3. Forestation risks

Soil disturbance from historical afforestation and reforestation in peatland has caused disastrous levels of greenhouse gas emissions. As a priority, all drained peatlands should urgently be restored to prevent catastrophic continuing carbon loss which could overwhelm reductions from cutting fossil fuel use.

However, huge areas of forestry are now targeted for grasslands which also have massive vulnerable carbon stores that are vitally important to protect. Unless more sensitive rewilding is applied instead, forestation will also create irreversible damaging impacts on these varied biodiverse ecosystems.

The climate crisis is causing an increasingly water-stressed world of lengthening droughts and draining aquifers as well as rapidly shrinking glaciers which have been relied on for generations to supply lakes and rivers throughout the year. With critically damaged agricultural land now even more highly threatened, widespread afforestation would further endanger global food security.

Slow growing trees would need decades to secure substantial net carbon sequestration. If afforestation in colder regions is undertaken with conifers for faster growth, however, these darker trees can exacerbate global heating by absorbing more solar energy through the reduced albedo. This reduced solar reflection can also result from tree-planting in regularly snow-covered areas.

Furthermore, on a timescale of centuries, enormous volumes of wood would need to be harvested and permanently stored in ways that prevent decay indefinitely. If the preservation approach is insecure rotting timber will release methane with a much higher global warming potential (over its shorter atmospheric lifetime) than CO_2.

More importantly, forests are not reliable, long-term carbon sinks or stores. In addition to the threat of legal or illegal logging/clearing, trees are increasingly vulnerable to damage from pests and diseases with rising temperatures. Alarmingly, wildfires from the growing frequency of extreme heatwaves and extended droughts are already causing CO_2 emissions at the level of those produced by the EU.

Tropical forests have also already been recorded to have become net sources of greenhouse gases through degradation. Protecting existing forests, though crucial, is therefore, at best, maintaining existing levels of carbon sequestration, or just carbon neutrality, or even limited emissions, and cannot be a genuine secure carbon mitigation approach.

As a result, afforestation, reforestation and forest protection are not reliable carbon mitigation routes, which must be based on secure carbon negative techniques.