From tiny forests

Why the Miyawaki method is gaining ground in the fight against climate change

Forests are vital for the natural world and the existence of all life on Earth. According to global conservation organisation WWF, we depend on them 'for our survival, from the air we breathe to the wood we use. Besides providing habitats for animals and livelihoods for humans, forests also offer watershed protection, prevent soil erosion and mitigate climate change'. And yet a major cause of the latter is the alarming rate of disappearance of these carbon sinks. Experts estimate that the equivalent of around 36 American-football fields of trees are lost every minute because of deforestation – a figure that is both startling and unprecedented.

That's why afforestation – planting new saplings where none existed before – and reforestation – replanting trees where they once grew but have been destroyed – are so important to the fight against climate change. While environmentalists are constantly thinking up new ways to approach the issue, one idea is experiencing a resurgence: the Miyawaki method.

This particular afforestation technique is named after Japanese botanist Akira Miyawaki, who, in the 1970s, found a way to recreate ancient woodland that could grow quickly and would require just a small patch of land. Using native plant species, his method involved planting saplings very closely together in nutrient-rich soil to create a dense mini-forest.

But what is it about this that encourages such rapid growth? Victor Beumer, senior research lead at environmental charity Earthwatch Europe, explains: 'Part of the methodology for making the trees grow faster is the dense planting. This makes the saplings compete with one another for resources – light, space, water and nutrients – and hence grow quicker.

And space is not the only factor at play – as the densely packed plants fight for the limited resources available, over time 'there will be some natural mortality, with the strongest individuals reaching maturity'. Victor says: 'This is why the combination of species planted is important – there has to be an even distribution of trees from all the forest layers, so that each can occupy a different niche.'

As the climate crisis becomes more apparent, the need to deliver impactful solutions with speed is critical. Usually to plant and nurture a new forest from scratch, it would take several decades for the trees to reach maturity. With this method, the growth rate is up to 10 times faster. Couple this with the fact that you need only a small bit of land – as little as 100m² – and it's easy to see why the technique is so appealing, especially in urban spaces.

According to Victor, more than 3,000 of these forests already exist around the world, a number that's increasing significantly as awareness grows. At Earthwatch Europe, the goal is to plant at least 150 more in the UK by 2023. Meanwhile, its partner organisation based in the Netherlands, IVN Nature Education, has planted nearly 100, having established Europe's first in 2015. For this initial project, IVN used the guidance and support of Shubhendu Sharma, an industrial engineer turned entrepreneur who revived the Miyawaki technique and began the Tiny Forest movement in 2009.

It was at car manufacturer Toyota's factory in Bengaluru (formerly Bangalore), India, that Shubhendu met Miyawaki, who had been commissioned to plant a forest there. After joining the botanist's team of volunteers, Shubhendu was so inspired that he left his job at Toyota to establish a start-up social enterprise, aptly named Afforestt. In his 2014 Ted Talk, Shubhendu explained what his motivation was behind this career change: 'I wanted to make more of these forests. I was so moved by the results that I wanted to use the same acumen with which we make cars or write software or do any mainstream business, so I founded a company which is an end-to-end service provider to create these native natural forests.'

Since its inception in 2011, Afforestt has helped international partners like IVN establish these diverse, green pockets around the world. As well as the Netherlands and the UK, mini-forests can be found in Singapore, Iran and Nicaragua, not to mention across the Indian subcontinent, in locations such as Delhi, Lahore and Rajasthan. The movement is well and truly making

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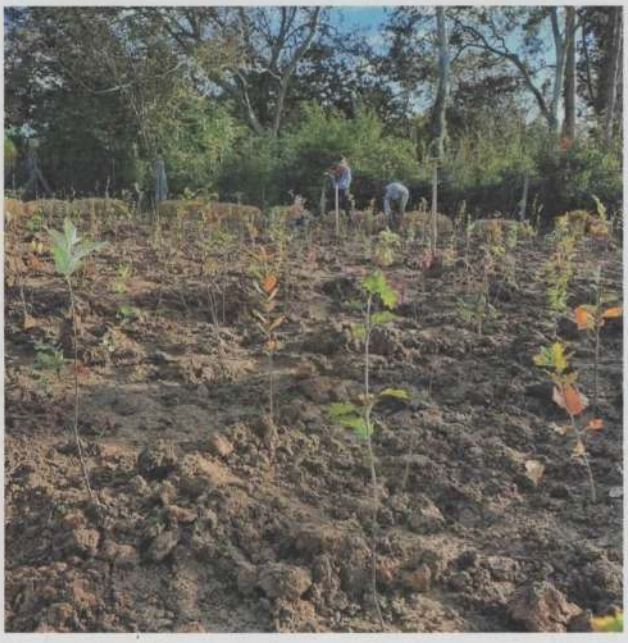

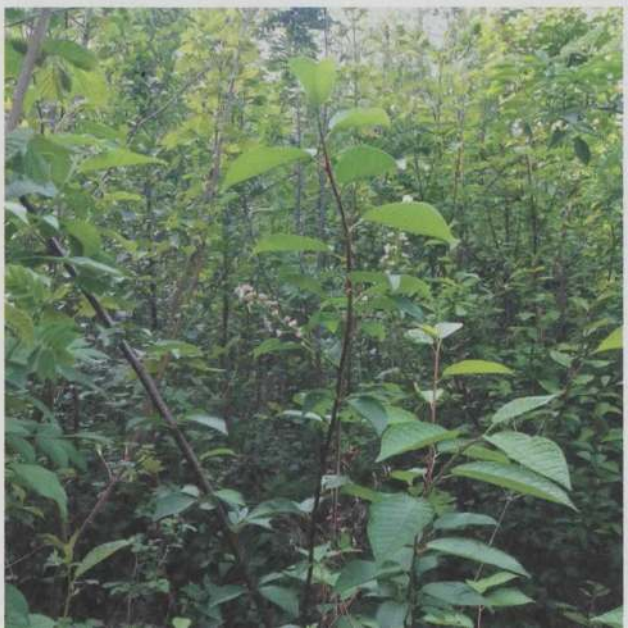

waves across the globe, bringing new life to urban spaces. Indeed, these forests can be especially beneficial for cities, where planting woodland isn't usually feasible. Nicolas de Brabandère, a Belgian naturalist and founder of Urban Forests, a European organisation specialising in this method, says they're 'suited to residential areas, places of work, city squares, parks, museums and commercial buildings, for example'. With that, the technique could help to bring cleaner air into cities, as well as better biodiversity: 'Forests are planted with native species only. They form a very varied habitat, which allows biodiversity to flourish. They're also very dense, creating a sanctuary for all the species living in it,' he says.

Of course, a haven for flora and fauna can also be one for humans. The Food and Agriculture Organisation of the United Nations has lauded the method, claiming that among other benefits – cooling the air, filtering pollutants, boosting property value and increasing urban biodiversity – these forests can help improve physical and mental health. Imagine walking past a wild and flourishing patch on your daily commute, breathing in cleaner air and watching insects and birds where you would never usually see them. Desolate and unused land could be transformed into a beautiful urban respite that has the potential to improve the wellbeing of those close by – as well as the volunteers who help to create it.

Having led more than 20 afforestation projects across Belgium and France, bringing together hundreds of volunteers, Nicolas has seen first-hand how the process of actually planting these spaces can make a real positive impact on those who are involved, in many ways. 'Miyawaki forests bond communities around a common goal,' he says, 'creating an urban woodland for the common good. People come together to help plant the trees – they get to know each other, they might make friends, they will see the forest grow and become attached to it. They will walk around the space, look at nature and see how a whole ecosystem comes together. They will talk about it and perhaps initiate more such elsewhere.'

Tiny Forests may not be the only solution to tackling global climate change, but they can be a part of the battle and play an important role in helping towns and cities on their journey to becoming carbon neutral. With the potential to improve wellbeing and bring members of the community closer together too, it certainly seems like a worthy technique to consider.

Words: **Emma Gillies**

Find out more about Tiny Forests at earthwatch.org.uk, urban-forests.com and afforestt.com.

HOW DO YOU CREATE A MIYAWAKI FOREST?

Here are a few of the basic principles. You could find a local environmental organisation and start a conversation about planting a mini-forest in your community.

- **Find an appropriate space**. 'The surface area should be at least 100m²,' says Nicolas, 'with no underground networks such as water, electricity and phone lines. It also needs to be no less than 5m from the nearest infrastructure so that the mature forest will not become a problem.'

- **Prepare the soil**. According to Earthwatch, adding natural, local materials, water retainers and perforators will encourage the saplings to establish quickly. Organic fertilisers will also provide nourishment.

- **Use native species**. It's recommended to have at least 30 different varieties to increase biodiversity and help mimic a natural forest.

- **Plant densely in layers**. The different saplings need to be close together – three to five per square metre is ideal. Plant as randomly as possible and avoid placing the same species all next to each other.

- **Protect the soil and saplings**. Cover the soil in mulch to insulate it and stop water from evaporating. It's also advisable to tie young trees to support sticks to make sure they grow upwards over the first few months.

- **Nurture it**. For the first two years, your mini-forest needs daily watering and regular weeding, but make sure not to cut the trees. After three years, the forest will be self-sustaining and can be left to tend to itself.