing energy CO2 emissions.

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