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Nutritional security through production of vegetables under terrace garden

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Abstract

An On Farm Trial was conducted by Krishi Vigyan Kendra, Raipur during Kharif and Rabi 2017 – 18 on roof top of four houses/ residence at Jeevan Vihar Colony of District Raipur. Initially it was promoted through on Farm Trials, taken four urban women from Jeevan Vihar Colony of District Raipur into confidence. Improved variety seeds of short duration crops of vegetable, pot trays, grow bags, containers, vermi compost, Tricodermavirdie, cocopeat bricks, neem formulation etc. were provided to four householders. Training and demonstration regarding preparation of grow bags, Crop calendar for round the year. On the basis of this on Farm trial it was found that one unit of Terrace Garden provides 209 kg of fresh vegetable round the year with economic return of Rs.1930. This way terrace garden not only provided nutrition to urban families but also minimised their expenditure for vegetable purchasing.

Keywords: Terrace garden, on farm trial, demonstration, nutritional security, urban greening

Introduction

Terrace garden is garden created on the roof -top or Balcony. Besides decorative benefit, roof -top plantings may provide fresh vegetables and fruits and recreational opportunities. With the buildings on land and its cost in urban areas, there is scarcely any space for a garden. So if vegetables were to be grown domestically the only way is terrace which gives the ideal space (Nair *et al.*, 2015) [2]. It can be effective to provide healthy vegetable in populous nations like India. No much technology and modern briefings are required for establishing a terrace garden. Thus Terrace gardening can be shortcut for urban greening of any nation as well as in increasing horticultural crop yield. As the world is heading towards the depletion of natural resources and the loss of forest/garden area due to urbanization, there is a dire need of terrace gardens. When we cannot avoid utilizing open spaces on the ground for the construction of buildings and other utilities, then at least the open spaces available above these buildings can be utilized for plantations and gardens to minimize the ecological imbalance (Poornima Rao, 2016) [3]. There are many benefits of these terrace gardens, such as waste recycling, ecological benefits, energy conservation, water conservation, decorative enhancement of buildings and occupant's health benefits. Due to the fast / rapid urbanization and growing population, there is a big threat to food and nutritional security. One of the measures would be to have a terrace garden to utilize the available open space on top in a productive way. It serves many purposes, but one important purpose definitely served would be for those who have a passion for gardening. Terrace gardens also contribute tremendously towards the health betterment of the occupants. Vegetables purchased from the market is loaded with nutrients as well as pesticides and it loses its freshness when reaches kitchen but not the pesticide residues. Purchasing vegetables from door to door vendors is expensive. Moreover, fresh home grown vegetables taste is delicious and are good for health and safe from harmful chemicals. Nutrition is about all the aspects of food and how it is used in the body. Most people eat because they are hungry. However, while the feeling of hunger tells you to eat, it does not tell you what to eat. Food is made up of nutrients such as carbohydrates, fats, protein and micronutrients (vitamins and minerals). Nutrients are needed for energy (working and playing), for growth (building and maintaining the body) and for protection against infection. Green leafy vegetables such as pumpkin leaves and orange fruits are very rich sources of vitamins A and C for protection. The easiest way to get a variety of nutritious foods on a daily basis is from a terrace garden. Looking to importance of Terrace Garden establishment in urban area an on farm trial was conducted with the objective to provide daily nutritional needs for the family, Provide more income/saving in purchasing vegetables from market, Money, time and energy saving for

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women, productive use of terrace space, to make availability of fresh and pesticide free vegetables anytime, to create eco friendly environment without open land and to keep house cool.

Materials and Methods

Survey was done in Urban areas of Raipur District and problem identified in respect of Unavailability of organic /pesticide free fruits & Vegetables at household level and unawareness about income generating activity/ nutritional security through terrace gardening. Therefore, an On Farm Trial was conducted by Krishi Vigyan Kendra, Raipur during Kharif and Rabi 2017 – 18 on roof top of four houses/ residence at Jeevan Vihar Colony of District Raipur. Initially it was promoted through on Farm Trials, taken four urban women from Jeevan Vihar Colony of District Raipur into confidence. Improved variety seeds of short duration crops of vegetable, pot trays, grow bags, containers, vermi compost, Tricoderma viridie, cocopit bricks, neem formulation etc. were provided to four householders. Training and demonstration regarding preparation of grow bags, Crop calendar for round the year (Table No 1 and 2) availability of fresh vegetables in terrace garden, and plant protection measures were imparted to them time to time. Crop calendar was developed in such a way that it provides daily nutritional needs (Table No 3) for the family through the vegetables grown. Material used for the trial were grow bags of size 16x16 x30 cm (30 numbers), fibre containers of 2.5ft length, 1.9 ft.width and 8.5 inch depth (02 numbers), plastic pots of different sizes: 10 numbers, seeds of improved varieties of vegetables, materials for filling grow bags/ pots/ containers – Cocopit, vermicompost, soil in

ratio 1:3 each and plant protection measures: Tricoderma viridie and neem formulations

Terrace garden was planned in such a way that family had round the year availability of vegetables for whole family. vegetables like Brinjal, cauliflower, brocolli, green leafy vegetables, cowpea, bottlegourd, pumkin, okara, chillies, lettuce, tomato, bittergourd etc. were grown in terrace garden.

Table 1: Vegetables grown in containers

| SN | Kharif | Rabi | Summer |
|----|---------------------|-----------------------|---------------|
| 1 | Water Spinach | Water Spinach | Water Spinach |
| 2 | Corriander | Corriander | Corriander |
| 3 | Mint | Mint | Mint |
| 4 | Poi Bhaji | Poi Bhaji | Poi Bhaji |
| 5 | Chaulai | Palak | Kheda bhaji |
| 6 | Green garlic | Laal bhaji | Green garlic |
| 7 | Kharif onion | Methi | Onion bhaji |
| 8 | Kharif onion bhaaji | Green garlic | Ridge gourd |
| 9 | Early cauliflower | Onion (for bulb) | Smooth gourd |
| 10 | Tomato | Garlic (for bulb) | Bitter gourd |
| 11 | Chilli | Pea | Bottle gourd |
| 12 | Colocasia | Mid, late cauliflower | Pumpkin |

Table 2: Vegetables grown in grow bag and pots

| SN | Kharif | Rabi | Summer |
|----|-------------------|-------------|--------------|
| 1 | Okra | Tomato | Bitter gourd |
| 2 | Cluster bean | Okra | Bottle gourd |
| 3 | Brinjal | Brocolli | Okra |
| 4 | Early cauliflower | Cabbage | Ridge gourd |
| 5 | Chilli | Cauliflower | Smooth gourd |
| 6 | Tomato | Chilli | Pumpkin |

Table 3: Vegetables produced under terrace garden fulfils nutritional requirement of families

| Iron | Calcium | Vitamin A | Vitamin C |
|------------------|------------------|-------------------|---------------|
| Palak | Amaranthus | Chaulai | Palak |
| Lal Bhaji | Poi Bhaji | Methi | Mint Leaves |
| Chaulai | Brocolli | Lettuce leaves | Radish leaves |
| Brocolli | Spinach | Water Spinach | Brocolli |
| Water Spinach | Coriander leaves | Radish leaves | Amaranthus |
| Colocasia leaves | Tomato | Pumkin | cucumber |
| Bathua | Cabbage | Amaranthus leaves | Sweet potato |
| Fenugreek Leaves | Fenugreek Leaves | Mint leaves | Amaranthus |

Results and Discussions

Specially housewives of four families were involved in this study. Training cum demonstration on different aspects were given to them time to time. Vegetables have a host of health benefits. High in vitamins, minerals and fiber, they are critical to supporting optimal health. Although low in calories relative to other foods, vegetables contain a high percentage of carbohydrates. Green leafy vegetables or orange and yellow fruit and vegetables should be eaten every day. Most fruit and vegetables taste better and are more nutritious when they are fresh. small urban vegetable garden can be as beautiful as it is functional, especially if grow different type of vegetables.

Table 4: Performance of Terrace garden in urban area of District Raipur (2017-18)

| Production per unit (kg) | Cost of input (Rs) | Net Return (Rs) | Saving in Rs | BC ratio |
|--------------------------|--------------------|-----------------|--------------|----------|
| 209 | 2550 | 1930 | 4180 | 2.16 |

It was found that terrace garden fulfilled daily vegetables needs of the families. Per unit 209 kg vegetables was recorded. cost of cultivation per unit was Rs 2550. With net

return Rs 1930 (Table No 4). This way terrace garden not only provided nutrition to urban families but also minimised their expenditure for vegetable purchasing. similar findings are reported by Sharath Kumar M. (2012) ^[1], who started gardening during the last quarter of year2012 and has been growing quite number of vegetables on his terrace.

In general, better to choose large containers when growing plants for terrace garden because in large containers, plants grow more easily, better moisture conservation and nutrient supply and room for ample root development. The economics of trial conducted was Rs 1930 can be achieved per unit with BC ratio 2.16. Area covered 400 sq.ft roof top per family. Beneficiaries were 4 family in 2017 and 20 in 2018.

Best way to meet nutritional needs of family in urban areas and motivation to house wives towards nature/ eco friendly environment. Terrace gardening develops confidence in house wives to contribute some thing for their family. It provides pesticide free healthy and fresh vegetables in own houses. It also fulfils the per day requirement of fresh vegetables of the family throughout the year. Involvement of house wives in this activity not only empower them but also encourage their hidden creativity. In nutshell, food and nutrition along with

eco friendly environment within house premises/ top roof can be achieved by terrace gardening.

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