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Research Paper

Economic analysis of kitchen gardens at farmers' doorsteps

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ABSTRACT : Kitchen gardening plays an imperative role for rural families to recover diversified vegetables in their daily diet. KVK Faridkot demonstrated the kitchen gardening amongst 100 families of two villages namely Pindi Blochan and Bhagthala Kalan to analyze the economic impact of the alleged technology along with constraints faced by the growers. The demonstrations on kitchen gardening have paved the way for healthier, long, prosperous and biodegradable life of the rural folk. The results revealed that there was total income of Rs. 2316.20/- from *Rabi* vegetables and Rs. 2003.9/- from K*harif* vegetables. The total vegetable income was Rs. 4320.10 from an area of 500 m^2 in three months span. These vegetables were produced with minimal use of chemicals. However, there are certain bottlenecks in successful adoption of kitchen gardening. Overall analysis revealed that brackish irrigation water, high soil pH and EC, limited availability of seed in the form of vegetable kits, lack of awareness regarding varieties and management of insect-pest and diseases and limited knowledge regarding preparation of quality farm yard manure were amongst the serious constraints as perceived by the growers.

KEY WORDS : Kitchen gardening, Economic analysis, Constraints, Adoption

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INTRODUCTION :

Food security and nutritional diversity is one of the key areas that a developing country like India should address. With varying local opportunities and challenges, the kitchen garden forms a panacea that can address food insecurity and bring in self reliance, sovereignty and dignity. Households have labour power– the physical ability of household members to generate income (Christopher, 2006). When this labour power is used in the Kitchen garden it has the ability to improve food security and nutritional diversity of the household. Even with the dwindling land resource small areas around the house can make the difference in the lives of many.

Continuously increasing food prices of basic kitchen items, fruits and vegetables, the poor and fixed income groups are suffering from the decreasing real incomes and purchasing power. The marginal increase in the income of the poor people to enable them to gain access to food and improve their nutrition is the need of the

present time. In cities and urban areas where there is shortage of land for farming and over-population, areas of land around the house that tend to be useless, overgrown by weeds and turned to refuse dump could be means of ensuring household food security and nutrition if properly harnessed. With increasing civilization and western education, kitchen gardens are being incorporated into modern houses for easy and quick access to fresh food produce and products (Sanogo, 2007).Kitchen gardens can be grown in the empty space available at the backyard of the house or a group of women can come together, identify a common place or land and grow desired vegetables, fruits, cereals etc that can benefit the women and community as a whole (Christensen, 2011). There are many social benefits that have emerged from kitchen gardening practices; better health and nutrition, increased income, employment, food security within the household and community social life. Households and small communities take advantage of vacant land and contribute not only to their household food needs but also the needs of their resident city (Drescher, 2000).

Vegetables occupy an important place in our daily life particularly 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 85g of fruits and 300 g of vegetables per day according to the dietary recommendation of nutrition specialists. The vegetables include (green leafy vegetables = 50 g, other vegetables = 200 g, roots and tubers = 50 g). But the present level of production of vegetables in our country can permit a per capita consumption of only 120 g of vegetables per day. This deficiency can be ameliorated through kitchen gardening. Most of the developed countries are doing the successful kitchen gardens which are not accidental. They are the results of planning, constant care, and the will to make things grow. Among the many things a vegetable garden may offer toward a satisfying experience are fresh air, exercise, sunshine, knowledge, supplemental income, mental therapy and fresh food, rich in vitamins and minerals, harvested at the best stage of maturity. On the contrary, developing countries like India are yet to harness the benefits of kitchen gardening. Looking at the importance of kitchen gardening there is a need of sound policies, effective agricultural research and technology that can help to bring the unit cost saving productivity and increase in food production.

In India, one of the consequences of the green revolution was that it brought in mono-cropping leading to a drastic reduction of crop diversity of farm lands. This shift in agriculture focusing on a market-driven economy where cash crops took precedent had its toll; household needs for a range of cereals, pulses and vegetables were not met from the farm but purchased from the market. This food insecure group needs to face the *c*urrent environmental and health challenges by identifying ways to better align aesthetics, ecology and health (Denver, 2012). A kitchen garden can be a part of the solution to this problem.

The higher demand for food should be met by practical innovations like kitchen gardening which not only improves availability but also answers the question of diversity required for a healthy community. A kitchen garden involves the very people who are the greatest resource for development in a view to improve their own livelihoods and empowerment as envisaged in the rural university concept (Mathai, 1985). It is perhaps the only available ecological space available to the poor to meet their economic needs especially so in India, where the poor tends to rely more on natural resource base for their livelihood.Gardening benefits both individuals and neighborhoods and thus contributes to overall community health. The benefits of food production transcend the physical, mental and emotional health of the individual to leave lasting change on others and on the physical and social space of the community (Armstrong, 2000)

In addition to supplying the food needs, the kitchen gardens help in biodiversity conservation as well as a platform of socializing the younger generation into the communities' norms as they interact with the older people while tending the gardens. While it may not directly supply the cereals need for the family, the savings achieved from not buying fruits and vegetables would be used to fulfill other basic amenities apart from fulfilling nutritional security. Realizing the importance of kitchen gardening in modern times, an effort was made to study the economic viability of kitchen gardening units at farmers' door steps. Emphasis was laid on identifying the major bottlenecks in adoption of recommended kitchen gardening techniques.

MATERIALS AND METHODS :

Present investigations on kitchen gardening were carried out in two villages namely Pindi Blochan and Bhagthala Kalan of Faridkot district in the year 2015.

Hundred demonstrations were conducted in two villages. These farmers/farm women were supplied with vegetable kits for both the summer and winter season vegetables. The kits comprised of seed of vegetables *viz.*, peas, carrot, radish spinach, coriander, metha, methi in winters and okra, sponge gourd, bottle gourd, bitter gourd, etc in summer, Out of 100 farmers/farm women, ten farmers/ farm women were randomly selected from the aforesaid villages for studying economic viability of kitchen gardens. For judicious use of fertilizers, soil and water testing of demonstration plots was carried out. Farmers/farm women were advised to use organic manures, *i.e.* FYM to meet the fertilizer requirement of vegetable crops and to practice hand hoeing for weed management. Manual as well as mechanical methods were to be preferred over the chemical methods of pest control. Chemical control measures were advised to be used need based and as last resort. As the primary objective of conducting kitchen gardening demonstration was to wean away farmers from buying vegetables from market, retail market price of the produce was taken for calculating average returns from these demonstrations. Yield of vegetables was recorded to calculate economic returns from the units.

To popularize the concept of kitchen gardening by removing the various bottlenecks, emphasis was laid on studying the constraints perceived by the growers. In the present study, constraint was conceptualized as irresistible force that acts as hindrance in adoption of recommended kitchen gardening techniques. A list of major constraints was prepared in consultation with extension scientist, available literature, field functionaries and progressive vegetable growers. Further, the major constraints were categorized into suitable sub-heads *viz.*, input, technical, socio-cultural, post-harvest and general constraints.

The primary data for studying the constraints were collected from 100 farmers with the help of interview schedule. The constraints as perceived by respondents were scored on the basis of magnitude of the problem as per Meena and Sisodia (2004). The scores of respondents were recorded and converted into mean per cent score and constraints were ranked as per Warde *et al*. (1991).

RESULTS AND DATA ANALYSIS :

The average yield and economic returns obtained from winter and summer vegetables produced by ten randomly selected farmers are depicted in Tables 1 to 3.

It is clear from the data that from an area of 500 m^2, on average basis the selected families were able to produce 247.1 kg of *Rabi* vegetables and 170.5 kg of *Kharif* vegetables. The cumulative yield of vegetables from 10 families was 417.6 kg.

Thus, there was total income of Rs. 2316.20/- from *Rabi* vegetables and Rs. 2003.9/- from *Kharif* vegetables. The total vegetable income was Rs. 4320.10 from an area of 500 m^2 in three months span. Thus, in six months period one can produce vegetable worth Rs. 8640.20/- (4632.40/- from *Rabi* and 4007.80/- from *Kharif*) from 500 m^2 area under vegetables. It was observed that yield obtained in demonstrations was less than the potential yield of vegetables. It might be due to the fact that farmers

Table 1: Average yield from winter season (*Rabi*) vegetables grown in kitchen gardens on 500 m^2 area

Sr. No.	Vegetable yield (kg)									Cumulative yield (kg)
	Spinach	Coriander	Peas	Methi	Metha	Chinese cabbage	Carrot	Radish	Turnip	
1.	47	10	18	6	9	31	40	65	22	248
2.	45	9	24	12	13	32	25	59	35	254
3.	30	16	19	10	12	31	28	50	38	234
4.	44	20	14	9	11	45	24	51	29	247
5.	29	10	22	6	8	32	23	54	38	222
6.	31	8	23	19	8	38	28	61	37	253
7.	30	18	20	9	11	37	29	54	33	241
8.	50	9	14	7	17	35	24	55	21	232
9.	42	19	25	13	8	45	43	51	22	268
10.	44	20	22	15	12	41	29	63	26	272
Total	392	139	201	106	109	367	293	563	301	2471
Average	39.2	13.9	20.1	10.6	10.9	36.7	29.3	56.3	30.1	247.1

were advised to use minimum pesticides in these demonstrations as the produce is meant for their home consumption. Another reason may be that some of selected farmers might not have followed the recommended package of practices timely and completely.

The data presented in Table 4 depicted that amongst in-put constraints, brackish irrigation water was the most serious constraint as perceived by the growers and was ranked on Ist position (79.6 %) followed by limited availability of quality seed of vegetables in the form of kits (77.7 %). Under technical constraints, lack of knowledge regarding improved varieties, seed rate and sowing time and lack of knowledge regarding management of insect-pests and diseases were the major constraints. This is due to the fact that farmers are generally swayed away by unscrupulous dealers and they generally opt for varieties and chemicals at the behest of those dealers.

Table 2 : Average yield from summer season (*Kharif*) vegetables grown in kitchen gardens on 500 m^2 area

Sr. No.	Vegetable yield (kg)							Cumulative yield (kg)
	Bitter gourd	Okra	Cowpea	Sponge gourd	Bottle gourd	Tinda	Radish	
1.	25	28	24	24	29	14	10	154
2.	27	33	29	45	34	8	19	195
3.	21	29	29	35	48	13	13	188
4.	16	34	23	33	42	13	8	169
5.	22	29	23	24	41	14	9	162
6.	23	29	33	31	48	25	13	202
7.	19	24	25	29	52	13	11	173
8.	21	23	26	16	29	5	8	128
9.	26	34	39	36	37	13	14	199
10.	18	28	21	12	42	6	8	135
Total	218	291	272	285	402	124	113	1705
Average	21.8	29.1	27.2	28.5	40.2	12.4	11.3	170.5

Table 3 : Economic analysis of vegetable production under kitchen garden

Sr. No.	Season	Name of crop	Average yield (kg)	Market rate (Rs. per kg)	Average income (Rs.)
1.	***Rabi* vegetables**	Spinach	39.2	5	196
2.		Coriander	13.9	8	111.2
3.		Pea	20.1	20	402
4.		Methi	10.6	10	106
5.		Metha	10.9	10	109
6.		Chinese cabbage	36.7	8	293.6
7.		Carrot	29.3	8	234.4
8.		Radish	56.3	10	563
9.		Turnip	30.1	10	301
Total *Rabi* vegetables					2316.20
1.	***Kharif* vegetables**	Bitter Gourd	21.8	16	348.8
2.		Okra	29.1	13	378.3
3.		Cowpea	27.2	11	299.2
4.		Sponge gourd	28.5	13	370.5
5.		Bottle gourd	40.2	8	321.6
6.		Tinda	12.4	13	161.2
7.		Radish	11.3	11	124.3
Total *Kharif* vegetables					2003.9
Total income from vegetables (three months period)					4320.1

Another important constraint was lack of awareness about how to prepare quality FYM in pits (70.2 %). Whatever FYM was available comprised of cow and buffalo dung heaped in open spaces having higher weed infestation. The data presented in Table 4 further depicted that lack of interest among rural youth was the most seriously perceived socio-cultural constraint (70.0%). This is due to the fact that rural youth are lured by the charm of urbanization. Moreover, the parents prefer their wards to be doctors and engineers instead of farmers. The fear of theft of farm produce was perceived as second most important socio-cultural constraint (68.6%) followed by lack of involvement of household women in kitchen gardening (65.0%). Rural women, generally, avoid such tasks due to social stigma. According to Heyzer and Sen (1994), "Women are seen as having to balance several roles in coping with poverty and having to devise numerous survival strategies. Hence, in the generation of economic opportunities for the poor, there is need to target resources to women (Krems *et al*., 2004)

The data further depicted that difficulty in selling small amount of surplus produce (67.2%) and lack of knowledge regarding preservation and processing of surplus produce (65.0 %) were important post –harvest constraints. Amongst general constraints, lesser priority to kitchen gardening than other farm activities and high soil pH and EC were serious constraints high soil pH and EC adversely affected the overall performance of vegetable crops as these crops are highly sensitive to high soil pH and EC. The results of present study were in conformity with those of Kanbid and Sharma (1994); Sisodia and Rathore (2004); Kumar *et al.* (2011) and Sethy *et al.* (2010).

Conclusion :

Economic analysis revealed that kitchen gardens can be a panacea to the vulnerable households in providing a form of food security and nutritional diversity. Disposal of organic waste, which is a big headache, can also be eased, as the organic waste would be used to fertilize

Table 4 : Perceived constraints in adoption of improved kitchen gardening techniques

Sr. No.	Particulars	MPS	Rank
Input constraints			
1.	Brackish underground water	79.60	1
2.	Limited availability of seed of seasonal vegetables in the form of kits	77.70	2
3.	Lesser availability of bio pesticides and bio-fertilizers	71.00	3
	Overall	76.10	
Technical constraints			
1.	Lack of knowledge about improved varieties, seed rate and sowing time	79.40	1
2.	Lack of knowledge regarding major pests and diseases, their identification and management	77.10	2
3.	Lack of knowledge about recommended fertilizers and how to prepare quality FYM	70.20	3
	Overall	75.56	
Socio-cultural constraints			
1.	Lack of interest among rural youth	70.00	1
2.	Fear of theft of kitchen garden produce	68.60	2
3.	Lack of involvement of household women in kitchen gardening	65.00	3
	Overall	67.87	
Post-harvest constraints			
1.	Difficulty in selling small amount of surplus produce	67.20	1
2.	Lack of knowledge regarding preservation of vegetables	65.00	2
	Overall	66.10	
General constraints			
1.	Lesser priority is given to kitchen gardening than other farm activities	77.20	1
2.	High soil pH and EC	74.00	2
		75.60	

the organic kitchen gardens. However, there are certain constraints in successful adoption of kitchen gardening. It can be concluded that input constraint was the most serious constraint. General and technical constraints were at par followed by socio-cultural constraints and postharvest constraints Overall analysis revealed that brackish irrigation water, high soil pH and EC, limited availability of seed in the form of vegetable kits, lack of awareness regarding varieties and management of insect-pest and diseases and limited knowledge regarding preparation of quality farm yard manure are the major bottlenecks in successful adoption of kitchen gardening. The impact of kitchen gardening was very positive as it gave healthy and nutritious food to the household members and also helped in reducing financial burden and keep them healthy and active. As it is a fruitful activity to get fresh and nutritious vegetables so people must adopt it to harness the immense benefits.

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