Using nature’s resources to store carbon

The ability of the Earth’s living systems to store carbon could play a vital role in the mitigation of climate change. A new report suggests that, in coming decades, safeguarding and restoring carbon in ecosystems has the potential to prevent well over 50 gigatonnes (Gt) of carbon entering the atmosphere.

Last year the EU launched its Climate Action and Renewable Energy package¹ to set a target of reducing its overall emissions to at least 20 per cent below 1990 levels by 2020. Both European and global targets could be aided by enhancing nature’s carbon capture and storage capacity, with the additional benefits of promoting biodiversity and soil fertility.

There are three priority ecosystems for carbon conservation and management - forests, peatlands and agriculture. Reducing deforestation rates by 50 per cent by 2050 and maintaining them at this level until 2100 (with deforestation stopping altogether when 50 per cent of the area remains in each country that was originally forested in 2000) would avoid the release of up to 50 Gt of carbon this century. Reducing deforestation in tropical regions would have the biggest impact. Emissions from deforestation are equivalent to about 15 per cent of the total global anthropogenic carbon emissions.

The draining of peatland for agricultural land and other land uses emits up to 0.8 Gt of carbon a year. This is particularly problematic for tropical peat-swamp forests in South-East Asia which are being drained for palm oil and pulpwood production. The carbon value of peatland far outweighs the carbon benefits of the biofuel crops. For example, the combustion of palm oil produced on drained peatland equates to a carbon ‘debt’ which could take centuries of biofuel production to repay.

Agriculture has the potential to make significant gains in carbon storage. If best management practices were adopted, it is estimated that 5.5-6 Gt of CO₂ equivalent could be saved per year by 2030. About 90 per cent of this could be achieved by enhancing carbon sinks and 10 per cent from emission reductions. This could make agriculture almost carbon neutral. These management practices could include crop rotation and agroforestry which combine food production with tree planting.

The report suggests that the management of carbon storage and uptake is achievable if the right policy framework is in place. It suggests we need to change our perception of the natural world from an offset mechanism – where forests are planted to compensate for emissions - to a sector capable of real reductions in emissions. However, there is uncertainty about the amounts of carbon sequestered and the authors note that all stores, except perhaps peat, would eventually reach saturation.

The report suggests that mitigation policy should be guided by the best available science alongside a cost-benefit analysis. The IPCC has concluded that at an appropriate price for carbon (€70 per tonne of CO₂), the agricultural sector could be second to the building sector in 2030 in terms of mitigating climate change. There are other potential benefits, such as improvements to biodiversity, soil fertility and local economies. However, consideration must be given to local populations to ensure that any changes in land use do not further disadvantage groups who are already poor or marginalised.

¹. See http://ec.europa.eu/environment/climat/climate_action.htm


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