

Original Research Article

**Improving Nutritional and Food Security through Kitchen Gardening in  
SawaiMadhopur District of Rajasthan**

Comment [Ma1]: The topic can be rephrased

**Abstract**

Nutritional deficiency like Anaemia, PEM a serious nutritional problem in rural and urban areas in women, pregnant women and adolescent girls; resulting in different types of diseases, negative effects on physical growth and retarding brain development. 77 percent of families in Indian households; vegetables and fruits are often the only source of micronutrients in their diet. Homestead production of fruits and vegetables provides the people the direct access to important nutrients that may not be readily available or within their economic reach. Hence, kitchen gardening is an important strategy to improve household nutritional and food security. Present study was conducted in Sawai Madhopur district of Rajasthan to quantify the impact of 120 kitchen gardens to improve nutritional security of households in rural areas. The results suggest that kitchen gardening has proved a Feasibility, Accessibility and Replicability to livelihood strategy for resource Farming Community in terms of nutrient as well as calorie intake and economic performances. In 2019-2020 around 100 Kitchen Garden kits have been distributed among women beneficiaries of Padli villages, in Sawai Madhopur block under NARI programme of KVK, Sawai Madhopur.

**Keywords:** Nutritional security, Kitchen gardening, Rural areas

**Introduction**

Protein Energy Malnutrition (PEM) is a deficiency disease caused in the infants due to 'Food Gap' between the intake and requirement. It affects children under 5 mostly belonging to the poor underprivileged communities. PEM is particularly serious during the post-weaning stage and is often associated with infection. Clinical signs and symptoms of protein-energy malnutrition (PEM) include Poor weight gain, Slowing of linear growth, Behavioural changes - Irritability, apathy, decreased social responsiveness, anxiety, and attention deficits. Protein-energy malnutrition (PEM), sometimes called protein-energy

undernutrition (PEU), is a form of malnutrition that is defined as a range of conditions arising from coincident lack of dietary protein and/or energy (calories) in varying proportions. The condition has mild, moderate, and severe degrees. EM is fairly common worldwide in both children and adults and accounts for about 250 000 deaths annually.<sup>[2]</sup> In the industrialized world, PEM is predominantly seen in hospitals, is associated with disease, or is often found in the elderly.<sup>[3]</sup> Note that PEM may be secondary to other conditions such as chronic renal disease<sup>[4]</sup> or cancer cachexia<sup>[5]</sup> in which protein energy wasting (PEW) may occur.

Protein–energy malnutrition affects children the most because they have less protein intake. The few rare cases found in the developed world are almost entirely found in small children as a result of fad diets, or ignorance of the nutritional needs of children, particularly in cases of milk allergy.<sup>[6]</sup> It retards growth, increases the risk and duration of illness, reduces work output and slows social and mental development. For poor households, vegetables and fruits are often the only sources of micronutrients in the family diet. Home gardening is one of the world's most ancient food production practices and is practiced throughout the world (Landauer and Brazil, 1985). 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. So, home gardening would be a good means to improve household food security (Talukder *et al.*, 2002). Therefore, present study was conducted to see the impact of kitchen gardening in improving the nutritional security of households in rural areas. The basic nutritional need of women age group between 18-40 years. In between this age group maximum women's grow-up, conceives child and do maximum house hold works. This table clearly shows daily nutritional requirement for women like Energy, protein, fat, iron, B carotene, Vitamin C in form of different cereals, pulses, green leafy vegetables, fruits.

## Research Methodology

The study was conducted in Sawai Madhopur district of Rajasthan. In Sawai Madhopur, there were total 5 blocks namely

Sawai Madhopur, Chouthka Barwara, Khandaar, Bonli, Malarna. For the study Sawai Madhopur block was selected as NARI programme Village “Padli”. There were all 100 nutritional garden seed kits were distributed to selected families Randomly. Different capacity building activities including training, exposure visit and farmer’s scientist’s interaction on various aspects including

Fig 1. Map showing study location



vegetable grown in homestead, homestead vegetable utilization, average vegetable consumption, nutrient contribution from homestead vegetable gardening were planned and undertaken. Pre-survey was conducted to obtain information regarding profile and respondent’s dietary food habits and nutritional deficiency diseases were also pre-surveyed. After one year of establishment of nutritional garden, a post-survey was done to analyse the impact of kitchen gardens on nutritional status of selected families. Data were collected by interview schedule. Map of Sawai Madhopur shows production and productivity of major recipes.

## Research Findings and Discussion

Socio-economic characteristics of respondents were analyzed and presented in Table 1. The table indicates that majority (75%) of respondents were belonged to joint family and followed by (25%) nuclear family. It was found that majority of the families (65%) were from medium sized families followed by small size (20%) and big size (15%). Results on family income showed that majority (76%) of respondents belonged to income group of more than Rs.

1.0lack.Whilelookingattheireducationalstatus,resultsrevealedthat70percentheadsof thefamilywereliterateto primary level educated. Results on land holding depicts thatmajority (60%) had medium scale land followed by small(30%)scalelandandonly(10%)hadlargescaleland.

**Table 1. Socio-Economic Status of Families N=100**

S.No	Variables	Category	Number	Percent
1	Type of Family	Joint Family	75	75
		Nuclear family	25	25
2	Size of Family	Small size(1-4)	20	20
		Medium size(5-7)	65	65
		Large size(more than 7)	15	15
3	Annual Income	< 50000	10	10
		50000-100000	14	14
		>100000	76	76
4	Education	Illiterate	70	70
		Literate	8	8
		Primary	9	9
		Middle	11	11
		Graduation	2	2
5	Land Holding	Small	30	30
		Medium	60	60
		Large	10	10

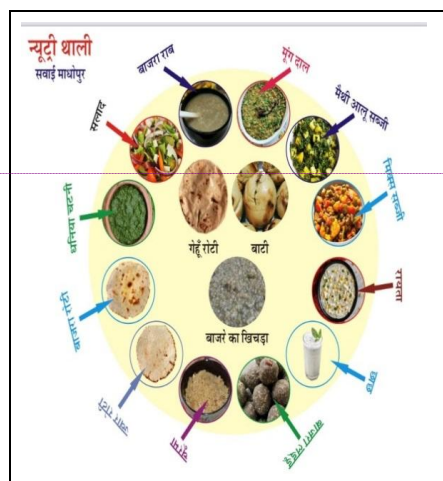
**Comment [Ma2]:** The currency mark. (Is it dollar or Pound)

**Comment [Ma3]:** Should be more specific. Illiterate (No school) and Litrate (Level of school)

**Comment [Ma4]:** Size of farm land in hectares.

**Fig 2. Nutritional food security**

Before demonstration respondents cultivated hardly grows 3 or 4 vegetables in their gardens such as green chilli, brinjal,dhaniya,Padiana,palak etc.Butafterintervention they had grown 21 items of vegetables like thatbottlegourd,bittergourd,greenchilli,brinjal,summersquash, tomato, cucumber, ridge gourd, okra, cluster bean,cow pea, spinach, coriander, cualiflower, onion, cabbage,carrot, pea,



**Comment [Ma5]:** English name for this plants

fenugreek, radish, papaya, guava, improved variety of millets of bazra and jowar in *Kharif*, *Jaya* and *Rabi* seasons. Women of Padli were efficiently doing kitchen gardening which contributes maximum nutritional meals in their daily Nutri -thali with fruits. Many Household women started nutria-garden and achieve nutritional food security.

It is evident from Table 2 that kitchen gardening demonstration resulted in increase in homestead vegetable production, consumption and distribution of excess vegetables to neighbors and relatives. Before intervention, respondents were practicing traditional practices; they used to grow only one or two seasonal vegetable. To fulfil the requirement, they had to purchase vegetables from market for consumption. It is obvious from Table 3 that production of vegetables at beneficiaries increased 193.27 percent which resulted in increased consumption (89.55%) and distribution (450 %) and money saving.

**Table 2: Vegetable Production and Utilization**

S. No.	Particular	Production (kg)	Purchase (kg)	Distribution (kg)	Consumption (kg)
1	Before Intervention	205	72	12	265
2	After Intervention	990	0	91	563
3	Change	785	-72	79	298
4	Per cent of Change	193.27	100	450	89.55

Different essential nutrients contribution from vegetables is presented in Table 3. Nutritional value of different vegetables was calculated according to ICMR guidelines. Table 3 indicates that there was a significant increase in consumption of all nutrients and food items were increased with quantity as well as quality. Table 3 clearly shows the difference between before and after intervention. Data in Table 3 reveals cereals increased by 223.12, pulses by 39.00, green leafy vegetables 50.00, root tubers by 72, fruits by 50.3. Table further depicts that after intervention farming families receive energy 1945, fat 21.00, calcium 382, Iron 16.00, B-carotene 3120, Vitamin C 35. This is highly close to ICMR recommendations. Although dietary need of body varied situation to situation but recommendations were followed the graph of normal and healthy dietetics values. It was also found that intake of energy, protein and iron increased after intervention of kitchen gardening intervention. The basic

nutritional need of women age group between 18-40 years. In between this age group maximum women's grow-up, conceives child and do maximum house hold works. This table clearly shows daily nutritional requirement for women likes Energy, protein, fat, iron, B carotene, Vitamin C in form of different cereals,pulses,green leafy vegetables, fruits.Kitchengardens predicts as best source of nutritional and Food security in contexts of Accessibility,Replicability and Utility.

Accessibility asKitchen gardens are helpful to provide nutritional & economically advantages. Nutritionally &economically beneficial for farm families & Urban Households. Replicability asKitchen gardening is only given at KVK campus.Utility asby growing kitchen gardens a family can save about 50 thousand rupees yearly.

**Table 3. Change in Nutritional Status through Homestead Vegetable Production**

S.No.	Essential Nutrients/Food Groups	Per Head Per Day Consumption through Vegetables/ Oils/ Fruits/Nutrients		
		Balanced Diet	Before Intervention	After Intervention
1.	Cereals(g/d)	270	201.01	223.12
2.	Pulses(g/d)	60	32.30	39.00
3.	Green leafy vegetable(g/d)	100	36.2	50.00
4.	Root-tubers(g/d)	200	55	72
5.	Other vegetables(g/d)	250	85.01	120
6.	Fruits	100	25.3	50.3
7.	Milk & milk products(g/d)	300	134	142
8.	Fat & oil(g/d)	20	30	26.8
9.	Sugar(g/d)	20	40	22
10.	Energy(Kcal)	2230	1512	1945
11.	Protein(g)	55	25.35	39.33
12.	Fat(g)	25	22.30	21.00
13.	Calcium(mg)	600	280	382
14.	Iron (mg)	21	10.53	16.00
15.	B Carotene (ug)	4800	1130	3120
16.	Vitamin C(mg)	40	24	35.2

#(ICMR,2017)\*\*Nutrition to Women Between 18-45 years of Age

**Comment [Ma6]:** More meaning for g/d (Gram per day), mg (milligram) etc.

**Conclusion:**

It may be concluded that establishment of kitchen gardens had immense role in tackling the problem of malnutrition and micronutrient deficiencies in rural areas. Farm families were highly satisfied by growing kitchen gardens which provide them daily best meal in their thali, nutrition, variety, economically well saving and easily available. After intervention they had grown 21 items of vegetables like that bottle gourd, bitter melon, green chilli, brinjal, summer squash, tomato, cucumber, ridge gourd, okra, cluster bean, cow pea, spinach, coriander, cauliflower, onion, cabbage, carrot, pea, fenugreek, radish, papaya, guava, improved variety of millets of bajara and jowar in *Kharif, Jayad and Rabi* seasons. Women of Padli were efficiently doing kitchen gardening which contributes maximum nutritional meals in their daily Nutri -thali with fruits. Production of vegetables at beneficiaries increased 193.27 percent which resulted in increased consumption (89.55%) and distribution (450 %) and money saving. Many Household women started kitchen garden and achieve nutritional food security. Above study reveals cereals increased by 223.12, pulses by 39.00, green leafy vegetables 50.00, root tubers by 72, fruits by 50.3. Table further depicts that after intervention farming families receive energy 1945, fat 21.00, calcium 382, Iron 16.00, B carotene 3120, Vitamin C 35. Kitchen gardens predict as best source of nutritional and Food security in contexts of Accessibility, Replicability and Utility. Accessibility as Kitchen gardens are helpful to provide nutritional & economically advantages. Nutritionally & economically beneficial for farm families & Urban Households. Replicability as Kitchen gardening are only given at KVK campus. Utility as by growing kitchen gardens a family can save about 50 thousand rupees yearly.

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Deaths from protein-energy malnutrition, by age - Our World in Data

Jump up to: <sup>a b c</sup> "Dietary Reference Intake: The Essential Guide to Nutrient Requirements" published by the Institute of Medicine and available online at <https://www.nap.edu/read/11537/chapter/14?term=protein-energy+malnutrition#151>

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Comment [Ma7]: Meaning in english

Comment [Ma8]: This is from Wikipedia. To be corrected

*Metabolic*

*Care. 12 (4):*

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ICMR,Guidelines e-mannual,2017.#(ICMR,2017)\*\*Nutrition to Women Between 18-45 years of Age.

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