

Nurture Greenery to Combat Pollution Woes

Urban areas suffer from 'heat island' effect due to the absorption of solar radiation by roads and buildings and the storage of this heat in the building material and its subsequent re-radiation. Plant surfaces do not rise more than 4–5 °C above the ambient and are often cooler



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As a part of the Swachh Bharat campaign, the National Air Quality Index portal produces an Air Quality Index (AQI) value for around 15 cities since April 2015. The values are based on the most prominent pollutant at that time for that city.

The monitoring stations measure the concentration of six different pollutants – PM2.5 (particulate matter of diameter less than 2.5 micrometers), PM10, sulphur dioxide, nitrogen dioxide, carbon monoxide and ozone. The end of year results show Southern cities fairsing generally better, but all of this is subject to change after the Bhogi festival. The festival celebrates the upcoming harvest and spring season by symbolically 'burning' the old and welcoming the new. However in recent years the levels of pollution have sky-rocketed due to the tyres being thrown into the fires for fuel and this phenomenon has been linked to several health issues.

Burning tyres emits a toxic cocktail- hundreds of different pollutants including a number of small particles that settle deep in the lungs are released. Fine particulates are significantly more hazardous to human

health than larger particulates. Tyres are not designed to be burned as a fuel and contain hazardous ingredients (including benzene and butadiene, both suspected human carcinogens).

The usage of green plants to combat air pollution can greatly reduce the levels of microscopic particulate matter (PM). Plants and trees are also effective filters for nitrogen dioxide, which is commonly found on city streets. While this may seem like an obvious suggestion — we have always understood the benefit of having landscape surroundings — there are new studies from around the world pegging the improvement in PM by 60% by placing green elements in urban landscapes.

The usage of trees for purifying air has been well documented with the first list of air-filtering plants compiled by NASA as part of a clean air study published in 1989. As well as absorbing carbon dioxide and releasing oxygen, as all plants do, the plants species that eliminate significant amounts of benzene, formaldehyde and trichloroethylene were listed as part of the study. The list covers a number of different ivy species which then leads one to think further — what if we can get better air purifying capabilities from hav-

ing green walls and vertical surfaces rather than the usage of the traditional avenue of planted trees?

Green walls are found most often in urban environments. They often contain a soil medium for the roots of the plant and have a system of water supply. They are however rather difficult to maintain past a certain scale. The alternative a green façade — wherein the plants are grown from the soil below and the wall is just used as a vertical support for the plant to climb onto is a more reasonable approach to having a vertical green surface. Many of the species of ivy are considered invasive species and need to be carefully tended.

Green facades reduce the overall temperatures of the building. Urban areas suffer from the 'heat island' effect due to the absorption of solar radiation by roads and buildings and the storage of this heat in the building material and its subsequent re-radiation. Plant surfaces, as a result of transpiration, do not rise more than 4–5 °C above the ambient and are sometimes cooler. Living walls are particularly suitable for cityscapes, as they allow good use of available vertical surface areas.

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