

## Growing Trees in cities is like Planting Healthy Air

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The first thing that one sees when a flight approaches New Delhi is thick smog that envelopes the city and the lack of greenery. In almost all other major cities in India lack of greenery is the most obvious sight that one sees when approaching that city by air.

The sorry state of [Delhi's air has recently been in the news](#). I feel that planting trees on a large scale in cities is one of the best solutions to air pollution.

Large body of data on the beneficial effects of trees has been published world-over. It has been shown that trees [are excellent in capturing harmful particulate matter \(PM\) of 2.5 to 10 micron \(micrometer\) size](#). These particulates are mostly produced from automobile exhausts and from burning biomass. When inhaled, [the 2.5 PM particles can also go directly to the brain](#) and can cause various ailments including cancer while PM 2.5 to 10 particles cause asthma and various other lung diseases. There are guestimates (since the numbers are speculative) that [3 million deaths per year world-over are due to inhalation of this particulate matter](#).

Trees capture these particles quite effectively in the following way. The waxy surface of leaves and their random orientation help in capturing them. Also the [leaves are positively charged](#) and hence attract the [negatively charged 2.5-10 PM particles](#). All these three mechanisms make a tree an excellent particulate remover. This was corroborated by a [2016 study at University of Exeter in UK](#) where researchers found that more trees in urban neighborhoods correlated with a lower incidence of asthma.



Researchers have also discovered that if about 20-30% of city area is covered by trees then it can [reduce the particulate pollution by almost 24%](#) ! In most Indian cities tree cover is between 7-15% and hence there is a need to increase it. Besides reducing air pollution trees also make-up the planet's heat shield. They keep the concrete and asphalt of cities and suburbs 4-5°C or more degrees cooler and protect our

skin from the sun's harsh UV rays. Tree cover also reduces tremendously the air conditioning load of buildings.

Though the leaves of every type of tree catches the pollutants, one of [the best catchers are conifer trees \(pines or those with needle-like leaves\)](#). They are also evergreens (do not shed their leaves during winter) and have shown to have the highest efficiency in catching particulates and dust. Thus there should be a healthy mix of evergreens in the tree selection for planting.

The efficiency of particulate capture reduces when the leaves are covered with dust and oil from the vehicular pollution. However a single rain shower cleans them up and they become ready for the process of removing particulate pollutants. Besides trees can also be cleaned by ground-based high speed hoses. This is far better and cheaper than the artificial rain that some people have suggested for removing air pollution.

Trees have nurtured life since time immemorial. They are literally a bridge between heaven and earth. They take water and minerals from the soil through the roots, carbon dioxide from the atmosphere through their leaves and with the help of solar energy convert them into oxygen and food - the two fundamental ingredients of life. Without trees there would be no life on this planet earth.

Trees are also rain producers since the evaporation of water from their leaves changes the microenvironment and helps in rain precipitation. Increased rain can also reduce air pollution.

Trees also help clean the air and environment by reducing dust, reducing noise pollution, absorbing pollutants like carbon monoxide, sulphur dioxide, nitrogen dioxide, etc. and fighting soil erosion.

Couple of years ago the state highway in front of our house was widened. The noise of heavy machinery and the dust clouds produced by earthmovers were effectively dampened by layers of trees in our garden. Without trees, living in our house for those 3-4 months would have been hell.

Trees also release vast clouds of beneficial chemicals. On a large scale, some of these aerosols appear to help regulate the climate; others are anti-bacterial, anti-fungal and anti-viral.

Trees are nature's water filters, capable of cleaning up the most toxic wastes, including explosives, solvents and organic wastes, largely through a dense community of microbes around the tree's roots that clean water in exchange for nutrients, a process known as [phytoremediation](#).

If all the above services were to be provided by man-made machines then it would cost mankind about 4 trillion dollars per year (twice the size of Indian economy). [A recent study concluded that for city of Mumbai alone trees provide about 13 billion dollars' worth of ecosystem services](#). Thus trees and forests provide services which are nearly impossible to be provided by any other means.

In the old times there used to be a slogan for tree planting - Each one plant one. I think it should be revived and it is in the interest of every city dweller to plant trees. A simple method is to carry seeds of any tree variety in one's pocket and keep on throwing them around especially in the rainy season while walking near the roads and empty spaces in cities. With time some of them will germinate and grow. If each one of us does it then cities can become greener. However for this to happen it is necessary that the local governments (and forest departments) should make the seeds of various trees available to general public.

Also too often the tree litter is burnt in most cities and towns which further increase the city's air pollution. All leaf and other tree litter should be composted to further enrich the soil for more trees to grow.

Besides cleaning the atmosphere physically, trees also act as spiritual antennas. Gautam Buddha, Ramakrishna and other saints achieved enlightenment under a tree. It is said that even Newton got his idea of universal gravitation when an apple fell from the tree under which he was sitting. History is full of examples on how [some of the great thinkers got their ideas while taking long walks in the woods.](#)

In Japan, researchers have long studied what [they call "forest bathing"](#). A walk in the woods reduces the level of stress chemicals in the body and increases natural killer cells in the immune system, which fight tumors and viruses. Studies in inner cities show that anxiety, depression and even crime are lower in a landscaped environment.



Having lived for last 40 years in an environment - both my house and [our Institute NARI](#) is surrounded by lots of trees; I can vouch for their beneficial effects. Trees provide balm to eyes, green lungs to my surroundings and solace to the soul.

[HOME](#)

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*All photos are from Internet*