

## Horticulture in Urban Areas: A Venture Beyond Landscaping and Crop Production During COVID-19 Pandemic

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Urban horticulture has been popular for quite long time for creating and maintaining greenery in ever-expanding cities. Landscaping has been an integral part of the urban development. Apart from gardens and parks located in cities and towns, growing shrubs and trees as avenue plants has been popular in many urban areas. These plants have not only provided aesthetic appeal to cities but have immensely contributed in controlling air and noise pollution in these areas (Renterghem *et al.*, 2014). There is no need to reiterate the importance of these plants for existence of insects, birds and other small creatures including microfauna (Tresch *et al.*, 2019).

In recent past, vertical growing of ornamental plants is being employed for beautifying the walls of hotels, airports, commercial buildings, residential complexes, recreation areas *etc.* These green walls have transformed some of the concrete jungles into mesmerizing locations with soothing effects. Mere sight of such green areas could have positive impact on our behavior and could help in reducing stress to a great extent. Hence, most of the city dwellers have been attempting to grow ornamental plants, vegetables, herbs *etc.* in their little spaces available in balconies, terraces and backyards.

During the lockdown due to COVID-19 pandemic, a number of city dwellers have ventured into crop husbandry as a recreational activity. This could be easily understood by the sudden surge in the number of amateur videos and articles available on online platforms about gardening. Easy availability of most of the gardening inputs on online commerce sites has also given impetus for this activity. However, considering potential of various horticultural crops in improving immunity for fighting against infections, the urban spaces could be utilized more wisely to make them useful for household consumption as well earning profits from them.

In general, definition of horticulture encompasses all the aspects of crop production, landscaping, crop improvement, crop protection, value addition including marketing and economics of garden crops. However, most of the times, landscape gardening is widely highlighted part of urban horticulture, while other aspects have received limited attention. By diversifying the uses of available urban spaces towards such activities, additional income could be obtained. Few such avenues of income generation have been discussed hereunder.

### Planting material production of immunity boosting plants

A wide variety of immunity boosting plant species are grown in the home gardens based on consumer preferences, region of growing and availability of space and other inputs. Spices have been valued for their strong antioxidant and antimicrobial properties (Yashin *et al.*, 2017). Owing to this, formulations recommended by health agencies involve use of these species for preparation of decoction/ *kadha* for improving immunity ([www.ayush.gov.in](http://www.ayush.gov.in)). A large number of crops including herbs, aromatic and medicinal plants could be easily cultivated in the urban areas in pots and grow bags. Basil (*Ocimum* spp.), ginger (*Zingiber officinale*), turmeric (*Curcuma longa*), lemon grass (*Cymbopogon* spp.), mints (*Mentha* spp.), long pepper (*Piper longum*), aloe (*Aloe vera*), Indian bay leaf (*Cinnamom umtamala*), cilantro (*Coriandrum sativum*), mango ginger (*Curcuma amada*), Burmese coriander (*Eryngium foetidum*) *etc.* are some of the common plants, which could be easily cultivated for household culinary and primary healthcare uses.

A number of fruits have been known to be rich sources of nutrients, vitamins and minerals, thereby contributing to our immunity. Fruit species such as West Indian cherry (*Malpighia puniceifolia*), guava (*Psidium guajava*), lime

(*Citrus aurantifolia*) etc. are considered to be rich sources of vitamin C, while passion fruit (*Passiflora edulis*), Cape gooseberry (*Physalis peruviana*) etc. are rich in vitamin A. Owing to their ability to withstand crop management practices in potted conditions, they could be easily incorporated in the rooftop gardens and small balconies. However, availability of quality planting material is the crucial requirement for it.

With training on scientific propagation techniques, terraces could be used for multiplying such immunity boosting plants in considerable numbers and sold in the vicinity. For example, *Ocimum* species could be easily raised through seeds, while lemon grass could be multiplied in large number through seeds or slips from limited number of mother plants maintained in the pots. Long pepper, aloe, mints etc. could be easily multiplied through vegetative means. Black pepper (*Piper nigrum*) is a perennial vine crop, which could be cultivated in the form of bush pepper in pots (Bhattacharya *et al.*, 2018)

and could serve as a source of quality produce for the household. Production of bush pepper and selling of these plants at fruiting stage has been practiced in some cities in Southern India.

West Indian cherry, one of the richest sources of vitamin C in the plant kingdom (Anand *et al.*, 2018), fruits profusely 2-3 times a year. Having a couple of fruits each day could meet the recommended dietary intake of vitamin C for an adult. Sale of fruiting plants of West Indian cherry (Fig. 1), guava, strawberry etc. could fetch very good prices as the city dwellers tend to get attracted towards things which are 'ready to use'. Such species have very good potential for improving immunity. Other species could also be multiplied by creation of small shadenet house, polytunnels etc. on the rooftops. Inputs such as pro-trays, growing substrates, shade net, polybags, secateurs, gardening tools etc. could be easily obtained from local vendors or online shopping websites at affordable costs.



**Fig. 1: Fruiting plant of West Indian cherry ready for sale**

### **Intensive and semi intensive cultivation**

Though production of seasonal vegetables in urban and suburban areas has been practiced to certain extent, use of soilless farming including hydroponics has shown that crop cultivation could be made even more profitable. Most of these systems of cultivation require high initial investment and sound technical knowledge. However, with proper use of technology, good profits could be earned. Most of the R&D institutes and agriculture universities in the country are providing training on these

areas. Further, the manufacturers of such units also extend technical help to the growers. However, those who cannot afford establishing such structures can think of cultivating such crops on relatively smaller scale and semi intensive way.

For example, Burmese coriander is a lesser known herbal spice which fetches good prices in local markets of Andaman Islands and Northeastern states. During COVID-19 period, its prices in market of Port Blair increased to about Rs. 600-800/- per kg; however, during

other times also, the herb is sold at Rs. 300-500/- per kg. Considering this, ICAR-Central Island Agricultural Research Institute, Port Blair has developed multiple systems for cultivation of Burmese coriander.

CIARI- ProDhaniya (Waman and Bohra, 2020) is a novel method for cultivation of Burmese coriander in pro-trays (Fig. 2a) in which fifty plants could be accommodated in a small tray of less than two square feet size. At the end of crop cycle, about 500-600 g of fresh produce could be obtained from each tray. One can maintain a few trays for household purpose or could take

up large scale cultivation by accommodating more such trays on their rooftops. CIARI-ProDhaniya Multi (Fig. 2b) is another method for multi-tier cultivation of these pro-trays. In this system, Burmese coriander is grown in pro-trays which are arranged in vertical racks of variable size. This system is suitable for commercial production for supply to the markets and restaurateurs to meet their daily requirement of herb. Depending upon the space available, investment capacity and projected requirement, one can retain one or more such racks for production of this herb.



**Fig. 2: CIARI- ProDhaniya (a) and CIARI- ProDhaniya Multi (b) systems of Burmese coriander cultivation for urban gardening**

ICAR-Indian Institute of Horticultural Research, Bengaluru has also developed multi-tier system of cultivation of horticultural crops (Rathinakumari *et al.*, 2019). The unit is mobile and has provision for holding growing containers of various sizes. Location specific similar models could be developed in other regions as well.

Small-growing herbs such as lemon grass, mints *etc.* could be easily grown in pots as well as grow bags of wide dimensions of about 4-6 feet length. Such containers could be arranged in the open balconies and terraces for production of herbs. Being herbaceous perennials, these

plants could be regular sources of income with limited maintenance. Also, vines of passion fruit could be grown in large sized containers and trained on the nets. The species is quick growing, prolific bearing and fruits 2-3 times a year. Other high value immunity boosting species could also be cultivated in such manner to improve their availability in the markets.

### Primary processing

Species such as lemon grass, Indian bay leaf, basil *etc.* require proper drying for obtaining good quality produce. Such species could be cultivated in grow bags or pots and the produce could be hygienically dried on

the rooftop. Setting up of small scale mechanical dryers on the sheltered terraces could facilitate hygienic drying of the produce, thereby maintaining the quality of final product. Packaging of produce in proper packages/containers with informative labels could create awareness among the buyers about the importance of the species apart from enhancing shelf life of the quality produce.

### Value addition

The urban spaces could be utilized for preparation of value added products provided with hygienic conditions are maintained. A number of value added products could be prepared by using immunity boosting fruits, spices and medicinal plants. Such value added products can enhance the availability of seasonal produce during off season. For example, passion fruit is highly suitable for preparation of blended beverages. Blending of its juice with the spices/medicinal plants could help in improving palatability without compromising on the immunity boosting benefits they provide. Preparation of value added products such as dehydrated candy (ginger, aonla), pickles, herbal tea formulations *etc.* could be viable options under such processing units.

### Vermicompost

Most of the urban dwellers with a few plants in their balconies/ gardens require manures on regular basis. Vermicompost is one of the popular organic manure sources, which is widely utilized in production of various crops. Technique of preparation of compost using earthworms is simple and with limited investment one could establish own production unit in urban areas. Portable vermicomposting units are available in the markets at affordable cost which could be utilized for starting the venture. The nutrient content of the produce could be analyzed from reputed institutes and with complete information on the label the produce could be packed into small sized packets. It would facilitate its

marketing among the users, who are conscious about use of chemical inputs.

In a nutshell, in the COVID-19 era and thereafter as well, urban spaces could not only help the producers in getting good incomes from diversified avenues but would also help the consumers in getting immunity boosting produce for combating various infections.

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