

# He Ngahere, he Korowai

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**Ko te Ngāhere he Korowai, he tohu aroha mo Papatūānuku. Ko tana tamariki a Tāne Māhuta e mōna.**

**The forest is a cloak, a symbol of love for Papatūānuku. Grown for her by her child Tāne Māhuta.**

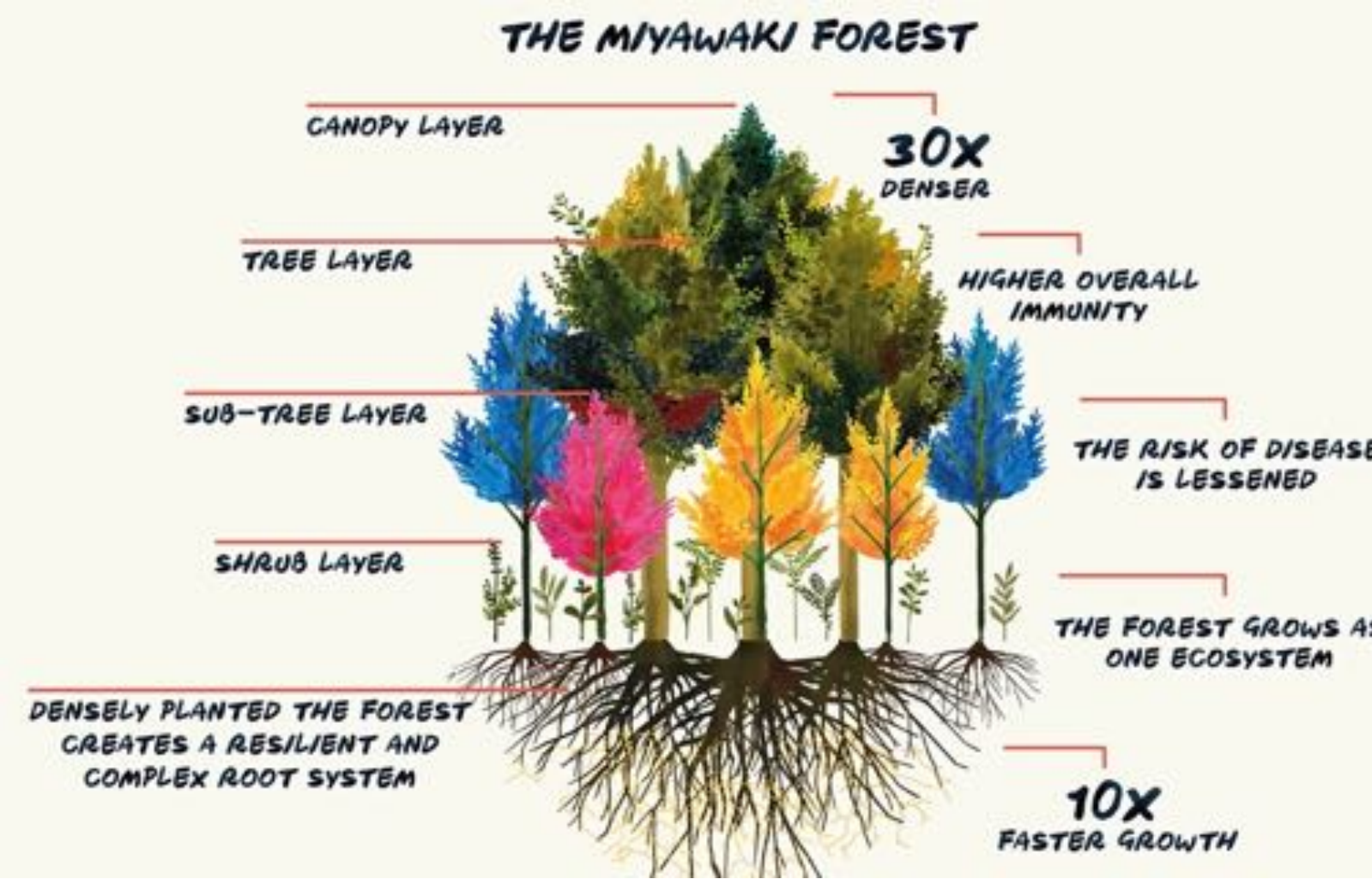
Our forests can bring Nature into cities and towns. If the best practices are followed in keeping with nature, AS CLOSE as possible to the level of detail Tāne reached in his efforts – the pinnacle of excellence – then the standard has been set. Nothing but the best is the expectation and the goal.

All the very best that nature has to offer could be shown off in a tiny forest. This could be realised in a town like Wainuiomata for Whānau of all ages. Something the entire community will benefit from.

The method<sup>1</sup> was devised by Akiro Miyawaki<sup>2</sup> in the 1970s, later promoted in India, Netherlands, and now by UNESCO.<sup>3</sup>

Typically the size of a tennis court, but as small as 100 m2, or strip 4 m wide or even less.<sup>4</sup> Planted at 3 saplings per square meter, typically 30-60 species, with ferns, shade-loving shrubs, mid-canopy and emergent trees. Forest gains more than 1 metre in height/year for up to 20 years.

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Schools in the Netherlands have planted >200 tiny forests. Scotland is funding 20 tiny forests post-COP26. Akiro Miyawaki always had children do the planting.<sup>5</sup> A Nelson community planted New Zealand’s first Miyawaki forest<sup>6</sup>, using biochar to improve the soil. Wainuiomata Marae now plans a tiny forest as part of cultural playground that celebrates the indigenous ancestors, early settlers, and history and ecology of the district. Plants must be eco-sourced: from volunteer “potting groups” or local nurseries. Government’s Biodiversity Implementation Plan<sup>7</sup> and Climate Adaptation Plan<sup>8</sup> call for: “...joined up efforts that tackle biodiversity loss and climate change together.” Hence Jobs for Nature as a funding source.

## Rescue Forests

photos Molly Melhuish  
Deer are stripping palatable forest understorey in Hutt hills<sup>9</sup>; deer and rabbits damage restoration plantings. Tiny forests in the city could preserve species and become seed sources.



## New Zealand’s first Miyawaki Forest, Nelson

Height after 14 months, up to 2.2 m. Soil augmented with biochar and mushroom compost.

## Deer and rabbit damage



Damage in forest restoration at Waiu Swamp, Wainuiomata. Clockwise: 5-finger, māhoe wao, lemonwood – do these trees have any future?

## Tiny Forest Near Rotterdam

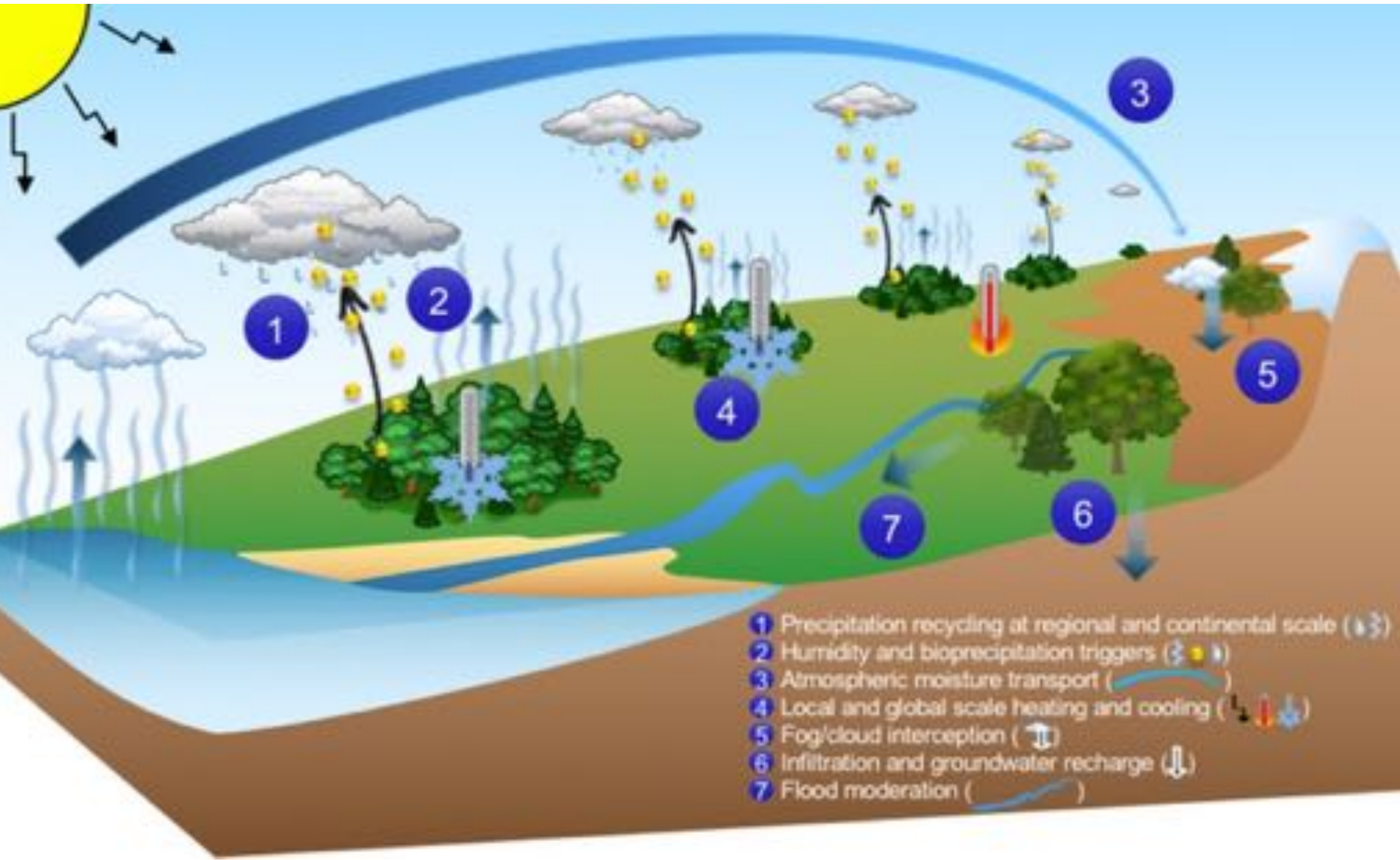


Photo, Francesca Pouwer

A tiny forest 2 years 5 months old. Highest trees are 3 to 4 metres high. Logs in a circle, open space next to tiny forest, with insect hotel, and path through the tiny forest. Information board, great graphics and explanations – it says that children in the local community planted it and are forestry rangers who protect it and learn as they go.

The open space with tree logs is an outdoor classroom and a lovely spot for people to come together, and even hold birthday parties. The forest brings Nature to a 22-storey apartment just across the road – see top right.

## The science: how trees drive the water cycle

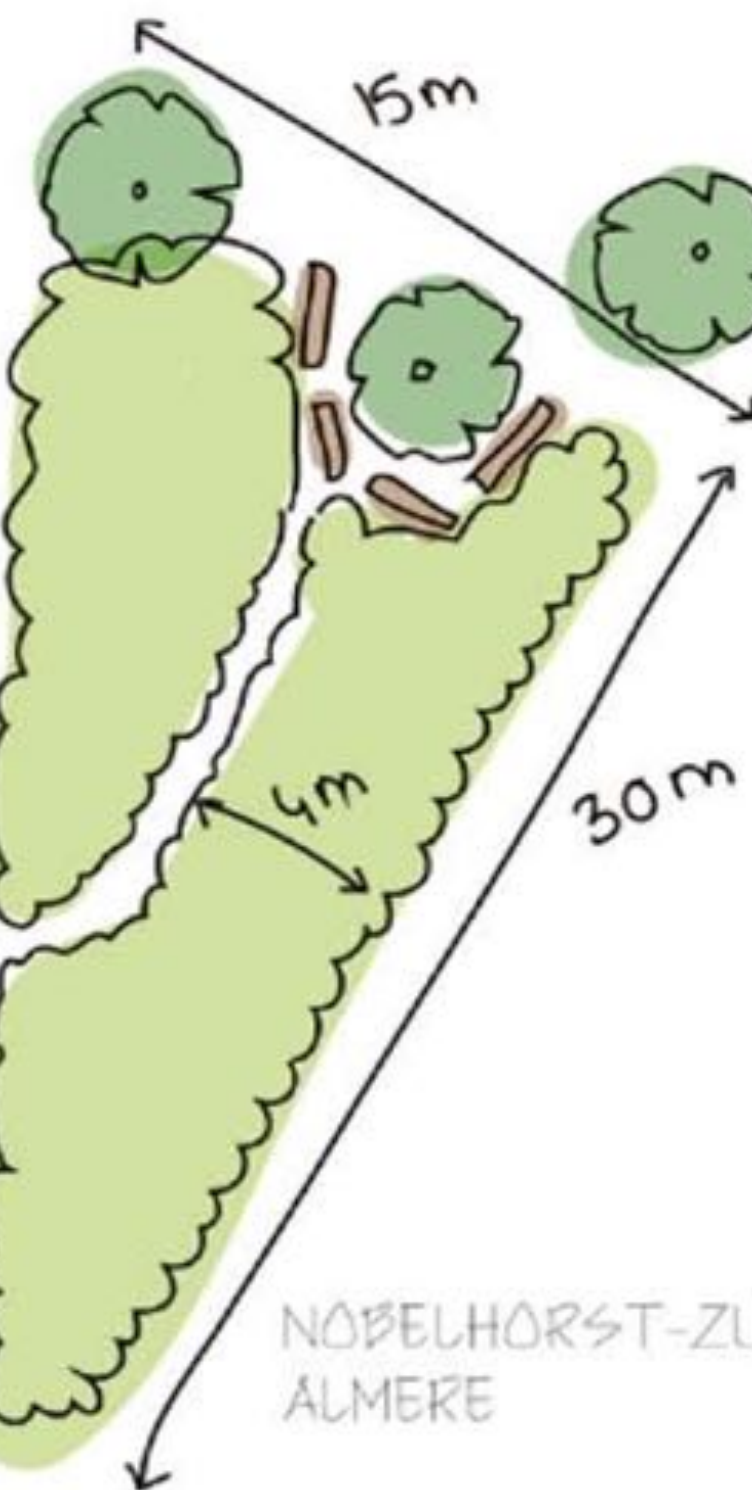


The sun’s energy that warms the planet also builds biomass. Forests and trees are prime regulators within the planet’s water, energy, and carbon cycles, which planners must understand in order to assess, adapt to, and mitigate the impacts of changing land cover and climate.<sup>11</sup> Over 70% of solar radiation reaching densely packed natural vegetation is actively transpired into the air as water vapour.”<sup>13</sup> The number and types of urban trees can play a commanding role in cooling cities, offsetting heating from paved surfaces,<sup>14</sup> and controlling storm water.<sup>15</sup>

## Ecosystem services

“Working closely with nature to create effective human settlements while maintaining healthy ecosystems has been a cornerstone of many very old Indigenous belief systems.”<sup>16</sup> Databases of blue and green infrastructure in fifteen world cities<sup>17</sup>, and the Miyawaki method.<sup>18</sup> A tiny forest is not a natural forest, but a designed system creating biodiversity, health, resilience.

## Example, Tiny Forest design<sup>10</sup>

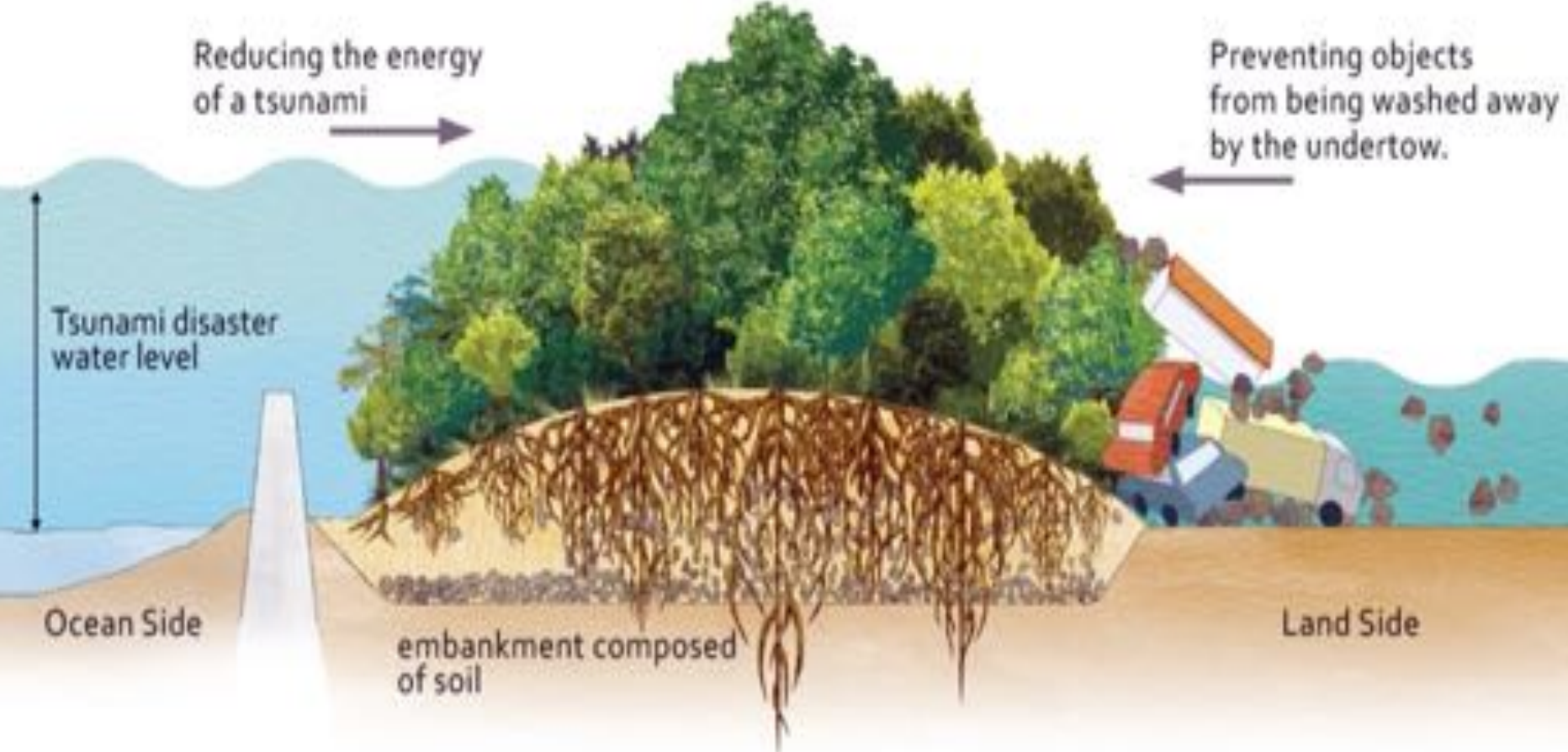


## Urban intensification

Building up to three houses into backyards replaces gardens and mature trees with roofs and driveways. Urban regeneration is best tackled at the precinct level<sup>19</sup> – consider forest belts on active transport routes. Trees in the urban environment mitigate many environmental, social, and health issues.<sup>20</sup> A “simpler way” is needed to respond to climate change and resource scarcity;<sup>21</sup> traditional uses of native ecosystems translated to urban settings would support that goal. Ecological economics recognises the fundamental importance of nature’s services to human economies, but today’s financial systems ignore this reality and are driving unsustainable economic growth.<sup>22</sup>

## Disaster-preventative forests

A Miyawaki forest, with interlocked roots and branches, mitigates harm from tsunami, flood, wind storm; its high moisture content mitigates harm from fire.<sup>23</sup>



A narrow belt of trees protected adjacent buildings from massive fire after earthquake.<sup>23</sup>

## Costs (growing, planting, maintenance of trees)

Miyawaki method requires at least six times as many plants as ordinary forest restoration. Planting is just 5% of the the cost of urban tree management in USA cost; pruning is almost half. <sup>24</sup> Open-ground stock is potentially half the cost (\$0.50-\$1.50) of the commonly produced larger container options (\$2.50-\$3.50), but ‘shelf life’ of bare root plants after lifting is very limited.<sup>25</sup>

## Research priorities – both university and citizen science

Comparison of Miyawaki planting with traditional native forest restoration:

- Biodiversity of birds, other vertebrates, insects, soil fauna, and fungi
- Carbon sequestration above and below ground
- Microbiology of soil under trees planted into grass compared to modified or structural soils

Practical research on planting strategies:

- Survival of containerised vs bare-root stock, and costs of each
- Growth rates of trees in loam vs. “structural soil” (designed for trees on streets)

## Collaborators

Star Olsen, Wainuiomata Marae  
Francesca Pouwer, Fridays for the Future Aotearoa  
Jennifer Vinton, Forest&Bird Lower Hutt  
Pam Crisp, Transition Towns Lower Hutt

## Epilogue

“We paved paradise! – and put up a parking lot!”  
Urban intensification is designed to reduce car numbers but will remove many mature trees. Let’s turn some of those parking lots into tiny forests!

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