

Year Round Production of Vegetables in Kitchen Garden

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One of the easiest ways of ensuring access to a healthy diet that contains adequate macro- and micronutrients is to produce diverse kinds of foods in the kitchen garden. Kitchen gardens, also popularly known as home gardens, nutrition gardens or backyard garden are the areas either adjacent to the houses or slightly further away which are planted with diverse crop plant species of multiple utility and cultural significance providing households with direct access to vegetables that are not readily available or within the families' financial reach. Indigenous vegetables which are the cheapest source of vitamins and minerals, and are high value food source for poorest families can be well incorporated in the kitchen gardens.

Kitchen Garden technology- for nutrition security: Kitchen garden models based on vegetable crops rich in vitamin-A, protein, iron and iodine, which would supply the vegetables for the whole family throughout the year to ensure the nutrition security. The broad diversity of horticultural crop species allows year-round production, employment and income. Intensive horticulture can be practised on small plots, making efficient use of limited water, land resources and have a considerable yield potential to provide up to 50 kg of fresh produce per m² per year depending upon the technology applied. In addition, due to their short cycle they provide a quick to emergency needs for food and provide a quick return to meet a family's daily cash requirements. Leafy vegetables are particularly perishable and post-harvest losses can be reduced significantly when production is located close to consumers. No matter if they are urban or peri-urban, all gardens benefit from preplanning and design.

What are kitchen gardens? An area around the home where different vegetables and fruit are grown throughout the year to meet family nutritional requirements. **Or** The system of production of diverse crop plant species, which can be adjacent to household or slightly further away and is easily accessible **or** An intensive type of growing vegetables to minimize buying from the market and to provide continuous supply of fresh nutritious vegetables for the family”

Characteristics of kitchen gardens

Occupy a “small” area in the proximity to the home, Cultivation of diverse vegetables for year round availability, Production primarily for household consumption; surplus products sold at the markets in the centers of towns. Use of low-cost inputs and indigenous varieties; reducing dependence on exotic or imported varieties and management by members of household (wife, husband, children)

Kitchen Gardening is Great Physical Activity

Gardening can be a great, low-impact exercise. Doctors suggest 30-60 minutes of low to moderate intensity physical activity per day in order to maintain a healthy weight and for heart health. **Typical calories burnt (in adults) for 30 minutes of** Watering the lawn or garden – 61, Mowing the lawn (riding) – 101, Mowing (push mower with motor) – 182, Mowing (push mower) – 243, Trimming shrubs – 182, Raking – 162, Planting seedlings – 162, Planting trees – 182, Weeding – 182, Digging, spading, tilling – 202 and Hauling heavy rocks – 300

Mental, Emotional, and Social Well-being

For many people, the kitchen garden is an escape from stress and an ideal place for relaxation. It is the cheapest, healthiest, keenest pleasure one can get. Gives an opportunity for the family to work together and strengthen ties.

Types and Designs of Kitchen Gardens –

Cities have limited land therefore; vegetables have to be grown in a compact area or in the containers,

Between individual families: Some family may have choice of particular vegetable more others where as other families may have different choices. All these choices determine the designs and types of garden. One may decide to plant more of a particular variety to satisfy their taste regularly; where as other family may do other way round.

Family size also makes difference: large size family need bigger garden than small size, hence design has to be different between the two.

Planning a kitchen garden: Best locations for the kitchen gardens

Vegetables grow best where they receive the proper light, temperature, water and nutrients. When any one of these factors is limited the crop will also be limited in its growth and production.

Shape of the garden plot

Rectangular and square: more convenient to work and more easy to keep clean and neat. At least open on two ends Practice crop rotation to some extent within the limits of even the small vegetable garden, but much better, if possible, to rotate the entire garden-patch.

Climate: how where you live affects what you grow

The growing season is, essentially, the length of time an area can give plants the conditions they need to reach maturity and produce a crop. The length of the growing season totally dependent on the local climate. When you plant a vegetable depends on how well that vegetable handles extremes of temperature. The way a vegetable type reacts to climatic conditions —(temperatures, rainfall, sunlight and daylength) heat, cold, moisture, and so on — determines its "hardiness". The vegetables that are grown in a kitchen garden fall into one of four hardiness categories: *very hardy*, *hardy*, *tender*, and *very tender*.

Planning the kitchen garden: cropping systems and role of vegetables

The most suitable way is to plan according to the cropping systems: cool season and warm season vegetable planting areas.

- Cool season vegetables: require cool weather to grow and mature properly and can withstand frost, planted in early spring and again in autumn include peas, radish, cabbage, onion, carrots, potatoes
- Warm season vegetables: require warm weather to grow properly, planted after the soil has warmed up. Many warm-season crops also need a long growing season and so should be started indoors in early spring or purchased as seedlings ready to be transplanted.

A good option to reduce plant pest problems is to alternate cool and warm season areas of the kitchen garden each year.

Advantages of having a kitchen garden:

- Produces a steady supply of vegetables year round
- Vegetables can be harvested at optimum maturity and eaten or preserved while fresh
- Fresh vegetables are safe, higher in flavor, nutritive value and lower in cost than purchased vegetables which may also be full of pesticides
- Kitchen gardening provides healthful exercise and an interesting outdoor activity for the entire family
- Get a feeling of accomplishment, self-sufficiency and security

Different areas around a home have different characteristics: less moist or dry, shady under the trees, low land and highland with good sunlight. These areas can be used to grow different types of vegetables, thus ensuring a varied supply of vegetables throughout the year. Fruit vegetables like tomato, brinjal and okra, requiring full sunlight can be grown in exposed areas. Climbing vegetables including gourds, drought resistant vegetables including kangkong and legumes and shade loving vegetables like amaranth and other green leafy veggies can be grown close to the house, along the roadsides and under the shades of other trees.

Role of Nutrients from Kitchen Garden

Kitchen garden can serve as nutritional garden for family needs. A diversified kitchen garden with diverse species can contribute nutritional requirement, particularly, leafy vegetable rich in iron, vitamin A, vitamin C, vegetable protein, and dietary fiber. Moreover, food grown at kitchen garden is culturally preferred and valued for safe and fresh for home consumption. Kitchen gardening can be combined with neglected and under-utilised traditional crops for providing variety of food and fruits.

Fruits and vegetable groups actually vary widely in their nutrient contents. Dark, yellow or orange vegetables or fruits are good source of vitamin-A and Iron. Calcium and magnesium are extremely good at absorbing free radicals and they are essential for strong bones. To achieve this ratio would require eating a very large serving of high calcium greens with almost every meal. Balanced diets are not accessible for a large proportion of population, particularly those who live in rural areas. Many populations subsist on staple plant-based diets that often lack diversity (and also quantity and quantity), which may result in energy and deficiencies. Kitchen gardening can improve nutritional status more specifically on micronutrients status of women and children and poverty reduction, which is one of the appropriate food-based approaches, could be an essential part of the long-term global strategy to alleviate vitamin A and iron deficiencies but their real potential is still need to be explored. *Kitchen* gardening could be good source of healthy fruits and vegetables free from pesticides and fertilizers.

Implementing Kitchen Garden Design

The designed kitchen garden model on 6 x 6 m area each incorporates easy to grow, nutritious and indigenous vegetables. This area could be easily handled by household women and the produce could be consumed at least by a 4-member household. This area can be divided into five longitudinal blocks which were further sub-divided into 2-3 smaller sub-plots measuring 2x1, 3x1 and 1x1 m respectively depending upon the crop. Farmyard manure should be mixed in the plot area, sowing and transplanting of vegetable crops should be done

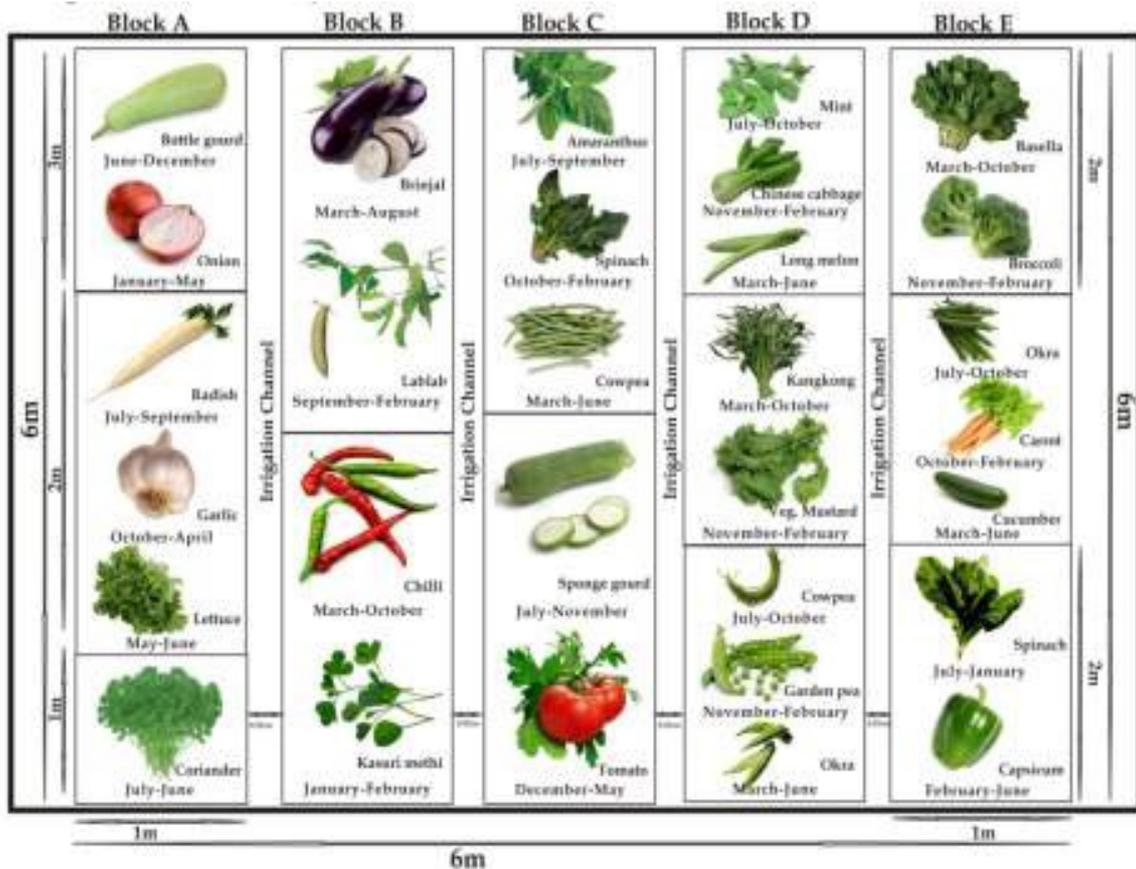
based on crop season and its duration. Fertilizers and management practices should be applied as recommended. The crop selection should be based on the location specificity, cropping seasons, nutritional availability, performance and family preference. In this model, 27 crops can be fitted into 13 cropping sequences for North India. (Fig. 1). The model is capable of producing 250-280 kg of fresh vegetable in a year.

Total edible yield: Vegetables can be harvested from kitchen gardens twice or thrice every week depending upon their stage of maturity starting The average weekly harvest (5.60 kg) providing average daily yields of 200 g per person in a four-member household under North Indian conditions. The 6 x 6m home garden designs for north India could significantly improve households' access to vegetables and is sufficient to meet the recommended levels in most times of the year.

Nutritional yield : The nutrient yield data suggested that while the 6 x 6 m vegetable gardens achieved supplies at recommended vegetable consumption level, vitamin A and vitamin C supplies were sufficient and continue to provide 100% - 500% of RDA, but protein and iron supplies were difficult to achieve (30% of RDA). High protein legumes and very high iron vegetables should be included in the garden designs to improve protein and iron supplies.

Fig. 1

<i>Plot number</i>	<i>First crop</i>	<i>Follow-up crop1</i>	<i>Follow-up crop 2</i>
1	Bottle gourd (Jun.-Dec.)	Onion (Jan- May)	-
2	Radish (Jul.- Sept.)	Garlic (Oct-Apr.)	Lettuce (May-Jun.)
3	Coriander (Jul.- Jun.)	-	-
4	Eggplant (Jul.-Dec.)	Lablab (Sept.-Feb.)	
5	Chilli (Mar.-Oct.)	Kasuri methi (Nov.-Feb.)	-
6	Amaranthus (Jul.-Sep.)	Spinach (Oct.-Feb.)	Cowpea (Mar.-Jun.)
7	Sponge gourd (Jul.-Nov.)	Tomato (Dec.-May)	-
8	Mint (Jul.-Oct.)	Chinese cabbage (Nov.-Feb.)	Long melon (Mar.-Jun.)
9	Kangkong (Mar.-Nov.)	Veg. mustard (Nov. Feb)	-
10	Cowpea (Jul.-Oct.)	Garden pea (Nov.-Feb.)	Okra (Mar.-Jun.)
11	Basella (Mar.-Oct.)	Broccoli (Nov.-Feb.)	-
12	Okra (Jul.-Oct.)	Carrot (Oct.-Feb.)	Cucumber (Mar.-Jun.)
13	Spinach (Jul.-Jan.)	Capsicum (Feb.-Jun.)	-



To summarize, kitchen gardens have a distinctive role to play in agriculture, food security, and nutrition. Kitchen gardens enrich local diets by supplementing staple crops with diverse, nutrient-rich vegetable crops; ensure a year-round supply of safe vegetables even when resources are scarce; conserve plant genetic resources and indigenous agricultural knowledge; provide income if adequately linked with markets; and, being located in the vicinity of the homestead, help women harmonize their farming and household tasks, thereby contributing to gender equality in agricultural production. Kitchen gardens may be an entry point to empower the community to manage on-farm agricultural biodiversity while promoting dietary diversity for healthier families and ecosystems. Indigenous vegetables, which are the cheapest source of vitamins and minerals and a high value food source for the poorest families, can be incorporated in kitchen gardens.

Apart from this, these gardens provide for a variety of quality of life variables, such as avoidance of stress, recreation, and personal and social identity. Growing fruits and vegetables seems overwhelming to most people, but it's actually much simpler than it sounds. All you need is a few square feet of the great outdoors, a water source, and a little time. Your grandparents did it, and so can you. If you still aren't convinced, consider these benefits of kitchen gardening which help **Improve your family's health; save money on groceries; reduce your environmental impact; get outdoor exercise; enjoy better-tasting food.; build a sense of pride; stop worrying about food safety and reduce food waste** When it's "yours," you will be less likely to take it for granted and more likely to eat it