

## Food Security and Socio-Economic Conditions of Women Involved in Kitchen Gardening in Muzaffargarh, Punjab, Pakistan

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### Article History

#### Received

December 10, 2015

#### Published Online

May 18, 2015

#### Keywords:

Livelihood,  
Kitchen gardening,  
Socioeconomics,  
Food Security,  
Gender,  
Urban farming

**Abstract:** Evaluation of the effect of kitchen gardening on food security and socio-economic conditions were made after imparting training to poor women of Muzaffargarh. Assessment after training showed that the women who participated in the training were more aware about growing of vegetables timely and with proper management for higher production. Economically they became capable of saving the money incurred in terms of buying vegetables from the market. Also they were able to grow the vegetables organically without polluting the environment with agrochemicals residues. Most of the participants extended their activity and they started to grow vegetables not only for their domestic requirement but also to sale their produce in markets to increase their family income. Due to this exercise the women became able to identify the beneficial and harmful insects which also help them to use the insecticides safe for beneficial insects. This training also has the positive impact on social and economic life of the women community by increasing their income and providing them chances to have close interaction with each other.

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**Cite this article as:** Bajwa, B.E., M. N. Aslam and A. H. Malik. 2015. **Food security and socio-economic conditions of women involved in kitchen gardening in Muzaffargarh, Punjab, Pakistan.** *Journal of Environmental & Agricultural Sciences*. 4:1-5.

### 1. Introduction

Pakistan is an agricultural based developing country. Agriculture is the main source to meet the food requirement of the speedy growing population. According to an estimate Pakistan will become world 4<sup>th</sup> largest nation in 2050 which is an alarming situation for it to meet the food requirement (Munir et al., 2010). In order to dilute the food security threat one option is to start Kitchen gardening for each house hold. It contributes to achieve food security of by offering direct access to food that can be harvested to feed the family on daily basis. It is an easy production system for the poor. This activity is not only useful to save time and money but also gives useful, healthy and environment friendly activities to the families (Cheema, 2011). Food security means insurance of adequate supply of basic goods to meet essential demand and alleviate instabilities by all people for active life span (Ahmad et al., 2015).

Kitchen gardening is preferred form of activity for all gender, age and ethnicity groups (Krems et al., 2004). It is also cost effective as nutrition intercession (Popkin et al., 1980; Brownrigg, 1985). A little garden of mixed vegetables can be the significant source of dietary allowance as iron, protein, calcium, vitamin A and Vitamin C (Marsh and Talukder, 1994; AVRDC, 1989).

Women work activities are primarily nonmarket household production, whereas men are engaged in

paid market activities. Gendered division of labor is evident, and women's work remains outside the formal economy. Significant gender based differences among the gardeners has been reported including access to resources, division of labor, benefits and challenges encountered and marital status (Ngome and Foeken, 2012).

The major factor that determines gender differences in economic and social roles is the difference in the division of labor. The relationship to the means of production is also highly gendered, and women bear a disproportionate responsibility for unpaid household work, whereas men are largely engaged in paid market work social roles is the difference in the division of labor (Siddiqui, 2005; Raza and Murad, 2010)

Women are around half (48.65%) of Pakistan's total population (Economic Survey of Pakistan, 2014). There are significant socio-demographic and cultural factors, due to which gender gap persists in Pakistani society. Gender gap exist in access to resources, decision making, population, health, education, political, and economic empowerment. (Raza and Murad, 2010; Noureen, 2015).

Muzaffargarh is located in southwestern Punjab Pakistan. Its area is 8,249 km<sup>2</sup> and forms strip between rivers Indus and Chenab. Most of the area of the district is agricultural and major vegetable grown are carrots, cauliflower, and onion while other vegetables include turnip, lady fingers, potato,

tomatoes, garlic and chilies. In 2010, Muzaffargarh district was hard hit with severe flood from these two rivers which further deteriorate the economic conditions of its poor (Solberg, 2010; Polastro et al., 2011; Lau and Kim, 2012; Hashmi et al., 2012). Generally it ranks lower on Human Development Index (HDI) due to repeated floods, feudal system, increasing poverty, lower level of education and high population.

Keeping in view the socio-economic conditions of the peoples of this district the present project was launched in order to enhance the social status of female kitchen gardeners and to reduce the poverty level of its poor.

## **2. Material and Methods**

The study was conducted in district of Muzaffargarh, Punjab, Pakistan. It has an arid climate with mild winter and very hot summer with a high temp up to 54 °C. Most of the area of the district is agricultural and major vegetables grown are carrots, cauliflower, and onion while other vegetables like turnips, lady fingers, potatoes, tomatoes, garlic and chilies are also grown.

The project focused only on young energetic women. By working directly with local communities, the CABI team enhanced the skills of targeted group and enabled them to generate income through self-employment. The team through described below a completely developed training program has conducted regular classes regarding kitchen gardening and trained 250 individuals.

### **2.1 Sample collection**

From two tehsils i.e., Kot Adu and Muzaffargarh of district Muzaffargarh five villages from each tehsil were selected at random. Villages from Kot Adu includes Karmdad, Khajiwala, Sheraywala, Basti Poni and Basti Meerwala, whereas Yaruwala, Ghehnaywala, Goddar Chowk, Rodanwala and Diganaywala were villages from Muzaffargarh. These villages were characterized with the strong feudal system, higher poverty and illiteracy levels and low family incomes. Only female participants were selected with age group of 15 to 40 years with education level of primary to matriculation.

### **2.2 Establishment of training centers.**

The training centers were established in 10 selected villages with 25 participants in each center and with one master trainer.

### **2.3 Curriculum design**

The curriculum was designed on need based criteria considering the local need of community

women regarding food security, nutrition, financial status, education level, social norms and contribution in agriculture, livestock, interest and the availability of time for this training. Keeping in view the above mentioned factors, the activity was designed five days a week and 6 hours daily comprising of 20% theory and 80% practical work.

According to the duration of the crop, the training started from pre-sowing to harvesting and marketing of the crop. Before the start of the activity, a pre-evaluation test was conducted to understand the knowledge of the participants about the parameters like kitchen gardening, vegetables of summer and winter, identification of vegetable seeds, preparation of seed bed, time of sowing, nursery raising, sowing methods, transplantation techniques, thinning of plants, hoeing, irrigation, impact of organic matter, identification of diseases and weeds, harmful and beneficial insects of the vegetables and their management, harvesting time and storage practices of different vegetables. After obtaining the said information by the farmers the main focus was to strengthen the weaker side of the participants.

### **2.4 Training methodology**

On the basis of the participant's education level, the training was focused as non-formal education. In this approach learning by participatory approach, insect zoos, watering, fertilizer application and sowing methods were focused. To increase the interest of the participant's different group dynamics and ice breakers were also included in the training.

Another technique of learning through Agro Eco System Analysis (AESAs) was also adopted. This technique not only improve their skills regarding decision making, critical observations, drawing on the charts but also the presentation and discussion skills.

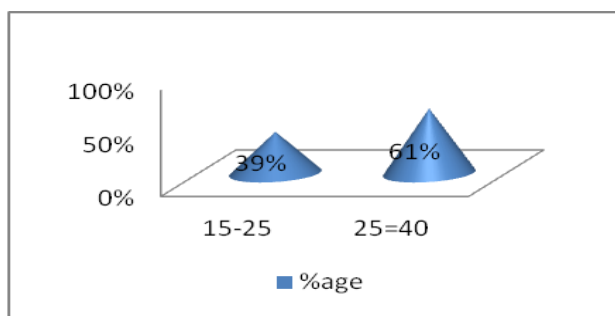
On the basis of critical analysis through AESAs the decisions were taken for vegetable plants on weekly basis. Collective decisions were implemented on the plants for getting better results.

### **2.5 Social change**

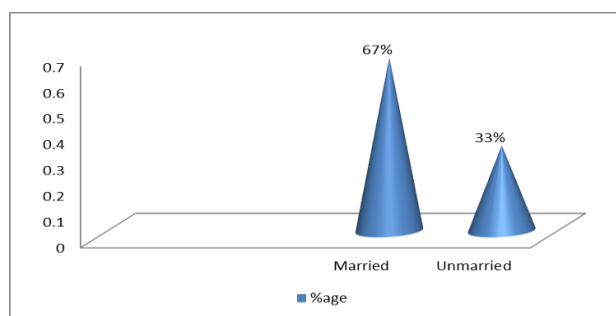
To increase the social interaction among the women community, the training provided the platform where 25 women get together five days a week and had the opportunity to learn from the training as well as to enhance the social interaction with each other. The women were empowered through capacity building to increase their income generation and to execute their own kitchen expenses at household level.

**Table 1 Effect of training on different assessment parameters in villages of Tehsil Kot Adu**

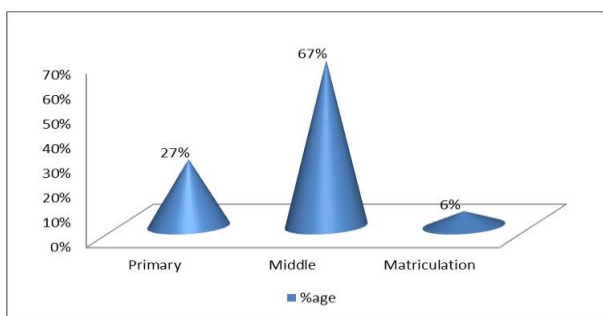
Villages Parameters	Karmdad			Khajiwala			Sheraywala			Basti Poni			Basti Meerwala			Average %age
	Pre	Po	% increase	Pre	Po	% increase	Pre	Po	% increase	Pre	Po	% increase	Pre	Po	% increase	
Knowledge about Kitchen Gardening	36	81	36.6	45	88	36.9	36	87	45.6	53	92	34.4	48	86	30.2	36.7
Rabi vegetables	38	80	32.5	58	94	32.3	53	93	36.0	46	87	34.1	57	94	33.4	33.7
Kharif vegetables	48	89	35.1	57	91	28.4	46	86	32.5	38	83	37.2	43	83	31.2	32.9
Seeds Identification	43	87	37.6	49	93	40.3	39	86	40.7	49	86	29.0	39	86	40.7	37.6
Seed rate for vegetables	46	89	37.3	39	87	42.2	47	89	36.2	37	80	33.8	40	78	26.7	35.2
Plant to Plant distance	38	79	30.9	38	85	40.3	39	81	32.9	48	89	35.1	45	76	16.8	31.2
Rto R Distance	39	77	26.4	47	88	34.6	47	83	26.4	49	76	11.5	49	84	25.7	24.9
Seed bed Preparation	41	79	27.1	36	79	33.4	45	88	36.9	48	83	25.2	52	89	30.6	30.6
Time of Sowing	51	92	36.6	49	86	29.0	38	76	26.0	46	82	25.9	48	85	28.5	29.2
Nursery raising	36	87	45.6	52	89	30.6	52	94	38.7	38	75	24.3	35	80	36.3	35.1
Direct sowing	50	89	32.8	38	91	49.2	48	78	16.5	47	84	28.0	38	73	20.9	29.5
Transplantation of Plants	49	87	30.7	47	84	28.0	46	89	37.3	39	78	28.0	43	86	36.0	32.0
Thinning of Plants	40	86	39.5	53	93	36.0	51	90	33.3	33	74	29.4	39	83	36.0	34.8
Hoeing Practices	41	84	35.2	50	88	31.2	40	83	34.8	45	84	30.4	47	89	36.2	33.6
Watering of Plants	43	93	42.0	43	88	39.1	35	89	49.7	40	85	37.9	36	78	31.8	40.1
Use of Organic matter	33	88	50.5	35	87	46.8	38	84	38.8	31	81	42.7	37	73	22.3	40.2
Identification of Harmful Insects	31	68	22.4	28	71	31.6	32	70	24.3	33	66	16.0	30	68	23.9	23.6
Identification of Beneficial Insects	47	91	39.4	57	96	36.6	51	86	26.7	51	87	28.4	50	88	31.2	32.4
Management of Insect Pests	40	88	42.5	35	74	26.7	48	85	28.5	47	91	39.4	43	84	32.8	34.0
Identification of Diseases	35	76	29.9	39	78	28.0	37	74	24.0	32	69	22.6	48	72	5.3	22.0
Disease Management	38	81	34.1	33	81	40.3	39	79	29.6	37	74	24.0	49	91	37.2	33.0
Identification of Weed	39	83	36.0	47	83	26.4	47	86	31.3	48	83	25.2	38	83	37.2	31.2
Weeds Management	47	89	36.2	48	89	35.1	38	79	30.9	39	85	39.1	35	77	31.5	34.6
Harvesting Time	46	93	43.5	38	88	44.8	45	85	32.1	40	89	44.1	43	83	31.2	39.1
Storage Practices	41	75	20.3	45	93	44.6	50	88	31.2	45	83	28.8	47	89	36.2	32.2



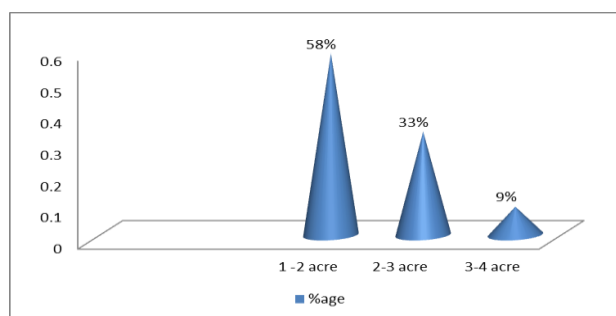
**Figure 1. Age distribution of studied population**



**Figure 3. Marital status of studied population**



**Figure 2. Education level of studied population**



**Figure 4. Land holding of studied population**

**2.7 Statistical analysis**

After the completion of training the post evaluation test was conducted by the external examiner and the results were compared with those of pre evaluation. The data regarding knowledge of participants at start of training and after completion of training about the various parameters studied were entered in a spread sheet. The percent increase in the knowledge of the participants was calculated accordingly.

**3. Results and discussion**

The results showed that majority (61.0%) of the women farmers had their age between 25-40 years followed by 15-24 years (39%) (Fig.1). Agriculture needs energetic bodies to work with as in present study majority was of young people so they were all abled bodied person and were able to do hard job of agriculture.

**Table 2: Effect of training on different assessment parameters in Tehsil Muzaffargarh**

Parameters	Villages			Ghehnaywala			Goddar Chowck			Rodanwala			Diganaywala			Average %age
	Yaruwala	Pre	Po	% increase	Pre	Po	% increase	Pre	Po	% increase	Pre	Po	% increase	Pre	Po	
Knowledge about Kitchen Gardening	50	87	29.5	39	90	46.7	51	82	19.8	33	79	37.2	38	80	32.5	33.1
Rabi vegetables	30	80	42.5	45	87	35.3	54	87	24.9	39	97	56.8	34	87	47.9	41.5
Kharif vegetables	40	86	39.5	52	83	20.3	41	84	35.2	47	89	36.2	49	83	24.0	31.0
Seeds Identification	30	85	49.7	47	76	14.2	33	87	49.1	48	86	30.2	43	89	40.7	36.8
Seed rate for vegetables	48	85	28.5	48	86	30.2	47	79	19.5	38	89	46.3	43	93	46.8	34.3
Plant to Plant distance	34	83	42	39	95	53.9	45	94	46.1	45	87	35.3	41	95	51.8	45.8
Rto R Distance	36	86	44.1	47	81	23	39	82	34.4	51	89	31.7	39	94	52.5	37.2
Seed bed Preparation	40	94	51.4	59	83	11.9	42	88	40.3	39	71	16.1	42	91	44.8	32.9
Time of Sowing	38	79	30.9	53	85	22.6	45	87	35.3	53	87	26.1	44	83	30.0	29.0
Nursery raising	50	88	31.2	42	94	49.3	49	80	18.8	28	85	52.1	37	87	44.5	39.2
Direct sowing	30	86	51.1	35	89	49.7	32	83	44.4	51	91	35.0	52	88	28.9	41.8
Transplantation of Plants	40	83	34.8	37	78	30.6	38	84	38.8	37	85	41.5	36	86	44.1	37.9
Thinning of Plants	40	80	30.0	39	83	36.0	39	87	42.2	38	84	38.8	48	79	18.2	33.0
Hoeing Practices	34	78	34.4	33	87	49.1	33	83	43.2	34	79	36.0	45	81	25.4	37.6
Watering of Plants	30	89	55.3	46	80	22.5	34	93	56.4	41	78	25.4	38	78	29.3	37.8
Use of Organic matter	31	76	35.2	32	91	55.8	30	82	45.4	36	83	39.6	29	83	48.1	44.8
Identification of Harmful Insects	29	71	30.2	36	68	15.1	34	77	32.8	38	73	20.9	34	66	14.5	22.7
Identification of Beneficial Insects	42	84	34.0	38	81	34.1	43	79	24.6	53	95	39.2	37	96	57.5	37.9
Management of Insect Pests	40	77	25.1	47	84	28.0	37	77	28.9	41	83	33.6	48	88	33.5	29.8
Identification of Diseases	46	93	43.5	46	88	35.7	44	79	23.3	49	90	35.6	38	79	30.9	33.8
Disease Management	48	91	38.3	38	83	37.2	45	91	41.5	39	89	45.2	35	87	46.8	41.8
Identification of Weed	54	86	23.2	40	81	31.6	50	78	13.9	46	90	38.9	46	86	32.5	28.0
Weeds Management	58	82	11.3	43	80	26.3	57	81	10.6	41	83	33.6	44	83	30.0	22.3
Harvesting Time	42	80	27.5	38	84	38.8	38	78	29.3	45	88	36.9	38	80	32.5	33.0
Storage Practices	48	84	26.9	51	92	36.6	47	78	17.7	47	88	34.6	52	87	27.2	28.6

**Table 3: Targeted villages with results**

Target Village	Pre Evaluation Result	Post Evaluation Result	Learning %age
Karamdad	41.44	84.44	35.23
Khajiwala	44.24	86.56	35.70
Sheraywala	43.48	84.32	32.80
Basti Poni	42.36	81.84	30.18
Basti Meerwala	43.16	82.32	19.33
Yaruwala	40.32	83.72	35.60
Ghehnaywala	42.80	84.36	33.38
Goddar Chowk	41.88	83.20	32.65
Rodanwala	42.28	85.52	36.11
Dhingrywala	41.20	85.16	36.60
<b>Overall %age</b>	<b>42.31</b>	<b>84.14</b>	<b>32.75</b>

As for education of the trainees was concerned a big portion (67.0%) completed middle level education and about one-quarter (27.0%) had primary education while only 6% had completed their education up to matriculation level (Fig. 2).

Most of the women participants were educated and it is education which plays an important role in acceptance or rejection of a technology. There was a big hope that all the participants will adopt kitchen gardening on permanent basis.

The data regarding marital status of women involved in training showed that the percentage of married women were 67% and the rest 33% were unmarried (Fig.3). As for as land holding is concerned about half (58.0%) possessed small land holding i.e., 1-2 acres of land, 33% possessed 2-3 acres of land while only 9.0% were with land holding of 3-4 acres (Fig. 4).

These finding are in partially agreement with those of Mansoor et al., (2007), Ebiwoei (2013) and of Ekerete and Asa (2014) who reported that age of majority of women in vegetables production was

between 31-40 years, more than fifty per cent of women were married and fifty three percent were with secondary level education.

The participants of the training were greatly benefited from the training as is evident from Table 1, 2 and 3. These trained women will work as a Community Resource Persons in their area and will be helpful to extend their knowledge to the other community women for their better livelihood (Kumbhar, 2015).

Keeping in view all the parameters of the training it was observed that the maximum 40.2% and 40.1% learning was about the benefits of organic matter and watering of plants respectively, while the minimum learning was in identification of the diseases and harmful insects which were 22% and 23.6% respectively as shown in the Table 1 and 2. These findings are in partial accordance with those of Mansoor et al. (2007).

#### 4. Conclusion

The training had a very good impact not only on increase in knowledge regarding kitchen gardening, seasonal and off season vegetable production but also the external and internal factors which influence the vegetable crops like pest insects and diseases but they were now aware of the beneficial insects and capable of growing vegetables organically. They have the ability to get more production by timely sowing with proper seed selection and seed rate and maintaining the plant to plant and row to row distances, in time fertilizers applications followed by irrigation and ultimately the timely harvesting. The training



empowered the village women to make timely decisions regarding their crops management. Some of the trained participants were now contributing in training of other community women which were not the part of training. The training had very good impact on the confidence level of the participants which made them so confident that they were no more restricted and bound to their male members for going out for their necessities. It became evident that women can do a better job of vegetable production if they are provided with proper training, inputs, suitable technological package and confidence. In nutshell all the participants were socially stronger than before as they were more confident, empowered with enhanced decision making and skills.

### Acknowledgements

The authors are highly obliged to Dr. Muhammad Asghar Deputy Director (PP) Adaptive Research Farm, Gujranwala, Pakistan for proof reading of this manuscript.

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