

Why tree planting in rangelands can be bad for biodiversity and the climate



Huge global targets for tree planting are being set; everyone is urged to plant a tree to save the planet. But does this always make sense, particularly in rangelands where pastoralists live?

Discussions in the run up to the UN's COP15 conference on biodiversity have focused on tree planting as a way to combat desertification, improve biodiversity and address climate change through 'carbon offset' schemes. Many of these initiatives are deeply problematic, yet have targeted over one billion hectares of rangelands across the worldⁱ.

For example, in 2011 the United Nations' Bonn Challengeⁱⁱ proposed that 350 million hectares of land would be 'restored' through tree planting by 2030. National governments and regional blocs also have plans for more tree planting on a very large scale, including notorious projects such as the Sahelian 'Great Green Wall'ⁱⁱⁱ. The AFR100 initiative^{iv}, funded by multiple international donors including the World Bank, has committed to afforesting 100 million hectares in Africa over the coming decade. Meanwhile, the one trillion tree (1t.org) campaign^v from the World Economic Forum aims to transform landscapes by 'conserving, growing and restoring' trees.

RANGELANDS AS OPEN ECOSYSTEMS

Rangelands cover over half the world's land surface and are a critical, biodiverse ecosystem, with huge potentials for carbon sequestration in soils and grasslands^{vi}.

Rangelands are 'open ecosystems'^{vii} including variegated mixes of trees and grasslands existing together in savannas and parklands, for example. These are maintained by grazing, fire and human actions, and are some of the most biodiverse areas on the planet.

Grasslands have extensive root systems and high turnover with dead vegetation matter regularly incorporated into the soil, often assisted by grazers. Compared to darker forests, grasslands can also be more reflective of solar radiation and so can act to cool the earth^{viii}.

Yet most 'carbon offset' schemes, increasingly seen as central to both climate and biodiversity efforts, focus on trees and above-ground biomass. Carbon in trees is much more visible and measurable – and therefore marketable – than the poorly-understood grasslands and below-ground carbon dynamics among root networks and in the soil.

Rangelands, maintained by grazing of livestock and other herbivores over millennia, are therefore not degraded lands in need of restoration through mass tree planting to a supposedly 'natural' closed forest.

COLONIAL MISUNDERSTANDINGS

The obsession with closed forests and tree planting has a long history, seeing grasslands as 'degraded' forests subject to 'desertification', with forests positioned as the desirable protector of all environments (see Box 1).

MISUNDERSTOOD RANGELANDS

The idea of the *taux de boisement normal*^x – the percentage of forest cover required by a 'civilised' nation – took hold in the French colonies from the 1800s, and since then tree planting has become part of what Diana Davis describes as a civilising mission to offset 'desiccation'^x and the assumed ravages of desert advance. Equally, the negative description of rangelands as 'wastelands' in India has framed attempts at environmental rehabilitation from the colonial era to today.

Much of the current well-meaning advocacy of reforestation replicates colonial discourses. This creates a colonisation of environmental debate through tree planting and rewilding schemes, frequently linked to carbon markets, which are misleadingly presented as central to addressing the twin crises of climate change and biodiversity loss.

'THE TROUBLE WITH TREES'^{xi}

1. Most tree planting projects focus on exotic, fast-growing trees. These are assumed to produce the most carbon in the shortest time. But fast-growing trees planted in rangelands can become a big problem. Many pastoralists in East Africa testify to problems with the invasive shrub *Prosopis juliflora*^{xii}, originally introduced by aid programmes to provide fuelwood. Exotic tree planting also eliminates existing grassland ecosystem biodiversity, which has emerged over millennia through the interactions of vegetation and herbivores.
2. Carbon forestry projects require managed tree planting to claim carbon credits against an assumed degraded baseline. The easiest approach is the planting of large plantations. These are easy to manage, and the carbon credits can quickly be calculated and cashed in^{xiii}. But plantations exclude people, livestock and wildlife and can seriously undermine plant biodiversity too. A rush to net zero^{xiv} through tree planting could have major implications for land rights, food security and rural inequality^{xv}.
3. Rushed planting of trees in unsuitable environments can lead to large losses of planted trees. Areas are cleared, trees are planted and then they die, with no benefits to anyone. In calculations of carbon credits sold in burgeoning carbon markets, this may have resulted in 'avoided deforestation', but the consequence is often the laying waste of productive environments^{xvi}.
4. Tree planting in grasslands, aiming for a managed, stable forested area, runs counter the natural ecosystem dynamics of such areas. In tropical grassy biomes^{xvii} the amount of trees and grasslands fluctuate, with patches of each increasing and decreasing because of rainfall, fire and other factors. It makes no sense to impose a standardised regime of management, assuming baselines and calculating predicted carbon gains, on such a dynamic setting.
5. Tree planting schemes from which people and animals are excluded can result in the massive build-up of flammable herbaceous material. Without regulated 'cold burn' fires, the consequences of forest fires can be devastating, as seen around the world. This can result in huge losses of carbon – exactly the opposite of what is intended (see *Brief 4*).
6. Water cycles may also be disrupted by tree planting schemes, as fast-growing trees need a lot of water to grow. By contrast, grasslands have high levels of infiltration and are important in maintaining hydrological systems. Carbon schemes however do not put a price on water, so trees win out.
7. The landscape value of tree plantations – serried rows of exotic trees – may be lower than that of long-established grassland systems, where cultures of livestock-keeping and wildlife use have created a lived-in landscape.

The longstanding obsession with tree planting as a route to addressing climate and biodiversity challenges must be rethought. Covering over half the world's land surface, rangelands - as 'open ecosystems' – require a very different approach.

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