**Why trees matter – a lot …**

By Tirtha

*“We have underestimated the importance of trees.*

*They are not merely pleasant sources of shade, but a potentially major answer*

*to some of our most pressing environmental problems.” -- Jim Robbins, author*

1. **They create oxygen**

“For every breath you take, thank a tree,” says Diana Beresford-Kroeger, a Canadian botanist, author and medical biochemist. Plants make oxygen through the process of photosynthesis, and trees of course are the biggest plants. “There isn’t any other way on this planet to make oxygen,” she adds.

Trees all over the world have been producing oxygen, and cleaning and filtering the air, for hundreds of millions of years. Whether we realize it or not, we and the world as we know it depend utterly upon the work of trees.

Mankind has embarked on a huge, uncontrolled experiment – we have destroyed about 80 per cent of the world’s forests. More are destroyed every minute. How long can we last without them? Instead of waiting to find out, many people are planting thousands, even millions of trees.

1. **They sequester carbon**

Trees are one of the few things that use up carbon dioxide. They store it as part of their growth process. This is a big help to us, as carbon dioxide is one of the main gases responsible for causing global warming.

In fact, large trees are one of our best defences against climate change. Big, mature trees use more carbon than young trees. That means we need to keep all that we have, and plant a lot more. We also need to avoid cutting trees down or letting them die unnecessarily, because when they are killed, they release much of their carbon.

An Ohio State University website estimates it would take a total of 269 small trees, of 2-inch diameter, to replace the carbon storage ability of a single 36-inch diameter northern hackberry tree! Moreover, all the previous years of carbon sequestration would be lost with the death of the big tree.

Science writer Jim Robbins is the author of numerous articles for Audubon, Scientific American, and Smithsonian among others, as well as the book, The Man Who Planted Trees: a Story of Lost Groves, the Science of Trees, and a Plan to Save the Planet.

He says he once thought tree-planting was at most a feel-good activity.

But now, he says, “In the last few years… as I have read many dozens of articles and books and interviewed scientists here and abroad, my thinking on the issue has changed. Planting trees may be the single most important ecotechnology that we have to put the broken pieces of our planet back together.”

1. **Trees cool the air – and we need that. More and more**

Trees cool the air in several ways. All of them are important, especially in cities, where pavement and sidewalks create a ‘heat island’ effect. Pavement retains heat and releases it at night, causing even nighttime temperatures to be higher in cities.

Global warming is already driving summer temperatures to hotter levels, so we need as much cooling as we can get. Infants, young children, sick people, the overweight, and the elderly are particularly vulnerable to dying from heat, as their bodies are less able to cool themselves.

A study by the Carnegie Institution of Science found that evaporation from tree leaves can cool not only the local area, but also the global climate.

While scientists have known for years that trees absorb carbon dioxide (one of the gases causing global warming) only recently they found this is not the only – or perhaps even the most important – cooling effect that forests have.

An international study published in Nature Climate Change says trees also regulate the exchange of energy between the earth’s surface and the atmosphere. Because of their height, trees powerfully effect heat transfer, by causing movement of surrounding air, and also by releasing moisture into the air.

"Forests play a more important role in cooling the surface in almost all regions of the Earth than was previously thought," said study co-author Kaiguang Zhao, assistant professor of environment modeling and spatial analysis at The Ohio State University.

"This really affirms the value of forest conservation and protection policies in the fight against climate change,” he added.

Trees are also the planet’s “heat shield,” says science writer Jim Robbins. “They keep the concrete and asphalt of cities and suburbs 10 or more degrees cooler and protect our skin from the sun’s harsh UV rays.

“The Texas Department of Forestry has estimated that the die-off of shade trees will cost Texans hundreds of millions of dollars more for air-conditioning.” (Not to mention that the energy to power the air-conditioning will most likely create much more carbon dioxide and even warmer temperatures.)

It is known that planting deciduous trees to the south and west of your home can help keep it cool, and even save up to 30 per cent on your energy bill. (And winter sun will still warm the house, after the leaves drop.)

1. **Trees improve our health**

Studies have shown significant benefits for those who live or work near trees and green spaces, including:

- reduced stress

- greater efficiency, and ability to concentrate and focus

- greater productivity at work or school

- less illness, including asthma, and less sick leave

- better morale

- Japanese studies on ‘forest bathing’, or walking in forests, have shown improved immune response, reduced glucose levels in diabetics, reduced stress indicators, and less depression.

1. **Trees are vital to the earth’s ecosystems**

A Japanese chemist discovered that decomposing tree leaves, and the nutrients they leach into nearby oceans, are essential to the health of phytoplankton and all the species that rely on them.

The loss of forests due to clearcutting had led to the collapse of miles of nearby marine habitat and declining fish stocks. Armed with this knowledge, Japanese fishermen have replanted coastal forests and were rewarded by the return of greater numbers of fish.

Trees, along with some other plants, are able to filter and clean up much toxic waste. This process, called phytoremediation, can even be used to clean up contaminated soil, air and water.

In short, trees are essential to our continued wellbeing, and to the wellbeing of our planet.

To squander the large trees we have is not merely short-sighted, it is absolutely blind.

*“Trees outstrip most people in the extent and depth of their work for the public good."*
- Sara Ebenreck

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**Links:**

The value of mature trees in carbon sequestration:

<http://www.nature.com/nature/journal/v507/n7490/full/nature12914.html>

Chadwick Arboretum at Ohio State University, <https://chadwickarboretum.osu.edu/research-and-education/why-trees-matter> )

The cooling effects of trees:

<https://carnegiescience.edu/news/water-evaporated-trees-cools-global-climate>

<https://phys.org/news/2017-03-forests-global-ways-important-previously.html>

People planting thousands, even millions of trees:

the Billion Tree Campaign at <https://en.wikipedia.org/wiki/Billion_Tree_Campaign>

Deaths due to heat:

 <https://health2016.globalchange.gov/temperature-related-death-and-illness>

Ecological services performed by trees, article by Jim Robbins:

<https://www.nytimes.com/2012/04/12/opinion/why-trees-matter.html>

Phytoremediation: <https://en.wikipedia.org/wiki/Phytoremediation>

Benefits of trees: <https://treecanada.ca/resources/benefits-of-trees/>

and Green Cities: Good Health website: <https://depts.washington.edu/hhwb/>