Air quality can play a significant role in the well being of people living in cities. New research suggests that planting vegetation on rooftops to make ‘green roofs’ could substantially reduce the impact of urban air pollution, thus enhancing city life.

People in cities are exposed to high levels of pollutants, which adversely affect human health. For example, ground-level ozone is a major constituent of smog, which can develop during hot summers. Vulnerable people, including children, the elderly and those with heart and respiratory conditions are especially at risk and long-term or chronic exposure to air pollution for people with asthma is of particular concern.

Previous research has shown the benefits of using natural vegetation to improve the quality of life for people living in urban areas. Advantages include providing shade for buildings, lowering the ambient air temperature in hot weather (which reduces the incidence of smog) and reducing the concentrations of atmospheric pollutants. Green plants act as filters of gaseous contaminants and sticky leaves can remove particulate matter (PM) from the air.

Canadian researchers investigated the effect of vegetation, particularly the use of green roofs, to reduce levels of air contaminants in an urban environment. The study measured the impact of various combinations of green walls (walls which support plants growing upright), green roofs, trees and shrubs on improving air quality in an area of Toronto. ‘Intensive green roofs’ support trees and shrubs, while ‘extensive green roofs’ support lighter plants such as grasses. The study suggests that:

- trees are the most effective means of removing contaminants from the air
- trees and shrubs are more efficient at reducing contaminants than green walls or green roofs
- shrubs, green walls and green roofs can be used to support the use of existing trees in lowering air pollution
- installing shrubs on roofs (intensive green roofs) would have a significant impact on reducing contaminants from the air
- placing grass on roofs (extensive green roofs) had less of an impact than the use of shrubs, but could complement the use of other vegetation
- in high-density areas, where there is little room for trees, the use of shrubs and intensive green roofs is the most cost effective option

As it is not practical to place extensive tree cover on city roofs, researchers suggest that increasing the surface area of roofs with grass (extensive green roofs) is an effective alternative for significantly reducing the impact of urban air pollution. A 10-20 per cent increase in green roof area would make a substantial contribution to improving air quality in cities.

Researchers suggest policy planners could use green roofs in conjunction with existing vegetation to meet air quality standards across suburban and city levels, especially in areas with compact urban densities.


Contact: bethanne@hurontel.on.ca

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