

Trees? Yes Please!

Key Findings of Bringing Vertical Forests to Urban Spaces

- ⇒ Trees are a natural and cost-effective combatant to environmental and social concerns.
- ⇒ Vertical forests are a solution to greenifying limited available urban space.
- ⇒ City governments need to implement legislation that demands higher ratios of new development to green space-- benefitting the growth, livelihood, and sustainability of cities.

Problems Facing Urban Environments

Environmental concerns have been historically pushed to the side, especially in times of rapid urbanization. Increased population density and industrialization lead to decreases in air and life quality in urban settings. Now, more than 80% of people in urban areas are exposed to air quality levels that exceed limits set by the World Health Organization⁽⁶⁾. As these densely-populated areas continue to environmentally decay, it is becoming abundantly clear that city governments, urban planners, and policy makers need to start prioritizing natural green spaces in cityscapes on both a local and global level.

BENEFITS OF TREES IN URBAN SPACES

AIR QUALITY & HEALTH - Trees absorb odors and pollutant gases (nitrogen oxides, ammonia, sulfur dioxide and ozone) and filter particulates out of the air by trapping them on their leaves and bark. In doing so, trees improve the ability to breathe and overall health of urban residents. Research shows that within minutes of being surrounded by trees, blood pressure drops and stress reduces⁽⁵⁾.

TEMPERATURE - Trees reduce wind speeds and cool the air as they lose moisture and reflect heat upwards from their leaves. Parts of cities without cooling shade from trees can become "heat islands." It's estimated that trees can reduce the temperature in a city by up to 10°F by shading homes and streets and breaking up heat islands⁽⁵⁾.

WATER - Because cities are covered in concrete, heavy rains cause sewer system overflows and runoff that can carry garbage into local waterways. Green spaces catch and use that water, lessening the burden of rain on city infrastructure and critically aiding water crisis prevention.

PROPERTY VALUE - People are attracted to live, work and invest in green surroundings. Research shows that average house prices are 5-18% higher when properties are close to mature trees. Additionally, the more trees and landscaping a business district has, the more business will flow in⁽⁵⁾.

ECONOMY - According to the USDA Forest Service, "Trees properly placed around buildings can reduce air conditioning needs by 30% and save 20-50 percent in energy used for heating"⁽⁵⁾. Reducing the energy demand for cooling houses reduces carbon dioxide emissions as well as saves money on electric bills.

AMBIANCE- Trees are both beautiful and majestic. Different species display a seemingly endless variety of shapes, forms, textures and vibrant colors. The strength, long lifespan and regal stature of trees give them a monument-like quality. Most react to the presence of trees with a pleasant, relaxed, comfortable feeling. In addition, trees can mask concrete walls or parking lots, and unsightly views. Additionally, the foliage can muffle urban noise almost as effectively as stone walls: when planted at strategic points in a neighborhood, it can abate major noises.

COMMUNITY & SOCIAL VALUE - Trees can strengthen the distinctive character of a neighborhood and encourage local pride. They increase quality of life by bringing natural elements and wildlife into urban spaces. Communities can gather under their shade during outdoor activities with family and friends.

SAFETY - Neighborhoods and homes that lack trees and greenspaces have shown to have a greater incidence of violence in and out of the home than their greener counterparts⁽⁵⁾.



BENEFITTING FROM VERTICAL FORESTS

In city planning, there has been a dilemma balancing the desire for parks and green space and needing area for new developments to sustain the ever-growing urban populations. Vertical forests are the perfect way to integrate the residential and commercial space of high-rise buildings with vital greenery. Vertical forests are succeeding all around the globe including Bosco Verticale in Milan, hosting 1100 trees from 23 local species and 2500 cascading plants and shrubs, which are predicted to provide 25 tons of CO₂ absorption each year and produce about 60 kg of oxygen a day. That is far more greenery than could be supported by the building's footprint alone in addition to being equipped with solar panels and a complex integrated gray-water recycling and irrigation system that redirects water used by residents to sustain the structure's plant life. "It is a model of vertical densification of nature within the city that operates in relation to policies for reforestation and naturalization of large urban and metropolitan borders," according to project architect Stefano Boeri⁽¹⁾.

IMPLEMENTING VERTICAL FORESTS

So, if trees are so great, why isn't everyone implementing vertical forests? Upfront, the costs of designing and building a vertical forest are greater than an ordinary structure. However, after the initial investment, the building will cost less to heat, power, and maintain. These types of large real estate investments can change the property value of a neighborhood. Similar to The High Line in New York City, while not a vertical forest, creating new green space can cause ecological gentrification, both locally and globally, that can take place after the implementation of such dramatic greenery and architecture⁽²⁾. The question is: is it worthwhile to save a city's sustainability and infrastructure for future generations if it's driving out the existing ones?

Preventing this requires careful policy planning to maintain the integrity of vertical forests and the neighborhoods they are built in. Policymakers should

1. Subsidize development of structures with over 20% green surface area cover (AKA vertical forests).
2. Additionally subsidize 10-30% of low-income housing in the region of development to protect residents from being priced out of their homes and neighborhoods.

These subsidies will encourage developers to invest in vertical forests, subsequently jump-starting the local and global economy with the increasing popularity of sustainable, green infrastructure development.

SOURCES

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