



Vertical Gardening: A New Landscape Concept for Urban Spaces

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With urbanization, people are shifting from rural to urban areas, thereby, urban population is increasing day by day resulting in congested cities and towns. In the urban regions, numerous new buildings are being constructed, leaving very little space for the green. Loss of agricultural land is a common result of urban area expansion to accommodate growing population. The gradual replacement of green areas in metropolitan areas with concrete surfaces has raised the temperature and contributed to global warming. Because urban surfaces like asphalt or concrete collect more heat from solar radiation during the day and radiate it out at night, the ambient temperature in metropolitan regions can be up to 6°C higher than in rural regions. As a result, compared to its rural surroundings, the city has greater daytime highs and lower nighttime lows. With an increasing population, urban air, water, and noise pollution are also serious problems. To lessen these consequences, we need an inventive approach to manage space and alleviate these problems causing degradation of environment. The significance of vertical planting is now revealed.

What is Vertical Garden?

Vertical gardening is a modern concept of gardening in which plants are grown in vertical spaces rather than growing horizontally. This method of gardening doesn't require soil and can accommodate large number of plants with in a minute space. It is a creative way of landscaping. Vertical gardens are also referred as Green wall, Living wall or Bio walls. Green wall can be created by two ways, one is by establishing green facade of climbing plants either growing directly on a wall or on a specially designed structure. In green façade the plant shoot system grows up on the building while being rooted to the ground. Other is by creating living walls comprised of polypropylene plastic containers, geotextiles, irrigation systems, a growing soilless media (Vermiculite, Perlite, Cocopeat etc.) and vegetation.

Maintenance of vertical garden:

1. **Weeding:** Manual weeding is feasible way of weeding in vertical gardening.
2. **Replant:** Timely replace dead and damaged plants with healthy plants.
3. **Watering:** A gravity-drip system is the most typical method of watering a vertical garden. It also reduces water waste significantly.
4. **Mulching:** Add mulch to the growing media. It will save water from evaporating very quickly.

Benefits of vertical gardening:

- Indoor vertical garden act as an element of home decoration.
- Can grow more plants in less space.
- In areas with degraded soil it becomes feasible to grow plants using concept of vertical gardening.

- Weeds are not a major problem as the media used is sterilized and is free from weed seeds. So, management of vertical gardens is easy.
- A vertical garden creates micro-climate as it reduces air pollution, dust, and direct impact of scorching rays from the sun by providing shade and insulation.
- Hospital patients with natural views require less medication and attention and can be discharged sooner.
- It improves air quality by absorbing harmful VOC's (Volatile Organic Compounds) from the atmosphere and hence, creating clean air rich in oxygen.
- Both interior and exterior greenwalls can absorb sound which reduces noise inside the building.
- Less labour requirement for management

Drawbacks of vertical gardening

- High initial cost of establishment.
- High cost of media and irrigation system used.
- Limited number of plants can be grown economically.
- Skilled labour is required for its management.
- People in rural areas are not aware about it.

Components of vertical gardening:

The components of most vertical planting systems include:

1. A structural support system
2. Plants
3. A panel system to contain the roots and soilless growing media
4. An integrated drip irrigation system and catch basin to control runoff water
5. Waterproof Barrier
6. Lighting

Plants suitable for vertical garden

S.No.	Foliage plants	Flowering plants
1.	Sword fern (<i>Nephrolepis exaltata</i>)	Geranium (<i>Geranium dissectum</i>)
2.	Golden pothos or money plant (<i>Epipremnum aureum</i>)	Wedding vines (<i>Stephanotis floribunda</i>)
3.	Dracaena (<i>Dracaena sp.</i>)	Star jasmine (<i>Trachelospermum jasminoides</i>)
4.	English Ivy (<i>Hedera helix</i>)	English Lavender (<i>Lavandula</i>)
5.	Philodendron (<i>Philodendron erubescens</i>)	Wisteria (<i>Wisteria chinensis</i>)
6.	Succulents	Clematis (<i>Clematis alias</i>)
7.	Wandering Jew (<i>Tradescantia zebrina</i>)	
8.	Arrowhead Plant (<i>Syngonium podophyllum</i>)	
9.	Hosta (<i>Hosta sp.</i>)	
10.	Honeysuckle (<i>Lonicera periclymenum</i>)	

Other applications of vertical gardening:

- Can adopt this technology to grow fruits and vegetables to beat erratic weather
- Fruits and vegetables are the most popular plants grown in the vertical gardens. Strawberries, tomatoes, traditional vegetables and collard greens are most commonly grown crops in vertical garden.

- With a vertical gardening system, the same area can house more than twice as many plants when compared to greenhouse.

Conclusion

Vertical gardening is a reliable and sustainable way of landscaping having expressive and artistic qualities. It saves natural resources like water, air and soil. Vertical gardens serve not only the purpose of oxygenating the environment but create an aesthetically pleasing view. Vertical gardening gives you the chance to make the most of your small spaces and add as much green space as you can in this age of global warming.