

Role of Kitchen Gardening to Combat Nutritional Insecurity

ALKA SINGH^{1*}, ALPANA SHARMA², NEELU VISHWAKARMA³ AND M S BAGHEL¹

ABSTRACT

Malnutrition is rapidly growing problem across the country. Malnutrition not only slows down child growth and development but also increases the risk and duration of getting sick and also hindered social and mental development. The main cause of malnutrition is lack of nutrients in the diet. Mostly people depend on grains for food, less consumption of vegetables, green vegetables, fruits and milk are the reasons of malnutrition. Diet diversification is the best strategy to improve health and nutrition especially for poor. Fruits and vegetables are the best way to make health better, overcoming hunger and malnutrition. A study was conducted to address the malnutrition. For combating malnutrition, nutritional kitchen gardens were developed at farmers' field. After introduction of kitchen garden, there was a significant increase in nutrient content. As compare to their traditional practice of gardening they found 240 kg more vegetable through planned kitchen garden in a year and earned ₹3400/-. The availability of vegetables increased by 186 at house hold level. % change in Consumption gm/day was 41.6. With the availability of vegetable in the diet, farm families can reduce problem of malnutrition. Cultivation of vegetables at homestead level in systematic manner contributes to household food security as well as income also.

KEYWORDS

Malnutrition, Nutritional security, Kitchen garden, Dietary intake

ARTICLE INFO

Received on	:	21/05/2021
Accepted on	:	18/08/2021
Published online	:	05/09/2021



INTRODUCTION

Socio-economic and nutritional security has been challenging task for the farm women. A technological module has been developed by Singh *et al* (2012) to overcome the problems of farm women. Every farm women has the responsibility to ensure the health of her family. Malnutrition and poor health condition is most common problem in rural areas of India. It inhibits growth, enhances the risk and duration of diseases, decreases work output and slows social and mental development. Lack of availability of various food items to the needy is one of the major causes of malnutrition, other factors are low purchasing power, ignorance, large family size, lack of sanitation, hygiene and inability to absorb the available nutrients from food by the body. Consumption of protective foods like pulses, vegetables, milk and fruits is very low leading to many nutritional disorders. According to HUNGaMA (2011) Hunger and Malnutrition Report- malnutrition in Indian children continues to be of higher level with 42.3% being under weight, 58.8% stunted and 11% wasted (Indumathi *et al*, 2012). It is widely recognized that interventions on food security must also take into account the underlying nutritional security concern to ensure food and nutritional security for millions of people in Asia where the traditional food basket is grain staple (Dasgupta, 1934). For poor families, fruits and vegetables are the only source of micronutrients in their diet. Kitchen garden-

ing is one of the world's oldest food production practices and is practiced around the world. The kitchen/home gardens have been found to play an important role in improving food security for the resource poor rural households in developing country like Bangladesh (Asaduzzaman, 2011) and can do the same in India. Homestead production of fruits and vegetables provides the households with direct access to important nutrients that may not be readily available or within their economic reach. Vegetables play a crucial role in human's diet and rural generation should get the awareness about the importance of vegetable (Simple, 2017). The homestead garden can help in bridging the productivity gap between technical capability and the actual production level of food crops, due to low use of sub-optimal inputs and low adoption of most productive technologies (Tittonell and Giller, 2013). A kitchen garden/ homestead garden includes those people who are the greatest resource for development with a view to improving their livelihood and empowerment as envisaged in the concept of rural university. (Matthai, 1985). The kitchen gardens can be an example of how to attain food security not only to Sidhi district of Madhya Pradesh, but to the entire country when the knowledge and skills are transferred to other areas. About a third of the world's population suffers from one or more micronutrient deficiencies (Thompson and Amoroso, 2012). The kitchen garden comes under bio-intensive and participatory innovation that can provide availability, access and consumption in sufficient quantities

¹ Krishi Vigyan Kendra, Sidhi, Madhya Pradesh, India

² Krishi Vigyan Kendra, Shahdol, Madhya Pradesh, India

³ Krishi Vigyan Kendra, Jabalpur, Madhya Pradesh, India

*Corresponding author email: alkasingh80@gmail.com

and varieties that supply micronutrients by not only demanding calories but also resource poor. Iron deficiency affects about two-thirds of the world's population and consequently reduces the working capacity of the entire population (Wanjek, 2005). This serious obstacle to growth can be overcome only by the diversity inherent in the kitchen garden.

Importance of nutrition garden

Promoting local plants is a suitable strategy to increase vegetable consumption in a particular area. Many local plants have antioxidative compounds, anti-mutagenicity and anti-inflammatory properties (Chavasith, 1933). Nutrition awareness programs emphasize the need to include locally available fruits and vegetables like papaya, mango, guava and leafy vegetables in their daily diet. Hence every family or every citizen has a vital role in converting his surrounding vacant land into alive kitchen garden, where location specific seasonal vegetables and fruits are grown. The main purpose of a nutrition garden is to provide the family daily with fresh vegetables rich in nutrients and energy. A scientifically designed nutritional garden helps to meet the complete requirements of fruits and vegetables for a family throughout the year (Sheela *et al*, 1998). The fruits and vegetables are consumed by purchasing them from the market but for each small and marginal family it is not possible to include them in daily life. According to Prathiba and Rani (2012), A healthy vegetarian person should consume at least 125 grams of leafy vegetables, 100 grams of root vegetables, 75 grams of other vegetables and 85 grams of fruits, besides 475 grams of grains and 85 grams of pulses in their daily diet.

In order to ensure a healthy diet, fruits and vegetables are to be grown systematically in a small piece of land available in a home which is known as nutrition garden. This is important in rural areas where people have limited income and poor access to markets. Location specific programs like promotion of nutrition garden will play a major role in solving the problem of malnutrition. The concept of the nutritional garden aims at a continuous supply of vegetables to meet the daily needs of the family from the available area utilizing household wastes using organic matter including water (Indumathi *et al*, 2012). According to Shukla *et al* (2012) the development and maintenance of nutrition garden is a collective effort of family members led by a woman or housewife.

MATERIALS AND METHODS

The study was conducted in Upani village of Sidhi district to assess the impact of nutrition garden on the nutrient intake of families and economic status. Pre-survey was conducted to obtain basic information of families, malnutrition status and respondent's dietary food habits. Eight training programs were conducted in the village with total female participants of 150. Thirty families were selected through purposive sampling technique by screening households based on their willingness and interest to establish kitchen garden

in their farm or in their backyard to ensure nutrition security. It has also been ensured that the family should be of 4-6 members. For individual household, an area of 250m² was taken for the establishment of nutrition kitchen garden. The study was conducted in both kharif and rabi seasons. Krishi Vigyan Kendra, Sidhi has provided seed and planting material of improved varieties to the selected households. Different capacity building activities including input distribution, training and farmer's scientist interaction on various aspects including vegetable grown in homestead, homestead vegetable utilization, average vegetable consumption, nutrient contribution from homestead vegetable gardening were planned and undertaken. After one year of establishment of nutritional garden, data was collected and analyzed. Survey was conducted to collect baseline data of village population and nutritional status by means of a questionnaire. Nutrient availability, requirement and surplus/ deficit was computed by using following formula-

Availability= Production x nutrient requirement

Requirement= Population x per capita requirement

Surplus/ Deficit = Availability- Requirement

RESULTS AND DISCUSSION

Nutritional Status of Village

The data of the village population is presented in Table 1. The table indicates total village population is 4977. The number of children up to one year was 67 and upto 10 year was 517.

From the age of 10 years, there are 2146 male and 2246 female from total population. Data obtained is presented in Table 2 showed that total 136 out of 4977 were found malnourished. Of the malnourished children under the age of five, 15 were found wasted and 53 underweight. Among children aged 5 to 18 year, 23 boys and 28 girls were found to be malnourished and 2 adult male and 15 female were also found malnourished. Most of the girls and women were found to be anaemic.

Training knowledge regarding establishment of kitchen garden

A total of 150 rural women were participated in the training program. Trainings were imparted for up gradation of knowledge, improvement of the skills and change in attitude from traditional farming to scientific farming so as to enhance the production and productivity and empower the farm women. The knowledge of the participating women was assessed through the collection of data through an interview schedule before and after the training programmes. Data obtained is presented in Table 3 showed an increase in the knowledge of the participants after attending the training on various aspects of kitchen gardening. The least (08%) rural women had knowledge of biofortified varieties while the highest knowledge was seen on the land preparation aspect (74.67%) before training.

Table 1: Population of village in years

Population of village (Year)															
0-5 month	6-11 month	1-3	4-6	7-9	10-12	13-15	16-17	18-29	30 to above	Total					
					M	F	M	F	M	F	M	F	M	F	
31	37	177	234	106	45	88	124	153	126	142	737	566	1114	1297	4977

Table 2: Malnutrition status of village

Village	Total Pop-ulation	No. of malnourished Children (below 5 year)			No. of malnourished school going children and Adolescents (5-18 year)		No. of malnourished Adults		Total
		Stunting	Wasting	Underweight	Boys	Girls	Male	Female	
Upani	4977	0	15	53	23	28	2	15	136

After training, their knowledge in all aspects of vegetable production has been enhanced through kitchen gardening. A total of 96.67% rural women showed highest knowledge on post-harvest and value addition followed by inter-cultural operations (96%). Findings of Sharma *et al* (2018), Sharma *et al* (2018) and Singh *et al* (2018) also supported the study.

Table 3: Pre and post training knowledge regarding the establishment of kitchen garden (N-150)

SN	Particulars	Knowledge of farm women			
		Before Training		After Training	
		N	%	N	%
1.	Land preparation & Layout	112	74.67	142	94.67
2.	Improved seed varieties	25	16.67	135	90
3.	Biofortified varieties	12	08	138	92
4.	Appropriate sowing time	62	41.33	140	93.33
5.	Intercultural operations	105	70	144	96
6.	Organic plant protection measures	32	21.33	142	94.67
7.	Harvesting and storing seeds	78	52	139	92.67
8.	Post-harvest management & Value addition	74	49.33	145	96.67

Intervention and evaluation of kitchen garden

Nutrient content status before and after establishment of kitchen garden is presented in Table 4. Table depicted that after introduction of kitchen garden, there was a significant

increase in nutrient content. Finding of Fiedler (2014) supported the study. Production in crop or enterprise associated with availability of any of the nutrients. It is obvious from table that production plays a big role in the surplus of any nutrients, as production increases, the availability of nutrients also increases. Before the intervention there were protein and energy deficit, but after intervention the availability of protein increased from 829.41q to 1170.73q and energy also increased from 40928.64 kcal to 50909.16 kcal, due to which protein deficiency increased from -260.55q to 80.77q and energy deficiency from -8664.66 kcal to 1315.86 Kcal. Chayal *et al* (2013) reported that intake of energy, protein and iron increased after intervention of kitchen gardening intervention. Similar results were also reported by Singh *et al* (2018).

It is obvious from Table 5 that demonstration of kitchen gardening resulted in an increase in homestead vegetable production. Before intervention, respondents were practicing traditional practices; they used to grow only two or three seasonal vegetables and to fulfill the requirement, they had to purchase vegetables from market for consumption. Also, the production of vegetables at beneficiaries increased 344.4 percent (Table 5) which resulted in increased profit (314.6%). Similar results were reported by Chayal *et al* (2013) & Arya *et al* (2018).

Impact of Kitchen Gardens on household Nutritional Status

Impact of kitchen gardens on household nutritional status was observed and the results obtained are shown in the Figure 1. It is evident from the table that nutritional kitchen gardens significantly reduce the malnutrition status of village.

Table 4: Nutrient content status

Nutrient Content	Availability	Requirement	Surplus/Deficit
Before intervention			
Protein(q)	829.41	1089.96	-260.55
Fat(q)	559.33	544.98	14.35
Energy (Kcal)	40928.64	49593.30	-8664.66
Vitamin A (q)	0.4540	0.0872	0.37
Vitamin C (q)	40.531	0.727	39.80
Ca (q)	328.02	10.899	317.12
Iron (q)	12.01	0.309	11.70
After intervention			
Protein(q)	1170.73	1089.96	80.77
Fat(q)	793.83	544.98	248.85
Energy (Kcal)	50909.16	49593.30	1315.86
Vitamin A (q)	0.57	0.0872	0.48
Vitamin C (q)	56.17	0.727	55.44
Ca (q)	462.60	10.899	451.70
Iron (q)	16.90	0.309	16.59

The prevalence of illnesses decreased by more than 50%. Figure showed that number of wasting children decreased from 15 to 02 and wasted children from 53 to 12. In the survey, 51 children both boys and girls of age group of 5-18 were malnourished before joining nutrition gardens and after joining the kitchen garden the number decreased to 18 by the time the survey was carried out. Similarly, after the intervention, only 04 women were remained anaemic. This study has evidence to prove the positive influences of kitchen gardens on household nutrition.

Table 5: Production and income of families from kitchen garden

Particulars	Production (kg)	Net profit (₹)
Before	54	820
After	240	3400
Change	186	2580
Percent change	344.4	314.6

REFERENCES

Arya S, Prakash S, Joshi S, Tripathi K and Singh V. 2018. Household Food Security through Kitchen Gardening in Rural Areas of Western Uttar Pradesh, India. . *Int. J. Curr. Microbiol. App. Sci.* 7(2):468-474.

Asaduzzaman NS 2011. Benefit-Cost Assessment of Different Vegetable Gardening on improving Household Food and Nutritional Security in Rural Bangladesh. In *Agricultural & Applied Economics Association's 2011 AAEA & NAREA Joint Annual Meeting.*

This is in line with theory where gardening is believed to improve intake of health food, promote physical and mental health through relaxation and satisfaction as well as building communities (Wakefield, 2007).

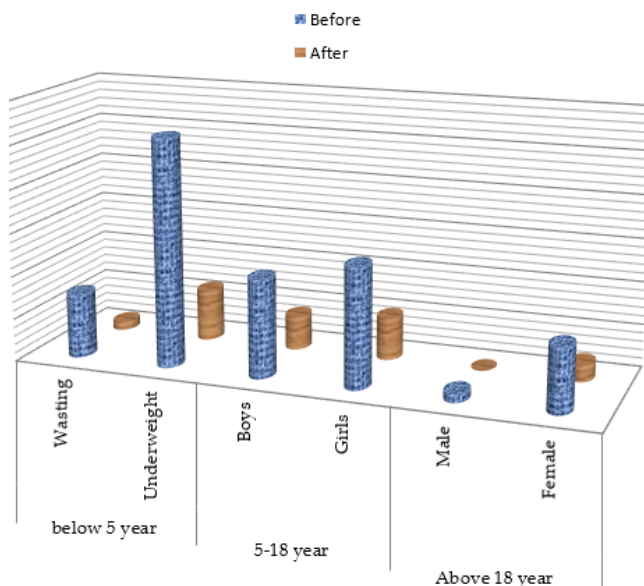


Fig. 1: Changes in nutritional status of village

CONCLUSION

It may be concluded that 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. Even very poor, or landless people can also do gardening in small pieces of land, empty plots or in containers. Therefore, Kitchen gardening is a good means to improve household food security, it should be encouraged and adopted in the entire country. Kitchen garden provides an opportunity to farm women to earn money and engage themselves in work along with proper utilization of place and water.

Chavasith V 1933. Importance of vegetables to achieve food and nutrition security in South-east Asia. In Mai C, Proc. Regional Symposium on high value vegetables in South-east Asia: Production, Supply and Demand, 24-26.

Chayal K, Dhaka BL, Poonia MK and Bairwa RK. 2013. Improving nutritional security through kitchen gardening in rural areas. *Asian Journal of Home Science* 8(2):607-609.

Dasgupta S 1934. Vegetable production and productivity gains are key to increasing food and nutrition security in Asia. In Mai C, Proc. Regional Symposium on high value vegetables in South-

- east Asia Production, Supply and Demand, 24-26.
- Fiedler JL. 2014. Food crop production, nutrient availability, and nutrient intakes in Bangladesh: Exploring the agriculture-nutrition nexus with the 2010 Household Income and Expenditure Survey. *Food and Nutrition Bulletin* 35(4):487-508.
- HUNGaMA 2011. The HUNGaMA (Hunger and Malnutrition) Survey Report 2011. url: <http://motherchildnutrition.org/resources/pdf/HungamaBKDec11LR.pdf>.
- Indumathi K, Shanmugam P and Tamilselvan N 2012. Nutrition garden as a valuable intervention to fight malnutrition in rural India. . In Global Conference on Horticulture for food, nutrition and livelihood options., Bhubaneswar, Odisha, India, 28-31.
- Matthai RJ 1985. The Rural University: The Jawaja Experiment in Educational Innovation. Popular Prakashan, Mumbai, India.
- Prathiba and Rani S 2012. Nutrition gardening – A venture to mitigate malnutrition. In Global Conference on Horticulture for food, nutrition and livelihood options, Bhubaneswar, Odisha, India.
- Sharma A, Vishwakarma N, Kumar A, Singh M and Tripathi PN. 2018. Impact of nutritional kitchen garden trainings imparted by Krishi Vigyan Kendra. *International Journal of Farm Sciences* 8(1):13-16.
- Sheela KB, Peter K and Krishnakumari K 1998. Nutrition garden, Directorate of Extension, Kerala Agricultural University, pp 86 . In Nutrition garden, Directorate of Extension, Vellanikkara, Thrissur.
- Shukla P, Rajkumari and Limbu R 2012. Nutrition garden as a tool towards combating nutrient deficiencies. In Global Conference on Horticulture for food, nutrition and livelihood options, Bhubaneswar, Odisha, India, 28-31.
- Simple J. 2017. Development and Field-Testing of A Flipbook on 'Vegetables in diet' for rural women. *Journal of Community Mobilization and Sustainable Development* 12(1):136-140.
- Singh A, Gautam U and Singh SRK. 2012. Socio-economic empowerment of farmwomen in Madhya Pradesh through suitable technological interventions: A Krishi Vigyan Kendra (KVK) Approach. *Indian Journal of Extension Education* 48(1&2):74-77.
- Singh V, Yadav K and Tripathi AK. 2018. Kitchen gardening: a promising approach towards improving nutritional security in rural households. *International Journal of Microbiology Research* 10(5):1216-1219.
- Thompson B and Amoroso L 2012. Combating Micronutrient Deficiencies: Food-based Approaches. url: <http://www.fao.org/3/am027e/am027e00.pdf>.
- Tittonell P and Giller KE. 2013. When yield Gaps are Poverty traps; The Paradigm of Ecological Intensification In Africa Smallholder Agriculture. *Field Crops Research* 143:76-90. doi: <https://doi.org/10.1016/j.fcr.2012.10.007>
- Wakefield S. 2007. Growing urban health: community gardening in South-East Toronto. *Health Promote Int.* 22(2):92-101.
- Wanjek C 2005. Food at Work; Workplace solutions for malnutrition, obesity and chronic diseases, pp 448. Geneva: ILO. In Food at Work; Workplace solutions for malnutrition, obesity and chronic diseases.

Citation:

Singh A, Sharma A, Vishwakarma N and Baghel MS. 2021. Role of Kitchen Gardening to Combat Nutritional Insecurity. *Journal of AgriSearch* 8(3): 290-294