

## **Planting trees can be one tool to fight climate change - if we do it right**

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With a growing number of tree planting initiatives at regional to global scales, Karen Holl and Pedro Brancalion highlight in their latest research how planting trees is much more complicated than it seems. Here they share their findings, including guidelines to increase success of these ambitious efforts world-wide.

Planting trees is so satisfying. You dig a hole, put a tree seedling in the ground, fill the hole with soil, and voila, you have done something good for the planet and future generations. So it's not surprising that governments, businesses, conservation organisations and people everywhere are talking about planting trees – lots and lots of trees. But is it really that simple?

Unfortunately, no. Tree planting as a sole strategy is not the silver bullet to solve multiple environmental and social problems. Instead, well-planned tree planting incorporated amongst the toolbox of strategies to protect and increase forest cover can provide many benefits to people and the millions of other species that depend on forests. Haphazard tree planting can have unintended consequences and instead requires extensive planning and an ongoing commitment to achieve the desired outcomes.

In our latest paper in the *Journal of Applied Ecology*, we provide guidelines on how to direct the enthusiasm for large-scale tree planting in a way that maximizes the benefits.

1. Address the underlying drivers of forest degradation. At the same time as the number and scale of tree planting initiatives is exploding, large swaths of existing forest are being cut down, including old-growth forests that could never be replaced by tree plantations. It is extremely challenging to recreate a complex forest ecosystem and it takes decades to centuries for forests to recover. So the most important and effective way to increase forest cover is to prevent clearing in the first place. This means providing alternative sources of income for people who protect forest on their land, strengthening legal enforcement, and promoting supply chain interventions to curb deforestation.

2. Integrate decision-making across scales. The innumerable tree planting initiatives range from those committed to planting a few trees in a school backyard to a trillion trees across the planet. These groups are motivated to plant trees for different reasons which often are not aligned and may even be in conflict.

For instance, to offset its greenhouse gas emissions, a global corporation provides funding for a conservation organisation to plant trees. The conservation organisation aims to provide habitat for endangered species but it does not own the land, therefore it uses the money to plant trees on farmers' land. The farmers, in turn, want to plant trees in areas that are not good for crops and plant species that provide benefits, such as fruit crops and erosion control. These different motivations for tree planting need to be coordinated and balanced as there are trade-offs.

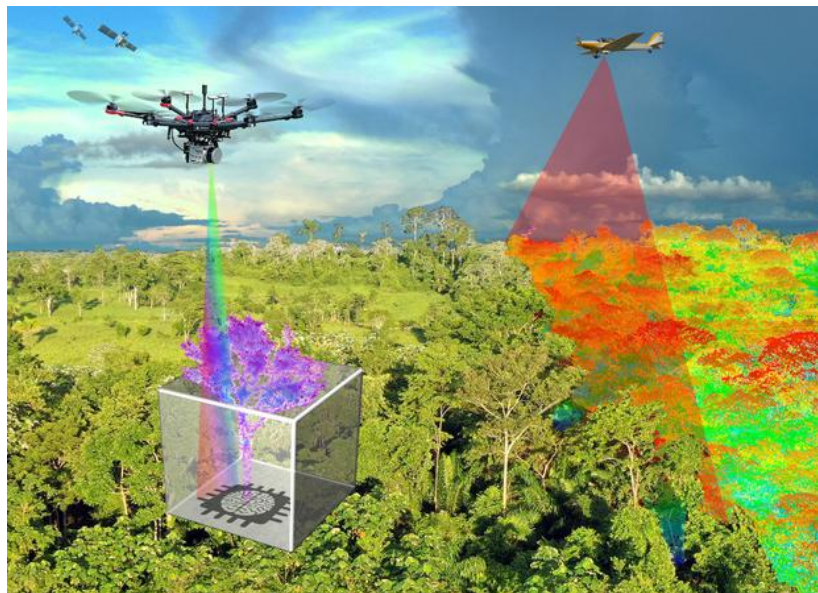


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#### **Some of the many reasons people plant trees:**

- Conserve biodiversity
- Sequester carbon
- Provide shade
- Improve water and air quality
- Increase green spaces in cities
- Comply with legal requirements
- Prevent erosion
- Practice agroforestry
- Earn money from timber, wood pulp, or other products

3. Tailor tree planting strategies to clearly stated project goals and plan, adaptively manage, and evaluate success over a sufficiently long timeframe. Given the many different motivations for tree planting it is important to agree upon goals at the outset and then think through a number of questions about how best to achieve those goals over time. For example, is it necessary to plant trees or will the forest recover on its own (which does happen in some cases)? If it is necessary to plant trees, what species are most likely to grow well at a given site and achieve project goals? Who will take care of the trees? How will we evaluate whether the project has been successful or whether corrective actions need to be taken? Since forests take a long time to recover, the new forest will also need to be monitored and managed for at least a few decades.



Different remote sensing approaches (airplane and drone Lidar scanning, orbital sensors, and machine learning) to monitor forest restoration.

4. Focus on the forest, not the trees. Forests include many types of plants besides trees, such as herbs and vines, as well birds, mammals, insects, fungi, and so much more. These other species play important roles, such as dispersing seeds and pollinating plants. So it's not just about planting trees but about choosing a strategy that restores the whole forest ecosystem which is key to providing the full suite of ecosystem services that people expect from tree planting, such as pollination, erosion control, and water purification.

5. Coordinate different land uses across the landscape. Regional coordination of different land uses is key to successfully balancing the different goals of tree planting efforts. For example, some areas will be protected and restored to provide biodiversity and carbon sequestration benefits whereas some land will need to be used for timber and wood pulp production. Subsistence farmers will need land for agroforestry or sustainable agricultural production. Achieving this balance is crucial to avoid displacing agricultural activities that may promote deforestation elsewhere.

6. Involve all stakeholders throughout the process. Time and time again, top-down projects by international groups or national governments have failed because the planted trees are not maintained, farmers utilise the land for livestock grazing, or the land is re-cleared for agricultural purposes. For tree planting to be successful over the long-term, it is critical that stakeholders at multiple scales are involved in conversations from the beginning of the planning process through to project evaluation and management to ensure that everybody is on board and their needs are met.

Tree planting has many potential benefits but efforts to increase tree cover must be viewed as one component of the multi-faceted solutions to complex environmental problems that must start by reducing the drivers of habitat destruction and degradation in the first place.

Tree planting will receive unprecedented financial, political and societal support in the next few years during the upcoming United Nations' Decade on Ecosystem Restoration and as consequence of ambitious initiatives such as the Bonn Challenge and 1t.org. These are unique opportunities to harness the world's interest for reforestation, and it is essential that all initiatives employ sound science and policy in order to use this global momentum as effectively as possible.





It is time to realise the potential for tree planting to help solve some of the most pressing challenges of our time. To do that, we need enthusiasm combined with careful planning, implementation and monitoring.

Source: <https://www.weforum.org/agenda/2020/12/tree-planting-outcomes-climate-change-environment/>