

Revolutionizing Urban Agriculture: Vertical Gardening for Sustainable Living

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Due to overpopulation in cities, excessive use of chemicals on crops poses health risks. To combat this, urban residents are turning to establish and maintain small home gardens, even utilizing limited spaces like balconies.

Recognizing the significance of home gardens, people are exploring alternatives like terrace gardening and vertical gardening when space is scarce. Indian Institute of Horticultural Research located at Bengaluru has developed a model vertical system namely Arka Vegetable Garden Structure for growing vegetables, flowers, and herbs in small urban spaces.

This vertical system is designed for apartment-type houses, creating a balcony-like space for growing plants. It comprises three parts: a base, a middle frame

dimensions tailored to their growth. The setup accommodates a variety of vegetables, greens, and herbs.

In a vertical garden, different tiers allow the cultivation of various plants. The top tier is suitable for flowers like marigolds and China aster, while the lower tiers are ideal for vegetables and herbs of varying heights.

To facilitate irrigation, a 25-liter tank is positioned at the top of the vertical system, with pipes distributing water to all levels. The entire system weighs 40 kg, including plants and growing medium, enabling efficient cultivation in limited urban space.

The vertical garden structure is useful for safe growing of the selected vegetable requirement of a family and can be accommodated in sunlit utility area, balcony and terrace. This structure can also be used by anyone who desires to grow vegetables, medicinal and flower crops using vertical space. Pots suitable for growing different vegetables, flowers and medicinal plants can be used with soil or soilless (cocopeat) growing medium.

The advantages of this vertical structure are

- i) Can be accommodated in floor area of one square meter,
- ii) Fresh vegetables grown can be consumed,
- iii) Different sizes of plant pots/grow bags can be accommodated,
- iv) Consumer also controls the use of fertilizer, pesticide and inspective to its safe limit and he also knows what he consumes,



with supports for holding pots, and a structure for tank placement. The system is movable, allowing easy adjustment.

The vertical garden system offers flexibility in plant placement. Plants are grown in bags or bins with

- v) Structure suitable for handling in terms of height of reach, mobility, requirement light available to all the pots and
- vi) Effective utilization of maximum area for growing plants.

Plants like tomato (pot size- 16" dia. and 12" height), chilli, brinjal, French bean, peas etc., (pot size- 12" dia. and 10" height) which need bigger size pot, grow to a height about 2 feet and require more growing media are placed at the base of the structure.

Leafy vegetables like amaranthus, coriander, palak etc., (pot size- 26" x 8" x 6" (LxWxH)) and medicinal plants like brahmi, pudina, pepper mint, thippili, ashwagandha, shatavari etc., (pots size -14" x 8" x 6" (LxWxH)) are placed upper levels. A 25 litre plastic container at the top of the structure with necessary drip laterals, microtubes and drippers are also provided to water the plants. Yield of 2 kg to 5 kg of produce (depending on the crop) can be harvested per crop cycle. The cost of vertical garden structure is approximately Rs. 22,000.

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