

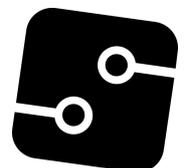
Whitepaper

Why trees matter for our wellbeing

A growing body of empirical evidence
tells us how vital trees are for city dwellers



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Summary

Time is of the essence in combating climate change. Besides reducing carbon emissions, carbon sequestration offers additional strategies. Planting forests is one way, maintaining trees in cities another. Moreover, trees provide corroborated beneficial health effects for people. Not the least of which, contributing to alleviating depression. The Return-on-Investment for policy makers to care about trees in- and outside cities tends to be net positive. A helpful ally in the pursuit of net zero. Sobolt's Treetracker offers smart AI software to track status and growth of said green marvels.

1 Introduction

The impact of sustainability endeavors — or lack thereof — on the wellbeing of ecosystems is well-documented by now. A [new](#) global report is out every few months; calling our collective attention to the urgency of the situation. We need to build and behave more sustainably. Infinite economic growth has indeed hit its limits; several outdated paradigms are ripe for innovation. The time is now.

We can no longer consume ad infinitum, we can no longer ignore our vital ties with nature itself. The CO₂ transition has begun, although it merits considerable acceleration. Wellbeing is in a similar, early stage; characterized by surges in investment & awareness. We've reached stage one, time still doesn't stand still.

2 Carbon sequestration

Reducing emissions and consumption is a massive undertaking, but there's another side to the story. In our pursuit of net zero, we cannot lose track of the positive contributors; actors that form the green pluses on our balance sheet. The most commonly used example to indicate such a counter force — and in the process, illustrate what CO₂ absorption actually means — are trees. For good reason. To offset one person's CO₂ footprint, 730 trees have to be planted. Every year. That's 7 football fields. Trees can [help](#) cities & countries meet 15 of the 17 United Nations Sustainable Development Goals.

A 2019 study by the Swiss Institute for Integrative Biology (published in Science) [estimated](#) that an additional one trillion trees would substantially improve our odds of not getting absolutely smoked by climate change. For context, a trillion trees can absorb the equivalent (205 GtC) of 4.8 times the annual, global carbon output (43 GtC).



The study also concluded forest planting is among the most effective strategies for going carbon neutral, and is undoubtedly achievable. However, a billion trees aren't exactly planted in the blink of an eye. Nor are they fully grown in a heartbeat. On average, an 80 year-old tree [absorbs](#) 100 times more CO₂ than does a young one. Respect thy elders. That's not to say we shouldn't plant new forests, because if we don't plant them now – when will we?

3 Trees help alleviate depression

Besides sucking up CO₂ for us, trees mitigate heat and pollution in cities. If you think that's all trees do for us, you are sorely mistaken. The sustainability saga entails more than CO₂, it is also a matter of wellbeing. Literally. Bratman and his 25 colleagues (from 29 different institutions) [found](#) that one additional tree per kilometer of street, corresponded with 1.38 fewer antidepressant prescriptions, pre-Covid (2019).

In another study, the supplemental effect of trees in a greening experiment, resulted in a 41.5% [decrease](#) in local residents who were feeling depressed. This number shot up to 68.7% for people in neighborhoods living below the poverty line.

The current evidence base for the association between experiencing nature and psychological wellbeing can be summarized as follows ([Bratman et al., 2019](#)):

- increased positive affect (immediately)
- happiness & subjective wellbeing
- positive social interactions, cohesion & engagement
- sense of meaning & purpose in life
- improved manageability of life tasks
- decreased stress, anxiety & depression
- improved sleep
- more physical activity
- better cognitive function, memory, attention & impulse inhibition
- improved children's school performance, imagination & creativity





Even merely looking at trees gives mental benefits ([Attention Restoration Theory](#); or ART, Kaplan 1995).

4 Arboreal bang for your buck

At a prevalence of 4.5%, depression cost Europe 118 billion euro in [2004](#), or 253 euro per European citizen. A young horse-chestnut tree comes at 60 euro, is considered an excellent carbon sink and medium grower at a rate of 33–61 cm per year. They take 15–20 years to reach maturity. All-in-all a reasonable tree-deal. No wonder they are quite common in cities. You can recognize them by their chandelier-like white flowers in May. Horse chestnuts are not edible.

With the advent of (very) smart software comes the possibility to plan and maintain better. Policy makers are given tools to track the state of the green capital in their city, as well as calculate the boost in health for the public – as a result of all these green marvels. Before a project begins, the additional health benefits of parks & trees can be taken into account.

5 The largest reallocation of resources in history

To give an idea of the (current, economic) value of wellness; it's a 4 trillion euro global market, yearly. Climate-friendly goods, services & technology could [generate](#) 11.5 trillion euro in annual revenues by 2030, the biggest reallocation of resources in history. Financial [institutions](#) responsible for more than 124.3 [trillion euro](#) of capital have announced that they will divert these assets towards keeping the rising under 1.5°C.



Attention goes where money flows, and vice versa. Inserting wellbeing into GDP would solve a few minor issues, though that is a story for another day. Harvard Business Review reports 4 euro is [returned](#) to the economy for every euro invested in caring for people with anxiety or depression. 3 out of 5 working people [report](#) feeling stressed, anxious or depressed (2022). Things appear to be getting serious.

6 Sobolt's contribution: Treetracker

[Treetracker](#) is [Sobolt](#)'s solution to map any city's green capital. The software cleverly paints the picture of how the trees in your city are faring, using data from Geospatial Information Systems. Sobolt's AI engineers train these models and create a better understanding of the eco-impact of city trees. This translates into tangible carbon emission numbers and perhaps, one day, the wellbeing of people.



Millions of measurement points collected into high-quality tree information with the deep-learning model of Treetracker, as collected with a mobile scanner (www.treetracker.ai)

Let us join forces, so we can all thrive and flourish together.





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