



Nutritional Food Security of Households Through Establishment of Kitchen Garden in Mayurbhanj District of Odisha

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ABSTRACT

Mayurbhanj is a tribal population dominated district of Odisha constituting 58.7 per cent of the tribal people and was declared as the fully scheduled district of the state. In villages of Mayurbhanj district, the major problems are poor health status, malnutrition causing growth retardation, reduced work output, social and retarded mental development and high morbidity and mortality rate among the population. In order to improve food and nutritional security of family members, KVK, Mayurbhanj-1 demonstrated FLD on Kitchen gardening during 2018-19, 2019-20 and 2020-21. It was found that the production of vegetables of respondents increased by 586.2 per cent resulting increase in consumption of vegetable by 48.81 per cent and subsequently vegetable purchasing decreased by 32.1%. It was also seen that apart from economic saving on vegetable consumption, kitchen gardening also provided them a livelihood support enterprise for fighting against malnutrition and poverty by providing them an additional income and empowerment to women. Likewise, intake of energy, protein and iron increased significantly after introduction of kitchen garden ($p \leq 0.05$).

Key Words: Nutrition, Health status, Malnutrition, Kitchen gardening.

INTRODUCTION

Mayurbhanj is a tribal population dominated district of Odisha. The tribal population is more concentrated in five blocks such as Udala, Khunta, Bijatola, Jamda and Baripada blocks where the population differs from 70-80 percent of the total population of the respective blocks. Along with this hill Khariar, Birhor (Mankirdia) and Lodha are the three types of particularly vulnerable tribal groups seen in this district required special attention from social, financial and nutritional point of view. In villages of Mayurbhanj district, the major problems are poor health status, malnutrition causing growth retardation, reduced work output, social and retarded mental development and high morbidity and mortality rate among the population. Majority of the tribal families are small and marginal and rice is the main food group in their daily diet which serving as important source of energy to their

body. Large populations of children and women in Mayurbhanj district suffering from micronutrient deficiency diseases *viz.*, anaemia, night blindness, keratomalacia, spongy bleeding gums, cheilosis, sore throat, angular stomatitis and scurvy etc.

Vegetables play an important role in human diet and rural mass should get the awareness about the importance of vegetable in the daily diet (Jain, 2017). Kitchen garden provides fresh fruits and vegetables round the year at our hand along and fulfils the micronutrients requirements of the body. Establishment of Kitchen Garden in rural areas is easy due to availability of space and farm families are already engaged in agriculture practices (Arya *et al*, 2018). There are many social benefits that have emerged from kitchen gardening practices; better health and nutrition, increased income, employment, food security within the household,

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Table 1. Socio economic status of the respondents.

Variable	Category	Number	Percent (%)
Type of family	Joint	8	26.7
	Nuclear	22	73.3
Size of family	Small (1-4)	12	40
	Medium (5-7)	12	40
	Large (>7)	6	20
Annual Income (Rs.)	50000	13	40.3
	50,000 – 1,00,000	7	20.3
	>1,00,000	10	30.4
Education	Illiterate	9	30
	Primary	6	20
	Middle	12	40
	Graduation	3	10
Land holding	Small (< 2ha)	12	40
	Medium (2-5ha)	14	46.7
	Large (5ha)	4	13.3

and enhance in community social life (Awasthi *et al*, 2016). Hence, kitchen garden would be a nice and easy way to improve household food security, health and nutritional status of a family (Rani *et al*, 2015 and Thakor *et al*, 2020). Krishi Vigyan Kendra, Mayurbhanj-1 conducted FLDs during 2018-19, 2019-20 and 2020-21 in different villages in Mayurbhanj district to enhance the nutritional and household food security of the incumbents.

MATERIALS AND METHODS

The present study was conducted in 11 villages i.e., Kadalibadia, Badakhaladi, Machhia, Kansapal, Sirisabani, Dhanpur, Ambdubi, Karanjia, Gargaria, Bholagadia and Jualirama to improve the nutritional security of the family members through development of kitchen garden near to their houses. A total of 30 numbers of families were selected constituting 30 farm women. Different capacity building activities including training, exposure visit and farmer-scientists interaction on different aspects including modern ways of vegetable production, homestead vegetable production, planning and layout of nutritional gardening were planned and carried out. The farm women were guided and advised about

proper planning and lay out of a kitchen garden in scientific and organic way, so that all the seasonal vegetables could be grown fresh and thus available to farm families at any time to their hand. Use of high yielding varieties of different vegetable crops such as Leafy vegetables, Radish, Carrot, Tomato, Brinjal, Cabbage, Cauliflower, Capsicum, Chilli, Okra, Cucumber, pumpkin etc in kitchen garden. The unit size of the garden was 200 m². The nutritional education was also given while planning the kitchen garden. The methodology for this study included both qualitative and quantitative components based on house hold surveys and focus group meeting. Base line survey was conducted to obtain basic information such as socio-economic status, dietary food habits and practices and nutritional deficiency diseases. In order to assess the impact of nutritional garden an end line survey was conducted in the study sites. End line survey was structured on the line of base line for comparison purpose. Total amounts of vegetables produced per family were recorded average were calculated and recorded. The collected data were analysed using Microsoft Excel data analysis. Statistical procedures included paired t test (Snedecor and Cockran, 1989).

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Table 2. Changes occurred by intervention of kitchen garden.

Parameter	Production (Kg)	Purchase (Kg)	Distribution/Sale	Consumption (Kg)
Before intervention	55	321	00	379
After intervention	398	218	52	564
Change	340	-103	52	185
Percent Change	586.2	32.1	--	48.81
T value	-35.1596	12.894	-22.6934	-11.5054
P value	0.000*	0.000*	0.000*	0.000*

*significant at $P \leq 0.05$

RESULTS AND DISCUSSION

The present study revealed the socio-economic status of the selected village of the Mayurbhanj district (Table 1). It was observed that 73.3 per cent of the respondents come under nuclear family followed by 27.7 per cent under joint family. Equal percentage of family (40%) belongs to small and medium family whereas 20 per cent of the family comes under large category. In the study about 40.3 per cent of the family belonged to the income group

of less than 50,000/- followed by 30.4 and 20.3 per cent under more than income of Rs. 100,000/- and income in-between 50,000 and 100, 000/- respectively. As far as education is concerned, the study revealed that 30 per cent of the respondents were illiterate while 40 per cent of the respondents studied upper primary and high school (middle) followed by 20 per cent under primary education and 10 per cent were graduate. Majority of them comes under medium (46.7%) and small (40%)

Table 3. Average vegetable production and income from nutritional garden.

Name of vegetable	Vegetable Production (kg)	Vegetable Production (kg)	Vegetable Production (kg)	Average Production	Average price / kg(Rs.)	Average Total Income (Rs.)
	2018-19	2019-20	2020-21			
Leafy vegetables (Spinach)	8.15	7.25	8.35	7.92	25.00	162.00
Radish	38.5	39.25	37.85	38.53	10.00	340.00
Carrot	21.25	19.45	19.85	20.18	15.00	280.00
Tomato	59.63	58.45	59.65	59.24	10.00	564.00
Brinjal	64.45	65.65	64.58	64.89	10.00	625.00
Cabbage	48.34	47.45	47.93	47.91	20.00	930.00
Cauliflower	35.6	34.7	37.5	35.93	15.00	510.00
Capsicum	9.35	10.45	12.43	10.74	25.00	248.00
Chilli	12.3	11.4	11.8	11.83	30.00	324.00
Okra	12.5	13.4	11.8	12.57	8.00	80.00
Cucumber	21.1	19.3	18.3	19.57	10.00	178.00
Pumpkin	18.3	19.3	19.6	19.06	7.00	113.00
TOTAL	345.47	339.05	343.64	342.72		4354.00

Table 4. Per capita availability of nutrients before and after intervention.

Nutrients	Per capita availability of nutrients/day		% Recommended Dietary Allowance		Difference (%)	T	p
	Before	After	Before	After			
Energy (Kcal)	124	278	6.52	14.63	+ 8.11	-45.7031	0.000*
Protein (g)	3.13	5.89	5.69	10.70	+ 5.01	-38.3728	0.000*
Beta carotene (mg)	2108	4014	43.9	83.6	+ 39.7	-51.2529	0.000*
Folic acid (mcg)	16.5	43.43	8.25	21.7	+13.45	-70.9089	0.000*
Calcium (mg)	118.9	308.5	19.8	51.4	+ 31.6	-48.9633	0.000*
Iron (mg)	2.12	7.32	10.09	34.8	+ 24.71	-53.448	0.000*
Vitamin C (mg)	42.34	48.52	105.85	121.3	+ 15.45	-14.225	0.000*

*significant at $P \leq 0.05$

land holding category. Only 13.3 per cent of the respondents have more than 5 ha of land i.e. large farmers.

The change in production and consumption of vegetables of respondents are depicted in Table 2. In traditional practices they cultivated 2-3 different vegetables such as brinjal, okra and tomato during whole the year. For fulfilling their daily requirement of vegetables, they mainly depended on the market. After intervention, they had grown 10-12 types of seasonal vegetables such as leafy vegetables, radish, carrot, tomato, brinjal, cabbage, tomato, cauliflower, chilli, capsicum, cucumber and pumpkin during both in *Kharif* and *Rabi* seasons. The study revealed that there was an increase in production, consumption, distribution / sale of surplus vegetables to near friends and relatives after intervention of nutritional garden by KVK. Comparison of data on before and after intervention showed a significant improvement in production, distribution and consumption of vegetables ($P \leq 0.05$). Purchase of vegetables also reduced significantly ($P \leq 0.05$). It was very clear from table 2 that the production of vegetables of respondents increased by 586.2 per cent which led to enhanced consumption of vegetable by 48.81 per cent and subsequently vegetable purchasing decreased by 32.1 per cent. The present finding showed similarity with findings of Nandal and Vaishisth (2009), Chayal *et al* (2013) and Verma *et al* (2019).

The average vegetable production during the year 2018-19, 2019-20 and 2020-21 is given in Table 3. The total average production of eleven villages was 342.72 kg during both the seasons. By considering the local available market price, the average income of Rs 4354/- was recorded as the economic benefit to the individual family which was in conformity with the findings found by Verma *et al* (2019). It was concluded that apart from economic saving on vegetable consumption by adopting kitchen garden, it also provided them a livelihood support enterprise for fighting against malnutrition and poverty by providing them an extra income and empowerment to women.

The data presented in table 4 revealed that after introduction of nutritional garden, the per capita availability of the nutrients per day increased which contributed towards the good health. Nutritional values of different vegetables were calculated as per the procedures of Gebhardt and Robin (2002). The data (Table 4) indicated that there was significant increase in consumption of beta carotene, folic acid, calcium and vitamin C ($p \leq 0.05$). These findings were supported by the findings of Yusuf *et al* (2008) and Chayal *et al* (2013). It was also found that intake of energy, protein and iron increased significantly after introduction of kitchen garden ($p \leq 0.05$). Similar resulted were obtained by Singh *et al* (2018) and Nandal and Vaishisth (2009).

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CONCLUSION

Promotion of kitchen garden had played a major role in combating the malnutrition and related problems in unreachable and interior areas of Mayurbhanj a tribal dominated district of Odisha. The intervention on kitchen garden was very much adoptable and successful model for empowerment of women and not only women but also a farm family for fighting against malnutrition and poverty among tribal people of inaccessible areas. Over a short period of three years significant increase in the quantity and consumption of vegetables suggests a positive trend as well as acceptance of the technology in the selected villages. It may be concluded that establishment of kitchen garden had immense role in tackling the problem of malnutrition and micronutrient deficiencies in rural areas. Hence it is recommended that concept of kitchen garden should be reached to every women and farm families whether through government or non-government agencies.

REFERENCES

- Arya S, Prakash S, Joshi S, Tripathi K M 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.
- Awasthi N, Sahu AC and Singh A K (2016). Household Food Security through Kitchen Garden: A Practically Workable Step by KVKs in U.P. State. *Adv Social Res* 2(1): 49-51.
- Chayal K, Dhaka B L, Poonia M K and Bairwa R K (2013). Improving nutritional security through kitchen gardening in rural areas. *Asian J Home Sci* 8(2): 607-609.
- Jain S (2017). Development and field-testing of a flipbook on vegetables in diet for rural women. *J Comm Mobil Sust Dev* 12(1): 136-140.
- Landauer K and Brazil M (1985). Tropical home gardens. Selected papers form an international workshop at the Institute of Ecology, Padjadjaran University, Indonesia, United Nations University Press, December 1985, JAPAN.
- Nandal J K and Vashisth S (2009). *Sustainable household food security through nutrition gardens*. In: Proceeding International conference horticulture: 1966-1967.
- Rani Sudha K, Suprajal T and Reddy Lakshmi P (2015). Nutrition intervention and homestead kitchen gardening improving nutritional security in rural livelihoods. *J Krishi Vigyan* 4(1): 63-66.
- Snedecor G W, Cochran W G (1989). *Statistical Methods*, 8th Edition, Iowa State University Press.
- Singh V, Yadav K S and Tripathi A K (2018). Kitchen Gardening: A promising approach towards improving nutritional security in rural households. *Int J Microbiol Res* 10 (5):1216-1219.
- Thakor R F, Ahir P R and Kapur L T (2020). Nutri-garden models for household nutritional security in tribal areas of Valsad. *J Krishi Vigyan* 9(1): 254-259.
- Vats C (2015). Promotion of neglected old crops for nutritional security. *J Krishi Vigyan* 4 (1): 76-79.
- Verma N, Pathak R, Dubey M, Kumar S, Dixit H and Bharti P (2019). Improvement in nutritional security of tribal families through kitchen gardening in remote areas of the Dindori district (MP), India. *Plant Archives* 9 (Supplement1): 1077-1079.
- Yusuf A M, Mustaque A M and Badirul I M (2008). Improving nutritional security through kitchen gardening. In: Proceeding of National workshop on multiple cropping held at Bangladesh Agricultural Research Council, Farmgate, Dhaka, Bangladesh on 23-24 April, 2008.

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