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Phool Kumari
Krishi Vigyan Kendra,
Hamirpur, Uttar Pradesh, India

Mustafa
Krishi Vigyan Kendra,
Hamirpur, Uttar Pradesh, India

Anant Kumar
Krishi Vigyan Kendra, Auraiya,
Uttar Pradesh, India

SPS Somvanshi
Krishi Vigyan Kendra,
Hamirpur, Uttar Pradesh, India

Ashok Kumar Kushwaha
Krishi Vigyan Kendra,
Hamirpur, Uttar Pradesh, India

Corresponding Author
Phool Kumari
Krishi Vigyan Kendra,
Hamirpur, Uttar Pradesh, India

Ensuring household nutritional security and diversity through nutri-garden in Hamirpur district of Bundelkhand region (U.P.)

Phool Kumari, Mustafa, Anant Kumar, SPS Somvanshi and Ashok Kumar Kushwaha

Abstract

The vast majority of hungry and malnourished people live in our countries under sub-standard living conditions. Kitchen garden is a realistic solution as in rural area to solve the nutritional insecurity. Thus the study were planned keeping in view to Improved food security, Increased availability of food and better nutrition through food diversity and enhanced rural employment through additional or off-season production in rural areas of Hamirpur district. To fulfil the objectives of the present study the purposive experimental study was planned. The study was conducted under Natural Resource Management Interventions (NICRA) Project in 02 villages Manki Khurd and Pachkhura Khurd of Hamirpur District. Twenty Five farm families were selected from each village. Thus 120 farm families were selected for the study having area near the house of 150 m². It was found that Unused land near the house (37.50%) followed by in cultivated area near the house (30.00%), only 13.33 percent Farm family's available court yard for Nutri-garden in Hamirpur district. It was Found that cent percent farm women has no knowledge about seed rate and seed treatment, majority of the respondents were having no knowledge about variety of seeds and manure and fertilizer (96.67) followed by IPM (94.17). Sixty five per cent farm women have no knowledge about daily requirement of vegetables in daily routine diet. It was also found that from 150 m² area of kitchen garden fulfilled more than requirement of vegetable in daily routine diet for Family (Up to 6 Members) in Rabi season (82.71%) followed by 82.71per cent in Kharif season and 66.08 per cent in Zaid season. The availability of green leafy vegetables was found more i.e (59.36 gm. /person/ day) and others vegetables was found less (154.68 gm./person/ day) as compare to recommended by ICMR 2012. The average net income saved by the farmer is Rs. 6037.98 in a year through the kitchen garden.

Keywords: Food security, nutritional diversity, kitchen garden and malnutrition

Introduction

Food security and nutritional diversity is a key area that a developing country should address. The vast majority of hungry and malnourished people live in our countries under sub-standard living conditions. Food and Agriculture Organization (2014) [5] projected that global food production will need to increase by 70% in order to meet the average daily caloric requirement of the world's population in 2050. Vegetables occupy an important place in our daily life especially for vegetarians. Vegetables are the only source to increase not only the nutritive values of foods but also their palatability. For a balanced diet, an adult should have an intake of 85gm of fruits and 300 gm of vegetables per day according to the dietary recommendation of nutrition specialists by ICMR (2012) [1]. But the present level of production of vegetables in our country can permit a per capita consumption of only 120 gm of vegetables per day.

The quantity of vegetables produced per capita in India is much lower than what is recommended by the dieticians. In India per capita availability is around 135 gm against the minimum requirement of about 300gm for a balanced diet. Even this low level of average supply does not fully reflect the consumption pattern of the rural household and those below the poverty line where per capita, vegetable consumption is very low, even lower than 40gm per day. It is now well-conceived that by simply adding greens and other vegetables to the available food grains the diet of the average Indians can substantially be upgraded. To make this recommendation realistic promotion of Nutri-garden is the best option that can supply required vegetables in daily routine diet to the rural families.

In Bundelkhand region many semi-arid and arid areas particularly exposed to the impacts of climate change and are projected to suffer a decrease of water resources.

Very less farmers were growing vegetables in summer season. So that lots of population suffering from malnutrition problems. Hence, Kitchen garden is a realistic solution to solve the nutritional insecurity in this region. Thus the study were planned keeping in view to Improved food security, Increased availability of food and better nutrition through food diversity and enhanced rural employment through kitchen garden in rural areas of Hamirpur district in Bundelkhand Region.

Materials and Methods

The study was conducted by Krishi Vigyan Kendra, Hamirpur under NICRA Project. To fulfil the objectives of the present study the purposive experimental study was planned. The study was conducted in two villages: Manki Khurd of Kurara Block and Pachkhura Khurd of Sumerpur Block of Hamirpur District, which is adopted under NICRA Project. Sixty farm families were selected from each village. Thus Total 120 Farm families were selected for the study having the area near the house, Courtyard etc. of 150 m². The Vegetables seeds and seed lings were provided in Kharif, Rabi and Zaid

seasons. Data was collected through a well developed interview schedule to elicit information from the kitchen gardening trainees. Simple descriptive statistics was employed in order to have a summary description of the data collected. This involved the use of percentages, means and frequency distributions to describe parameters as socioeconomic characteristics.

Results and Discussion

Kitchen gardens are indigenous livelihood practices, especially among women; a scientific approach in the provision and promotion of livelihoods through training sessions aims to make these livelihoods sustainable. Most of the beneficiaries valued livelihood assistance. The results were especially visible in poor households. Kitchen gardening training has benefited the target community to practice alternative livelihoods. Still, a follow-up plan is needed to ensure that such techniques are practiced on a large scale with market links to assist ecological and economical development in the project area.

Table1: Distribution of respondents on the basis of availability of area and vegetables grown before intervention N= 120

Area Available	No. of respondents / %	Respondents grown before intervention		No. of respondents grown vegetables in different season before intervention								
		Yes	No	Kharif			Rabi			Zaid		
				GLVs	F/R	All	GLVs	F/R	All	GLVs	F/R	All
Backyard/ Court yard of house	16 (13.33)	12	04	-	12	-	03	09	00	01	00	-
Unused land near the house	45 (37.50)	16	29	01	14	01	04	11	01	03	02	-
Cultivated areas near the house	36(30.00)	15	21	01	12	02	03	10	02	06	09	-
Cultivated area near the tube well	23(19.17)	07	16	02	04	01	01	01	05	01	03	03
Total	120(100)	50	70	4	42	4	11	31	8	11	14	03

GLVS- Green Leafy Vegetables, F/R- fruits and Roots Vegetables

Table-1. reveals that area available for kitchen garden in most of the farm families were Unused land near the house (37.50%) followed by in cultivated area near the house (30%) and Cultivated area near the tube well (19.17%) only 13.33 percent Farm family's available courtyard for Nutri-garden in Hamirpur district. It was also found that only Fifty Farmers were grown vegetables, out of which only three farmers were grown all types of vegetables throughout the year before the

intervention of this programme due to lack of awareness, laziness and lack of seed. Tabinda Qaiser *et al.* (2013) ^[4] also reported that the potential land availability of kitchen gardening in courtyards were 55% while cultivated area around the house and fields was 23% similarly existing area under fruits and vegetables was 42.86% in the field followed by 38.10% was around house. A similar study also found by Rupinder *et al.* (2017) ^[6].

Table 2: Distribution of respondents on the basis of awareness regarding selected scientific technology before introducing Kitchen gardening

n =120

S. No.	Selected scientific technology	Awareness level		
		No knowledge	Low	Medium
1.	Sowing time	68(56.67)	42(35.00)	10(8.33)
2.	Improved varieties	116(96.67)	04(3.33)	00
3.	Seed rate	120(100.00)	00	00
4.	Transplanting distance	76(63.33)	29(24.17)	15(12.50)
5.	IPM	113(94.17)	07(5.83)	00
6.	Stages of irrigation	116(96.67)	04(3.33)	00
7.	Seed Treatment	120(100.00)	00	00
8.	Manure and fertilizer	116(96.67)	04(3.33)	00
9.	Nutritious food and vegetables	51(42.50)	42(35.00)	27(22.50)
10.	Requirements of vegetables in daily diet	78(65.00)	27(22.50)	15(12.50)

It is evident from the Table 2 that respondents were ranked into no knowledge, low and medium level of their awareness regarding selected scientific technology for kitchen gardening. It was observed that cent percent farm women has no knowledge about seed rate and seed treatment, majority of the respondents were having no knowledge about variety of

seeds and manure and fertilizer (96.67) followed by IPM (94.17), Transplanting distance (63.33) and Sowing time of vegetables seed 68 (56.67).Sixty five per cent farm women have no knowledge about daily requirement of vegetables in daily routine diet.

Table 3: Round Year Production and Availability of vegetables through kitchen garden

Season	Average no of Family member	Reqd. of Vegetables Throughout the year (Kg.)	Availability of vegetable(Kg.)	Gap/ Difference (Kg)	Reqd. Fulfilled (%)	Cost of cultivation (Rs.)	Gross Income (Rs.)	Net Income (Rs.)	B:C Ratio
Kharif (122 Days)	06	219.60	181.65	-37.95	82.71	680.0	2901.8	2221.8	1:4.26
Rabi (123 Days)		221.40	246.83	25.43	111.48	880.00	2557.68	1677.68	1:2.90
Zaid (120 Days)		216.00	142.75	-73.25	66.08	980.00	3118.50	2138.5	1:3.18
Throughout the year		657.00	571.23	85.75	86.94	2540.00	8577.98	6037.98	1:3.37

Source: ICMR 2012-Guidelines for Indian, Requirement of Vegetables/ day/ person 300gm

The results depict that according to season, the quantity of vegetables produced per household was maximum in Rabi season whereas lowest in Zaid season due to scarcity of water during summer in Bundelkhand region. Study also supported by Aliza *et al.* (2018). It was also found that from 150m² area of kitchen garden fulfilled more than requirement of vegetable in daily routine diet for Family (Up to 6 Members) in Rabi season (82.71%) followed by 82.71per cent in Kharif season

and 66.08 per cent in Zaid season. The average net income saved by the farmer is Rs. 6037.98 in a year through the kitchen garden. Cost of cultivation included but cost of labour no matter which was done by family members. Phool *et al* (2018) [7] also reported that from 150m² (for Small Family) of kitchen garden 100% fulfilled the requirement of vegetable in daily routine diet and save money in buying vegetables.

Table 4: Impact on Nutritional Requirement fulfilled of vegetable through kitchen garden

Model of Kitchen Garden	No. of Family member	Requirement /Availability of types of Vegetables /day/ person (gm.)	Requirement / Availability of types of Veg. throughout the year (Kg.)	Nutritional Requirement fulfilled / Person/ day									
				Energy (Kcal)	Protein (gm)	Fat (gm)	CHO (gm)	Fiber (gm)	Vit. A (µg)	Vit C (mg)	Thimin (mg)	Raiboflavin (mg)	Iron (mg)
(150 m ²)	06	Green leafy Veg. 50 gm / 59.36 gm	109.50/130.30	38	2.0	0.2	2.0	0.7	770	6.6	0.01	0.09	1.95
		Root and Tuber 50gm / 46.65 gm	109.50/102.18	34	0.5	0.1	3.2	0.5	348	5.0	0.02	0.01	0.51
		Fruits and Beans 200gm / 154.68 gm	438.00/338.75	69	1.8	0.4	9.7	2.5	118	13.3	0.08	0.08	1.10
Round the year		300gm./ 260.69 gm	657.00/571.23	141	4.3	0.7	14.9	3.7	1236	24.9	0.11	0.18	3.56

Source: C. Gopalan *et al.* ICMR 2012- Nutritive value of Indian Foods



Fig 1: Distribution of Vegetables Seeds



Fig 2: Kitchen Garden at Farmers Fields

Table-4. depicts that the availability of green leafy vegetables were found quite more i.e. (59.36 gm./person/ day), root and tubers and others vegetables were found quite less 46.65gm and 154.68 gm. /person/ day) as compare to recommended by ICMR 2012 that every individual should consume at least 300 g vegetables and 100 g fresh fruits /day (green leafy vegetables – 50 g, other vegetables 200 g, roots and tubers -50 g) and pregnant women should consume 100 g

leaf vegetables/day. The availability of macro and micro nutrients such as Protein 4.3 gm, Fat 0.7 gm, CHO 14.9 gm were also found sufficient in diet from vegetables, as per National Institute of Nutrition, Indian Council of Medical Research (ICMR 2018) [8] recommended minimum requirements of Protein-20.0 gm from cereals, 21.0 gm from pulses, 10 gm from milk, 4.0 gm from vegetables, 1.0 gm fruits and 4.0 gm from Nuts & seeds for per person /day for

healthy life. In this content table depicts that Shikha Bathla *et al.* (2018) [9] reveals that there was quite lower intake of green leafy vegetables (3.9%), fruits (14.8%), roots, tubers and

other vegetables (31.9%), pulses (62.5%), cereals (71.9%) and milk products (72.3%) as compared to Suggested Dietary Guidelines (SDI) by the Indian Council of Medical Research.

Table 5: Impact of kitchen gardening on rural areas

Impact	Before Programme	After Programme
Practice of Kitchen Gardening throughout the year	Only 03 farm Family	All selected farm families
Type of vegetable grow	Only Bottle guard and sponge guard and few green leafy	All types of vegetables
Grow vegetables in all season	Some people only Kharif and Rabi season	All families growing throughout year
Impact on livelihood	Buy costly vegetables and poor health	Saving money, improvement in physical health (fitness)
Knowledge about daily intake vegetables in diet	Not aware	Have award and used 224-300 gm / person /Day
Selling of surplus Vegetables	Only 01 Participant	More than 22 Participants

Table 5 reveals the impact of kitchen gardening on rural communities. Economically, after starting Kitchen gardening improved the livelihood of local community in the targeted area. It was acknowledged that after FLD programme, all the participants were taking more interest. It was also found that after introducing kitchen garden people save money in buying vegetables, more than 22 farmers earn money by selling of surplus vegetables and use fresh and organic vegetables were used vegetables in daily routine diet. The practice of kitchen gardening is increased, similarly the cultivated land were also increase after the kitchen gardening training (Dilrukshi Hashini 2013) [3].

Conclusion

Thus the Nutritional Kitchen Garden plays a crucial role for awareness regarding to take adequate vegetables in daily diet to solve the nutritional problems in rural areas. The result indicated that the before introduce of refined technology of nutritional kitchen garden the farmers/ farm women were not aware and also used inadequate amount of vegetables in daily diet whereas after introducing of refined technology the production of vegetables increased as well as consumption of vegetables in daily diet also. Initially, low level of consumption observed may due to lack of awareness regarding importance of green leafy vegetables in the diets.

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