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The Guardian

So many ways – big and small – to capture carbon

Readers and heads of environmental organisations respond to a call to rewild on a massive scale

Letters

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George Monbiot (*The natural world can help save us from climate chaos*, 3 April), Greta Thunberg and other signatories (*Letters*, 3 April) are right. Nature can provide effective options to help tackle climate change. Often there is no need for complicated, expensive and unproven technology. As we know from our work in such countries as Bhutan and Costa Rica, some governments are embracing nature-based solutions where natural forests are managed for their key role in storing carbon and regulating water for clean, green hydropower. Policies and investment need to work with local people and focus on linking nature to infrastructure to help avoid catastrophic climate change, protect biodiversity and cut emissions. The real challenge is to align the politics of change to the actions that are needed. While some countries are doing the right thing, in other places (such as Brazil) the politics is going backwards in deeply troubling ways.

The international community needs to act to support local livelihoods and enable communities to be good stewards of the natural world. Our lives depend on it.

Andrew Norton

Director, International Institute for Environment and Development (IIED)

. Readers seeking a wide-ranging introduction to the practicalities and benefits of rewilding formerly intensive agricultural land in the UK will find lots of interest in the book *Wilding*, by Isabella Tree - about a live, 20-year-old project on the Knepp Estate in West Sussex, which can be visited. Especially interesting is the information on the role of glomalin in carbon capture and in soil improvement. A natural glycoprotein, it is produced by mycorrhizal fungi from plant roots and is a key soil component. A Defra assessment of the increased carbon storage capacity on this site, in neutral grassland and broadleaved woodland under rewilding, showed a 51% rise compared with the intensive agricultural management of last century. I was pleased to find that there does seem a way to get a grip on climate change alongside reducing emissions, if we can grasp it. We can all do it in our gardens as well - we don't have to plant trees.

Roy Rhodes

Belmont, Lancashire

. This mobilisation to draw carbon naturally from the atmosphere is long overdue. Sign me up! But is it still too narrow?

Logically, the more people and places that are mobilised, the more carbon we can extract. But how many of us can access the forest, swamp, coastal margin etc of which George Monbiot writes? Very few. This is still for others to do, not me.

Yet here I am in my back garden deliberately burying carbon. I ferment all food waste (no carbon emitted), feed it directly to my soil's ecosystem (more soil carbon biomass), add wood biochar (permanent carbon sink) to house more soil micro-organisms and retain water and nutrients (for more biomass), then mulch with dead vegetation (protection and food for biomass). This is low-tech, and makes lovely worm-dug growing soil.

My point is that we can trap carbon naturally in many ways, some of which fit local resources and local needs like food and sanitation. These lend themselves to community efforts, in every neighbourhood everywhere. Summed together across a country, they'd be as significant as George's big-ticket items. We can, and should, become the Carbon Preservation Society.

This is for everyone - for all those feeling helpless to affect climate change. We are not powerless. Within this new campaign, let's create a web of local, regional and worldwide carbon preservers. Let the great and the good give the annual prizes!

Malcolm Fowles

Reading, Berkshire

. I have supported tree protection and worked to encourage and undertake both small- and large-scale tree planting for all of my professional career.

I have undertaken much planting myself in my own semi-rural parish. I propagate trees from our local native, established giants!

There are so many issues relating to this work at all levels, including encouraging local authorities and landowners to support, protect and maintain trees on their own land.

But, putting that matter to one side, one of my biggest concerns for the last two decades has been the ever-increasing reliance on plastic tree protectors, along with their sturdy tree ties. The result is that we see plastic tubes - either whole or in pieces - contaminating and strangling our planting schemes, littering our landscapes, watercourses, open spaces, highway embankments and verges, existing and new woodlands.

This practice must be resolved so that we can have healthy, protected trees but without the plastic contaminating litter residue.

I suggest new products, new materials, more input into good planting design and practice, in order to reduce reliance on tree tubes, and much more positive management.

Anne Westover

Westover Landscape Ltd

. Your correspondents are correct in asserting that planting permanent stands of hardwoods can contribute a great deal to sequestering carbon from the atmosphere. Every hectare of hardwood in a temperate climate with adequate water can accumulate at least 20 tonnes of aerial biomass annually for 30 years - 600 tonnes per hectare. But then sequestration stops on that plot. The trick is what to do next, but the answer is at hand.

Simple technologies with very low carbon emissions are available to harvest accumulated biomass, recover most of the sequestered plant nutrients, and densify the remainder to above 1 tonne per cubic metre - the density of water. Provided the right species are chosen, the roots left in the ground will sprout and within two years the carbon-capture process will have resumed as rapidly as before. Pop down to your local coppice to see what I mean.

If the densified wood is deposited in the deep ocean, below 1,000m, where it is cold, dark and with little oxygen, it is there for good. Even if some organism worked out how to use the densified wood for metabolism, any CO₂ or methane produced would remain a solid, out of the atmosphere for ever.

To indicate the enormous volume available in which to sequester carbon in the deep, 1bn tonnes of CO₂ deposited there would raise sea level by 2 nanometres. If all the annual CO₂ emissions were dealt with in this way, sea level would rise by the thickness of a human hair.

Dr Graeme Coles

Chairman and technical director, Knewe, New Zealand

. The natural climate solutions approach proposed by scientists and activists including Michael Mann, Greta Thunberg and George Monbiot is a vitally important component of our global approaches to tackling climate and ecological breakdown. But carbon sequestration by trees (the removal of carbon dioxide from the air via net photosynthesis), and carbon storage in forest ecosystems (especially soils) are only two of the methods by which sustainable forest management can combat climate change.

The third method is the carbon substitution effect achieved by replacing fossil fuels, either directly as bioenergy, or indirectly through use of wood (for example as structural timber) instead of higher carbon footprint materials, such as concrete and steel. In the UK, with only 13% forest cover, we are less than 20% self-sufficient in wood products and thus need to increase all three methods of using forestry to mitigate climate change. Otherwise we are dependent on importing harvested wood from other parts of the world rather than helping restore their forests.

Climate-smart forestry is an approach that considers how natural woodlands and commercial forest plantations need to adapt to climate change while maintaining, and increasing, their climate mitigation through individual trees, in the forest and by products from the forest. This needs to be achieved without reducing the other benefits to society that the forest habitat provides, such as flood mitigation, access for recreation and associated health and wellbeing.

Dr Andrew Weatherall

National School of Forestry, University of Cumbria

. Conserving natural ecosystems to help mitigate and adapt to climate change is indeed an urgent necessity. A key question is how such places should be managed and secured.

The world's protected area network already covers 15% of the planet's land surface and its role in defending against climate change is recognised, for instance in a groundbreaking declaration by 18 Latin American countries at the Paris climate meeting in 2015. Additional opportunities include the territories of indigenous peoples, plus many community lands and other natural landscapes. But the survival of all such areas is fragile: national parks and nature reserves are being de-designated or degraded, indigenous peoples forced off their lands and conversion of natural forests has in many areas increased recently.

Bold targets for avoiding further conversion of natural habitats are needed. Collaboration between conservation and human rights groups can help to ensure that protection does not further disadvantage the people who live in near-natural ecosystems, who are often among the world's poorest. Pressure must be kept on governments and industry to honour existing conservation pledges and to increase these to the levels needed to provide a measure of environmental security.

Nigel Dudley

Equilibrium Research, Bristol

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