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Promoting nutri gardening to improve nutrition: A promising approach

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Abstract

Vegetables are recognized as the most important source of micronutrients. Vegetable consumption can play an important role for eradicating micro-nutritional deficiencies. The inadequate supply of vegetables, particularly during the off-season, higher market price and lesser awareness regarding their consumption are key factors that limit the vegetable consumption rate in India. The per capita vegetable consumption in India (86 g/day) is far below the FAO's recommendation (200 g/day). One way to achieve this goal is through nutri-garden or kitchen garden. Home gardens are a part of agriculture and food production systems in many developing countries and are extensively used as an answer to ensure food and nutritional security in the circumstances of a global food crisis. Vegetable based nutri-gardening is important especially in rural areas where people have limited income-earning opportunities and poor access to markets. Nutritional kitchen gardens were developed on farmers' fields to combat malnutrition. Krishi Vigyan Kendra (KVK), Jabalpur, has made significant strides in promoting nutritional kitchen gardening in the villages of Sihoda, Tiwarikheda, Raipura, and Bardha of Jabalpur district. From 2016-17 to 2021-22, KVK conducted a total of 84 demonstrations across Kharif, Rabi, and summer seasons, covering an area of 2.1 hectares. The nutrient content of food significantly increased after the introduction of kitchen gardens. 2230 gm Vegetable availability (gm/day/family) were increased in during the year by using the planned kitchen garden, and \$2691 was earned each seasons as a result. The household's vegetable supply increased by 1460 gm Vegetable availability (gm/day/family). There was a 52.73 percent change in consumption for every day. Consuming more vegetables could help farm families combat malnutrition. Vegetable cultivation on the homestead contributes to household food security in addition to securing household nutritional security and income. These families were provided with seed kits as well as the scientific layout of the nutri-garden. While the average consumption of individual nutrients after Nutri Garden implementation showed the improved dietary diversity translated into better overall nutrient intake for farm families. Nutrition status is the condition of the body as it related to consumption and utilization of food. Improve nutrition status refers to the intake of balance amount of vegetables in diet, which supplies all the essential nutrients to meet the body's requirements.

Keywords: Nutri-garden, nutritional security, kitchen gardens, nutrition status, nutrient intake

Introduction

Vegetable based Nutri-garden is the richest source of nutrition and can play a vital role in eradicating under-nutrition. Nutri-garden is advanced form of kitchen garden in which vegetables are grown as a source of food and income in a more scientific way for small and marginal farmers. Nutri-garden can contribute to the family diet and provide several other benefits, specifically for farm families. This has led to introduction of nutri- gardens as they show a more clear-cut way from food production to nutritional outcomes. According to Indian Council of Medical Research (ICMR, 2010) recommendation for vegetable consumption can be fulfilled by 300 gm of vegetable per person per day in which 50 g leafy vegetable; 50 g root vegetables and 200 g other vegetables Preeti Mamgai (2021) ^[1].

Vegetable also provides taste, palatability, better digestibility to us and also increases our appetite. They can be easily grown in kitchen gardens or nutrition home gardens as short duration crops. The nutritional home or kitchen garden is generally located close to the house and is used for growing vegetables, fruits and other food crops for the domestic purpose and sale Jana (2015) ^[2]. Fruits and vegetables from the kitchen gardens are good source of micronutrients especially in the poor households. Rural areas have ample space and establishing a kitchen garden is far simpler as farm families are involved in agriculture ^[3]. Establishment of kitchen gardens has huge role in tackling the problem of malnutrition and micronutrients deficiencies in rural areas. Enhanced consumption of fruits and vegetables is the cheapest and easiest way to maintain good health.

Backyard kitchen gardening contributes to household food security by providing direct access to food that can be harvested, prepared and fed to family members, often on a daily basis Singh *et al.* (2021) [4]. Vegetables are recognized as the most important source of micronutrients. vegetable consumption can play an important role for eradicating micro-nutritional deficiencies and the inadequate supply of fresh and healthy vegetables around the year. Higher market price and lesser awareness regarding their consumption are key factors that limit the vegetable consumption rate in India. The per capita vegetable consumption in India (86 g/day) is far below the FAO's recommendation (200 g/day). One way to achieve this goal is through nutri-garden or kitchen garden. Kumari Shuba, (2020) [5] Despite increased awareness of the importance of vegetable consumption for health, it remains challenging to improve children's vegetable intake. Since food preferences are related to food intake, it is important to understand how they are shaped and which factors play a role in this. The main purpose of a nutrition garden is to provide the family with daily fresh vegetables which are rich in nutrients and energy. The rural people especially women of operational areas are severely malnourished along with multiple nutrient deficiency disorders due to ignorance towards importance of fruits and vegetables in their diets. Rural families sow seeds according to the crop plan in between rows of crops all around the year for their home consumption.

Vegetables are the powerhouses of our diets, brimming with Protein, vitamins, minerals, and fiber essential for good health. Yet, access to these vital nutrients often remains a challenge, particularly in farm families. Recognizing this crucial gap, ensures the availability of Krishi Vigyan Kendra, Jabalpur that has stepped up to empower the farm women with the knowledge and skills to cultivate their own kitchen garden. To assess the impact of these miniature nutritional havens, a study was conducted across five villages in the block. A hundred participants were randomly selected: fifty proudly tending their nutrition gardens, fifty representing the control group. Through interviews and surveys, the study delved into the impact of these gardens on household nutrition and food security.

Imagine a family's daily needs for essential vitamins and minerals magically sprouting in their own backyard. That's the essence of a nutrition garden. By systematically cultivating a diverse range of fruits and vegetables in a small, designated space, families gain year-round access to fresh, nutrient-rich produce. The study revealed that a plot of 250 square meters ideal for a family of 4-6 members. This space effectively utilized to grow vegetables from leafy greens, beans, cucurbits, tuber and other.

Materials and Methods

The present work was carried out the Front line demonstration on Nutritional kitchen garden in the villages namely Sihoda, Tiwarikheda, Raipura and Bharda of Jabalpur district during the year 2016-17 to 2021-22. Krishi Vigyan Kendra, Jabalpur were carried out a total of 84 demonstrations in both Kharif, Rabi and summer season in an area of 2.1 ha during the year 2016-17to 2021-22. During demonstration fourteen training programs were conducted in these villages with total female participants of 294. The objective of the training was to

upgrade the knowledge of rural women regarding the importance of the kitchen gardening and the technical aspects of its establishment. Pre and post knowledge data of trainees was collected with the help of an interview schedule. Data on their basic profile was collected which included the information regarding their Type of family, caste, education, income, category etc. During training programs, data on the major constraints for kitchen gardening was also collected. Aiming to boost both vegetable availability and household nutrition, this project empowered rural women by enhancing their knowledge of kitchen gardening. Through interactive demonstrations, participants gained valuable insights into the benefits and techniques of this practice. The focus was on overcoming common challenges identified by the women themselves, ensuring the project catered to their specific needs. Families of 4-6 members were chosen for targeted demonstrations, each utilizing a dedicated 250-square-meter plot to establish their own thriving kitchen gardens.

Area of the Nutritional garden

The area of the kitchen garden depends on the availability of the land, the members of family for whom vegetables are to be grown and the time that can be spared for its care. To meet the requirements of a 4-6 member family, an area of about 250 square meter land is sufficient. Therefore, backyard space may be utilized for growing of vegetables.

Plan and Layout

The nutritional garden for successful management of kitchen garden, planning is very essential. Layouts differ depending on the location, size, shape and slope of the land. Kitchen garden should be protected from all the sides. A simple bamboo protection will serve the purpose. The climbers like bean, snap beans, cucurbits, etc. can be grown on them the location of the plots, the crop to be grown, the probable dates of planting, spacing between the plants, the varieties of each crop to be used should be planned well in advance. The main aim in layout is the most economic utilization of space, which can be obtained by considering the following points: 12 Nutrition Intake through Nutritional Kitchen Garden Nutri-Guide, ICAR-ATARI, Jabalpur, Fence should be used for leafy, cucurbits, beans, tuber and other The ridges which separate the beds should be utilized for growing root crops. Vegetables like staked tomato may be grown on one side of the foot path and leafy vegetables on the other side. Crop rotation principles should be followed. Total Area 250 square meter (25 x 10 m).

Crops for the Nutritional garden: Crop selection for kitchen garden depends mainly upon the size of the garden and choice of the family. Only those vegetables should be grown which are suited to the region and produce satisfactory yield. If space is limited, only most preferred vegetables are grown which give better yield and nutrition per unit area. The cultivars should be selected according to the suitability of the region and as per time of sowing. Tomatoes, chillies, capsicum, radish, carrot, palak, fenugreek, pointed gourd, bitter gourd, cabbage, lettuce are desirable for small gardens. One should grow those vegetables in the kitchen garden in which freshness is of great importance as far as edible and food values are concerned.

Table 1: Vegetable’s availability according the seasons plan in Nutri Garden

Season	Green leafy	Root, bulb and tuber	Beans	Cucurbits and other vegetables
Kharif	Amaranth	Colocasia	Cowpea	Sponge gourd, Okra, Bottle gourd, Tomato, Brinjal, Bitter gourd
Rabi	Chickpea leaf, Spinach, Fenugreek, Coriander, Amaranthus	Carrot, Radish, Beetroot	French bean, Sem, Gram pods	Cauliflower, Cabbage, Tomato, Brinjal
Summer	Amaranth, Coriander	Radish	Cow pea	Okra, Chilli, Bottle gourd, Tomato, Brinjal, Pumpkin, sponge gourd, Bitter gourd

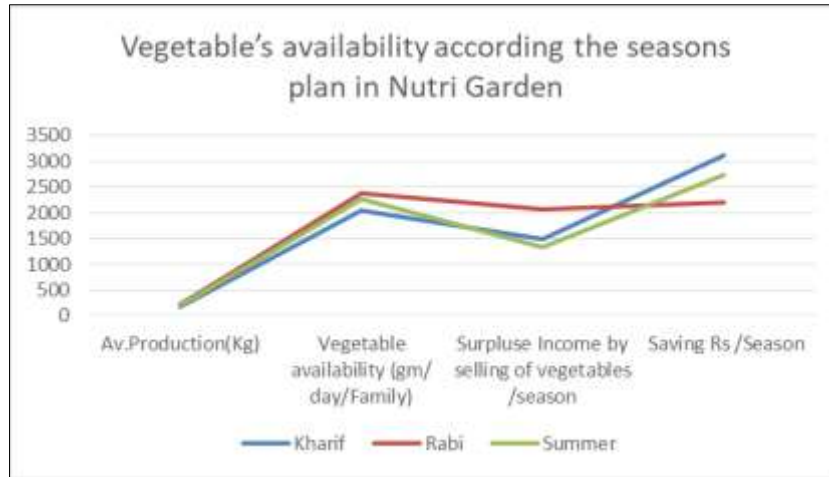


Fig 1: Availability of Nutrients in Kharif Season

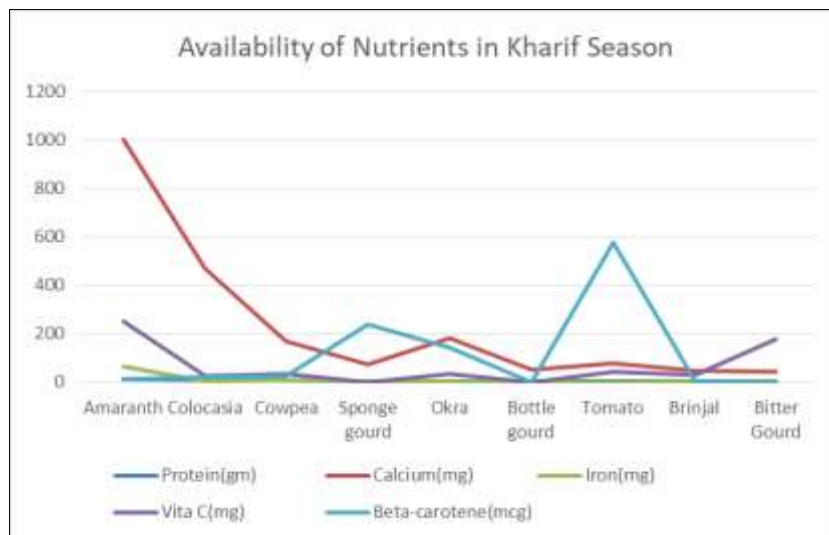


Fig 2: Availability of Nutrients in Rabi Season

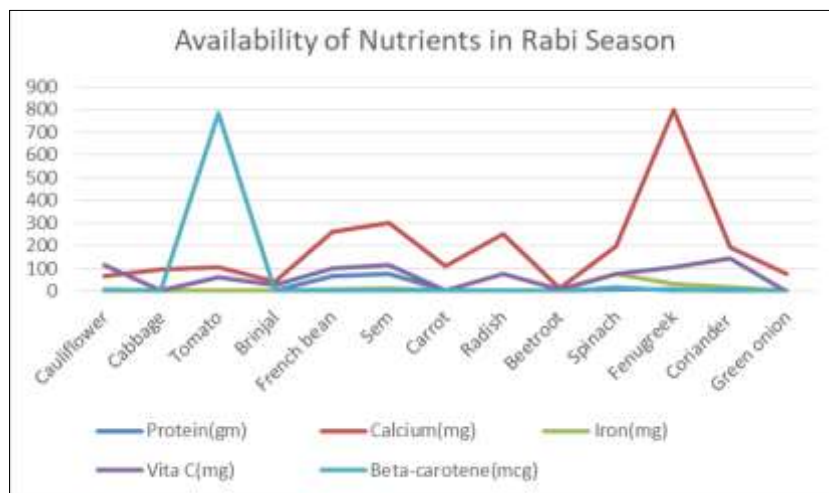


Fig 3: Availability of Nutrients in Kharif Season

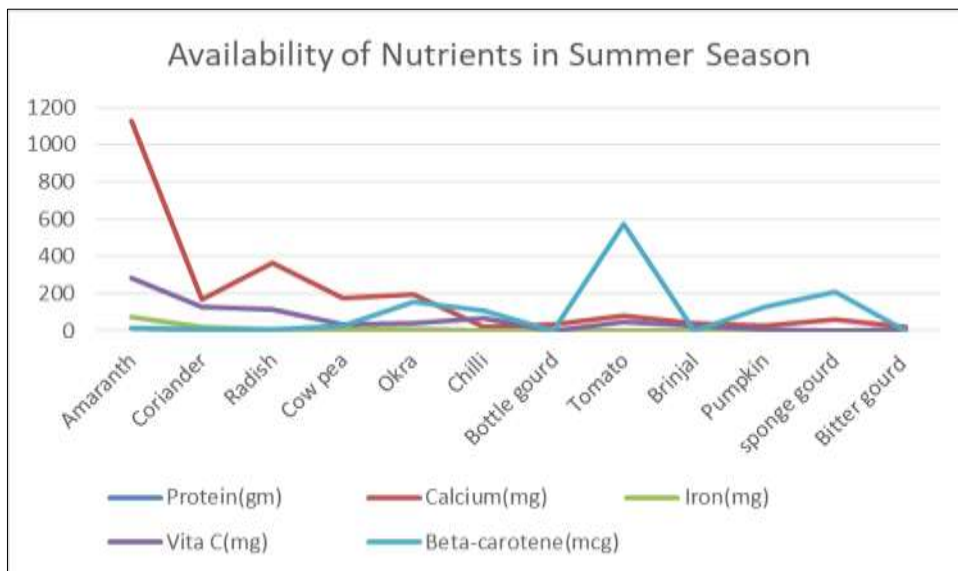


Fig 4: Availability of Nutrients in Summer Season

Results and Discussion

General profile of the respondents a total of 294 rural women were participated in 14 training programme on Establishment of Nutri-garden. They were of 21 to 57 years of age group. The mean age was 37.33±12.09 years. Most of the females were educated up to primary level (49.8%) and among them 18.4% were found illiterate. Majority of participants (54.6%) belonged to other backward class followed by schedule tribe (9.2%), general category (12.8%) and schedule caste (23.1%) Their per capita average surplus income 1632 Rs. per month and average saving 2691Rs per month in family budget.

Training

An interview schedule was used to assess the pre and post training knowledge of participants regarding various aspects of Nutri- garden. Training helps in better performance of the individual to carry out work more efficiently and effectively through improved knowledge and skill and brings changes in the attitude of the people. Nutrition education through intervention programmes were given to women, programmes consisted of regular contacts with the beneficiaries, lectures,

group discussions, demonstrations etc., to encourage categories. The availability of vegetables and fruits in a kitchen garden would increase consumption and hence mitigate malnutrition. Training enhanced knowledge and skill improve the ability of the individual to perform work more efficiently and effectively, which results in a change in attitude. A nutrition education intervention program was provided to women through regular contact, lectures, group discussions, demonstrations, etc., in order to encourage them to become more aware of nutrition. Vegetables and fruits available in a kitchen garden can help mitigate malnutrition by increasing consumption. The availability of the food would spur consumption as observed by a study of urban community gardeners in accordance, USA (Alaimo, 2008) [6]. The training program successfully addressed this knowledge gap, leading to significant improvements in understanding across all aspects of vegetable production through kitchen gardening. By the end, 94.4% of women understood the importance of kitchen gardening, while 98.2% had grasped post-harvest management and value addition techniques.

Table 2: Availability of Vegetables in Nutri Garden according to average production year of 2016-17 to 2021-22

Season	Vegetable availability(gm/day/family)	Protein	Calcium	Iron	Vita C	Beta-carotene(mcg)
Kharif	2044.40	44.65	2106.53	89.33	595.68	1017.38
Rabi	2377.31	178.97	2515.61	164.30	827.48	823.34
Summer	2270.53	43.69	2310.28	107.17	738.98	1232.37

Table 3: Av. Production (Kg), surplus Income and saving of Vegetables in Nutri Garden according to seasons of the year of 2016-17 to 2021-22

Season	Av. Production(kg)	Vegetable Availability(gm/ day/Family)	Surplus Income by selling of vegetables /season	Saving Rs /Season
Kharif	184.00	2044.41	1500	3125
Rabi	213.97	2377.37	2060	2200
Summer	204.35	2270.5	1337	2750

Frontline demonstration: Average per unit production and average availability of vegetables in Kharif 2044.40 gm/day/family, in rabi season was 2377.31 gm/day/family and summer season was 2270.53 gm/day/family presented in Table 3 and Table 4. In Kharif season kitchen garden was laid at 84 locations covering 2.1 ha area during the year 2016-17 to 2021-22. Average yield in farmers practice was only 87.72 kg where as in recommended practice of Nutri- garden, farm women harvested around 184.00 kg vegetables per unit in

kharif season, 213.97 kg harvested in rabi season and In summer season harvested in 204.35 kg /unit area. Vegetable availability of 2230.76 (gm/ day/Family) in around the year. Fig 1, 2, 3 showing availability of vegetables in terms of nutrient establishment of Nutri-garden in both kharif, rabi and summer season is presented nutrients (such as protein, iron, calcium, vit. C, beta-carotene) in leafy, cucurbits, beans, tuber and other vegetable.

Conclusion

It can be concluded from the findings of the above study that the availability of the nutrients especially the micronutrients can be increased in the daily diets of every individual by providing them adequate amount of vegetable through nutrition kitchen garden. Variety of vegetables should be grown in the kitchen garden order to address the problem of malnutrition. Nutrition gardening is not just about cultivating vegetables; it's about nourishing communities, empowering individuals, and building a more sustainable future. By embracing this simple yet powerful practice, we can ensure everyone has access to fresh, nutritious food, strengthen social bonds, and preserve cultural heritage.

References

1. Mamgai P, Nautiyal P, Jethi R. Nutri - gardens: A rich source of nutrition for farm women. LEISA INDIA; c2021. Available from: <https://leisaindia.org>
2. Jana H. Kitchen gardening for nutritional security. *Rashtriya Krishi*. 2015;10(2):13-16.
3. Landauer K, Brazil M. Tropical home gardens. Selected papers from an international workshop at the Institute of Ecology, Padjadjaran University, Indonesia, December 1985. United Nations University Press, Japan; c1985.
4. Singh A, Sharma A, Vishwakarma N, Baghel MS. Role of kitchen gardening to combat nutritional insecurity. *J Agri. Search*. 2021;8(3):290-294.
5. Kumari S. Vegetable-based nutri-garden for household food and nutrition security. *Indian Horticulture, Technical Report*; c2020 Oct. p. 35-36.
6. Alaimo KP. Food and vegetable intake among urban community gardeners. *J Nutr. Edu. Beh*. 2008;40:94-101.