

.Green walls.

Definition

Green walls are vertical structures that have different types of plants or other greenery attached to them. The greenery is often planted in a growth medium consisting of soil, stone, or water. Green walls differ from facades, which are often seen climbing up the outside walls of buildings, using them as structural support. In green walls, the growth medium is on the surface or structure of the wall, whereas facades are rooted in the ground.

Maintenance of green walls

The higher the wall, the trickier it gets to maintain it. In loose and structural media solutions, replacing plants is generally straightforward. In mat media systems however, replacing plant matter is more problematic: lost sections often have to be cut off. Removing these sections may cause extra plant loss due to greenery having spread their roots into the removed area. Moreover, water is vital for the survival of the plants, which is why most plant walls have integrated irrigation systems to make it easier to take care of the plants. The plants also need basic nutrients, which are usually received through irrigation. The irrigation systems are typically either recirculating or direct systems. A recirculating system circulates the water, pumping and distributing it from a built-in tank. Meanwhile, a direct irrigation system gets the water from an external water source. Whereas recirculating systems collect excess water for reuse, direct systems send the excess water to a sewer drain. For a green wall to function as it should, all of its mechanisms need to work properly.

Applications of Green walls

Green walls can be an opportunity to contextualize urban design contents and strategies, moving into the direction of integration and sustainability of all city elements, such as buildings, public spaces and greenery. The scientific research on green walls systems and their benefits in the environment of the cities is still in the development stage. The most common knowledge about the applications in this field is associated with new or existing buildings, which are seen as landmarks in the urban fabric. It is interesting how green walls have been rarely used as elements of urban design, and urban fabric composition, either in new urbanizations or in the rehabilitation of historical places. As shown by the presented examples, their use can play a decisive role in the composition of the city's shape and in the qualification of the urban image, in matters such as the regularization of different buildings heights and alignments, in the camouflage of blank walls or in the qualification of small places.

Effect of green walls on humidity and temperature:

When plants transpire, they become miniature humidifiers. Green walls often have an advantage of higher humidity due to many plants together in close proximity. Green walls also reduce the 'urban heat island' effect in cities. They also act as insulation helping to regulate a building's temperature, keeping it warmer in Winter and cooler in Summer.

Effect of green walls on air pollution:

In a new study, a team took a closer look at a common feature of the urban landscape: the street canyon. Street canyons are roads surrounded by tall buildings, where air tends to linger.

The researchers ran computer simulations to determine how green walls might affect pollutant concentrations at street level. Adding plants to walls would cut nitrogen dioxide levels by 15 percent and small particulate matter by 23 percent, the authors estimate. In areas with little wind, those numbers could reach 40 and 60 percent.

Trees also help reduce air pollution and clean the air, but they can keep street-level air from mixing with the air above. At low-to-medium pollutant levels, planting trees will still reduce air pollution, the team predicts. If a city is very polluted, however, trees could actually increase nitrogen dioxide levels near the street.

The advantages and disadvantages

Everything has a negative and positive side and is the same for the Green Walls. The green walls have a lot of advantages but also some disadvantages .

Advantages:

- ***That you can save space***
 - ➔ nowadays most of us do not have outdoor spaces to go for a garden, people are living in an apartment and could give only a limited area of their balcony for gardening, and hence they should be very creative to use it at its maximum.
 - A vertical garden uses a very limited space for planting, you can have piles of plant vertically arranged one by one or hanging one above the other. You just need to take care that the plants are getting proper sunlight.
- ***Keeping your Diversity of plants:***
 - ➔ You can even experiment with growing diversity of plants like decorative and vegetable plants row by row to give aesthetic to the garden. Comparatively the vertical garden is easier to grow and maintain as well.
- ***It's a protective shield:***
 - ➔ Everybody knows that plants absorbs pollutants and harmful compounds, so when we grow plants vertically in compact way, it acts as a protective shield and gives you a pure environment to breath in.
- ***It insulates your building:***
 - ➔ Your green walls do not only absorb the air pollutant but also the heat, noise, harsh weather and UV rays. It regulates temperature through transpiration and gives you cooling.
- ***A healthy vegetation:***
 - ➔ In vertical gardening the plan gets more exposure of sunlight and air circulation as it grows upwards, which results in a healthy garden.
- ***The plants even help to reduce stress:***
 - ➔ Many studies have found the Physiological effect of Plants in reducing the physical signs of stress and promote access to vegetation for having a greater positive human health impact.

- ***It's aesthetically pleasing:***
 - ➔ You can incredibly transform the wall or any empty space into something aesthetically pleasing and creatively stimulating by vertical gardening. It can be used in making green wall, or gate decoration, or hangings basket or window boxers, whatever it may be it gives a soothing natural beauty and makes a great impact on the visualize. These helps you to turn your apartment into a luxury villas which you always desire for.

Disadvantages:

- ***Cost:***
 - ➔ Green walls are a luxury item costing between \$900 - \$1,500 per square meter, however the new systems take a lot of the hard work out of the construction of green walls thus decreasing installation costs.
- ***Maintenance:***
 - ➔ Green walls are very labour intensive to maintain - usually you have an average of 50 plants per square metre. Keeping soil intact on a vertical living system looks easy, but in reality cleaning up the soil that falls out daily because your plants are growing is a labour of love. You will also need to regularly replace plants that have died or are root bound.