

# Resilience of tropical forest gives hope

**Much of the tropical forest cleared for farmland that is later abandoned grows back within a few decades. Almost total recovery is possible within 120 years. A surprisingly positive message, say the researchers.**

TEXT ROELOF KLEIS PHOTOS ALAMY

A lot of tropical forest is still being destroyed for the sake of crop and livestock farming. Much of that land ends up lying fallow: the soil becomes exhausted, and farmers stop or move elsewhere. The forest then grows back on the abandoned land. And that process is going encouragingly fast, according to a large international study led by Wageningen forest ecologist Lourens Poorter.

Poorter and his colleagues charted the growth of what is known as secondary forest in the tropical rainforests of South and Central America and parts of West Africa. Not by monitoring the development of forest plots over time, but by comparing forest plots of varying ages, i.e. the number of years since the fields or cattle pastures were abandoned. This approach was pretty much born out of necessity. 'There is not much longitudinal research available on these kinds of plots,' Poorter explains. 'Very few of these small woodland areas are monitored over time, and if they are it is often for no more than 20 years. And yet it is precisely the longer-term recovery that is interesting. When you compare secondary forests that vary in age and are at different stages of recovery, a kind of timeline of forest recovery emerges'.

## 2275 PLOTS

In the study, which was published in *Science* in mid-December, more than 2275 plots of secondary forest were compared across 77 landscapes. These were small

sample plots, on average only 0.1 hectares in size, once used for shifting cultivation or as cattle pasture by small farmers. The study recorded the speed and completeness of the recovery of many forest characteristics, such as forest structure, species diversity and composition, soil carbon content and its functioning as an ecosystem. The results are encouraging. Nature picks up where it left off surprisingly quickly. Within 20 years, many of the characteristics of the former forest are back at nearly 80 per cent of normal levels. An almost complete recovery is possible within 120 years. That is, if the forest is left alone. Some characteristics recover faster than



## ‘Recovery is going much faster than expected’

others, however. In the case of the soil, recovery usually takes no more than a decade, and the wood and leaf properties recover in less than 25 years. Biodiversity, on the other hand, needs more time to return to its former level: between 20 and 60 years. Not that everything will be as it once was after 60 years. The number of species does recover, but they are not always the same species. Moreover, it can take a long time before tropical trees are really mature. So full recovery takes at least 120 years.

### NEIGHBOURING TREES

The researchers conclude that secondary tropical forest is highly resilient, as long as the land was not used for agriculture for longer than three to ten years. Poorter: ‘The longer and the more intensively you use the land, the more you deplete it and the slower the recovery.’ Moreover, the soil must still contain sufficient seed to provide for new growth. It is essential that there is older forest nearby. Seeds from neighbouring trees can then colonize the terrain.

A large area of land is now covered by secondary forest. More than a quarter of the neotropical region – the tropical forests of South and Central America – is host to secondary forest that grew back after the land was used for agriculture. Poorter says the study shows how important these forest plots are for restoring biodiversity and achieving climate targets. ‘Tropical forest is not lost

forever after being cut down. The recovery goes much faster than expected. That is the surprisingly positive message of this study. I am an optimist by nature. For me, the glass is always half full. But now, after 20 years, it turns out to be 80 per cent full!’

This positive message comes with a hefty disclaimer, however. ‘This is not a “licence to kill”, in the sense of: just go ahead and do your thing. There is very little old tropical forest left. So let’s do our best to preserve what we have.’

### HELPING HAND

That recovery does not have to cost much. Nature does most of the work, assisted here and there by active management, depending on local conditions. These local conditions are important. On average, secondary forest recovers rapidly, but there are big differences between locations. Recovery takes much longer in places where there is not much seed or where an invasive species is dominant. In those places, a helping hand is needed in the form of replanting, weeding or creating ecological corridors to the area. ‘Use natural forest restoration where possible and plant where necessary. And another good option could be agroforestry: a combination of agriculture and forestry.’ ■

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Tropical forest that is felled for agriculture is not lost for ever; 80 per cent of it has recovered within 20 years.