

Original Research Article

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## Understanding Gender Dynamics in Fruit Cultivation under Indian Condition

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### ABSTRACT

#### Keywords

Gender, Farm women, Fruit, Cultivation, Gender gap

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The study aims at identifying the potential role of Indian farmwomen in fruit based production system along with realising their constraints which limits their considerable contribution in terms of technology application, use of agri-inputs and commercial marketing. The magnitude of their participation is hardly visualized, which creates perceptible gender gap. The emerging issues of farmer suicide, rural-urban migration of male members and disenchantment of rural youth in agriculture, overburden the Indian farmwomen with farming activities. Gender analysis will help in formulating suitable strategies for providing better platform to women farmers to realize their untapped potential in bring sustainability to the production system.

### Introduction

Indian women farmers are vital entities for guaranteeing food security not only for their families but also for the community (Oluwatayo, 2012). Their roles vary from region to region and are transforming rapidly in many parts of India, where economic and social forces are revolutionizing the agricultural sector (Sekhar *et al.*, 2013). The roles and status of women in agriculture and rural areas vary widely with region, age, literacy rates, ethnicity and social class

(Fartyal and Rathore, 2013). They play a substantial role in production system, encompassing cultivation, crop management, harvesting, maintenance, sorting, grading, packaging and selling.

They form a magnitude of work force in agriculture encompassing 79 per cent as against only 63 per cent of men (NSSO, 2010). In rural areas the percentage of women work force is even higher, 84 per cent (Lal and Khurana, 2011). Majority of farm women are overburdened, face enormous drudgery and occupational health hazards in their workplace

and are economically, nutritionally under secured. They have poor exposure to advanced agricultural technologies, Govt. schemes and policies and even lack the essential prerequisites to avail the subsidy facilities in agriculture due to lack of ownership of land.

They often face harassment in terms of lower wage rate, poor working facilities and are often ignored and overlooked due to the nature of work they perform which is often regarded as non-skilful, monotonous and time consuming. In order to sustain these vulnerable communities, there is a need to quantify and showcase their potential and irreplaceable role. As well as identify the constraints, which the society has created for them, so that suitable strategies can be thought of in order to bring them to a platform where they have independency to execute and realize their untapped potential in bringing sustainability to the production system. Fruit cultivation is highly remunerative and can ensure stabilization of women's empowerment by providing employment opportunities through commercial cultivation, post-harvest management & processing, nursery production, agri-horti tourism etc. Therefore, an attempt has been made in this study to assess women's latent role, gender gaps and constraints in fruit based production system.

## **Materials and Methods**

The investigation was carried out during 2016 in Kuchinda block of Sambalpur district of Odisha, India, by interviewing 138 farmwomen selected by stratified random sampling. Nine villages having potential fruit growing areas were selected for the purpose of study. The responses of 138 farmwomen on various aspects of fruit cultivation were collected through semi-structured interview schedule. The various activities associated with fruit cultivation is listed in Table 2.

The farm women engaged in fruit cultivation

were asked to assess their participation in each of these activities and score was allotted accordingly based on following parameters.

Crop wise frequency of respondents in 1-4 categories in each activity (1-32) was worked out and percentage of participation was calculated. Objective quantification of participation of woman in each parameter was done by defining clearly the full, moderate, low and nominal participation allotting weighed scores and calculating the participation quotient. Participation quotient was calculated by using a 0-3 scale of weighted score. Category of nominal participation was allotted 0, low participation 1, moderate participation 2 and full participation 3 weighted score. The participation quotient was calculated by using following formula.

$$\text{Mean score of participation} \\ \text{Participation quotient} = \frac{\text{-----}}{\text{Maximum obtainable score of participation}} \times 100$$

The participation quotients were further used for working out mean, standard deviation, variance, co-efficient of variation and standard error mean. Based on participation quotient, the extent of participation was worked out activity-wise and crop-wise into four categories based on following scale.

## **Results and Discussion**

The farm women's participation in various activities of fruit crops was surveyed on the basis of comparative participation scale (1-4) consisting of four categories as nil, low, moderate and full. Their category wise percentage participation in different crops and activities has been presented in Table 1. Activity wise over all participation quotients, Crop wise participation quotients and Crop wise over all participation quotients of farm women in various activities of fruit cultivation

have been presented in Table 2, 3 and 4 respectively. Based on the findings of the survey (as per Table 1, 2, 3 and 4), women's role/participation in various aspects of fruit cultivation has been discussed under following heads:

### **Field preparation and use of various farm machineries**

Farm women had moderate participation in land preparation and layout of fruit crops like mango (54.60 c), banana (62.96 c), papaya (55.56 c) and litchi (35.56 c). The participation in use of machineries for spraying operation was nominal (29.00 a), while in case of other farm machineries and tools it was low (36.93 b). Mango, banana and litchi were commercial fruit crops of the region. Due to abundance in availability and lower wage rate, the magnitude of women labourers was more in the orchard. As a result, such drudgery prone activities in the orchards were equally shared by both men and women. Use of power operated machineries were solely conducted by male counterparts as only men received training and thus acquired the skill in operation of power operated machineries such as tractor, tree pruner, power tiller and power sprayer. Such activities were exclusively done by men due to two main reasons firstly the stereotype nature of the society that considered such activities to be male centric, including the manufacturers and distributors, who designed and promoted the models which were not gender neutral. Even the spraying operations were mostly carried out by men as most of the women labourers accompanied their infants and children in farm activities and were apprehensive about the occupational health hazards encountered during spraying of agro-chemicals. As a point of intervention, it is suggested that gender neutral machineries should be designed and promoted in a country like India where the abundance of female workers is quite acute.

Empowerment of women farmers in use of machineries that are low cost, mostly solar operated and easy to maintain can bring revolution in Indian agriculture. Moreover the subsidy pattern of Govt. in availing these machineries makes it unfeasible for women farmers in accessing such machineries. However with suitable policy interventions such inputs can be extended to women groups. Suitable arrangements of shelter places for the infants and provision of drinking water, food will encourage and motivate the women farmers in their work place.

### **Production aspects**

The farm women had full participation in post planting care (63.78 d), mulching (60.39 d) and harvesting (77.07 d). While, the participation was moderate in planting of fruit crops (56.38 c), application of organic manures (49.67 c), water management (44.06 c) and weed management (47.66 c). There was full participation in planting of mango (65.52 d) and banana (81.48 d) due to increase in cropping area of these crops under different Govt. schemes. It was observed that both men and women had equal role to play in production aspects of fruit crops. However, the nature of the society, orthodox mindset of people and gender blindness compel us to overlook the unique role of women farmers. Farm women are often regarded as labourers and not as growers.

### **Knowledge and participation on improved technologies of fruit crops**

Farm women had nominal to low knowledge regarding improved technologies of fruit crops. In activities like high density planting (28.25 a), training, pruning (29.71 a) and modern ripening techniques (23.53 a), they had nominal knowledge. While, in activities like nursery raising techniques (33.61 b), drip irrigation (33.21 b), fertilizer application,

nutrient scheduling (39.53 b), knowledge of major pest, diseases (35.11 b) and integrated pest and disease management (40.08 b), they had low level of knowledge and participation. They possessed moderate knowledge regarding critical stages of irrigation (51.28 c) and full knowledge on fruit maturity (61.01 d). The farm women had full participation in planting material production of mango (60.92 d), moderate participation in high density planting (HDP) in mango (52.87 c) and banana (74.07 c). It was observed that women of the region had poor technical competency. However with government interventions in the form of schemes and policies, women farmers had certain level of knowledge in improved production technologies of commercially viable fruit crops like mango and banana. Limited knowledge and participation of farm women in improved technologies of fruit crops can be attributed to the fact that there existed huge gender gap due to differential level of exposure of men and women to various training, skill up gradation and capacity building programmes. Similar findings were also obtained by Sethi and Sharma 2011, as they reported that the involvement of women in production-oriented

trainings and other extension programmes should be not only as beneficiaries but also as change agents for higher adoption and diffusion of latest farm technologies.

**Post-production aspects**

Farm women had moderate participation in sorting & grading of fruits (51.22 c), low participation in value addition, preservation and processing of fruits (37.00 b) and nominal participation in marketing of processed products (25.43 a). The participation of women in marketing of fresh fruits was better in papaya (86.12 d), guava (83.34 d), lemon (83.34 d) and minor fruits (72.73 d) as these fruits were mostly sold in local markets. However, in commercially important fruit crops like mango (55.17 c), banana (61.12 b) and litchi (33.34 c), the male members dominated over marketing of fruits to distant markets, as these fruits fetched better prices and were harvested in bulk. Due to lack of proper post-harvest infrastructure facilities, the processing of fruit crops and the marketing of processed products was low and nominal respectively.

**Level of participation**

Sl. no.	Level of participation	Parameter
1	Full participation	Women participation is more than men
2	Moderate participation	Equal participation by both men and women
3	Low participation	Involvement of women is less
4	No participation	Poor participation by women

**The extent of participation was worked out activity-wise and crop-wise into four categories**

Sl. No.	Category	Symbol	Calculated values
1	No participation	(a)	< (General Mean-1SD)
2	Low participation	(b)	< General Mean and > (General Mean-1SD)
3	Moderate participation	(c)	<(General Mean+1SD) and > General Mean
4	Full participation	(d)	< (General Mean+2SD) and > (General Mean+1SD)

**Table.1** Crop wise per cent participation of farm women in different activities of fruit cultivation

Crop	Category	Category score	Crop wise per cent participation of farm women in different activities of fruit cultivation (Activity 1-16)																
			Activity 1	Activity 2	Activity 3	Activity 4	Activity 5	Activity 6	Activity 7	Activity 8	Activity 9	Activity 10	Activity 11	Activity 12	Activity 13	Activity 14	Activity 15	Activity 16	
Mango	1	0	5.17	6.89	22.41	12.07	3.44	6.89	3.44	5.17	8.62	20.68	12.06	25.86	3.44	13.79	3.44	12.06	
	2	1	17.24	32.75	29.31	24.14	37.93	36.20	31.03	15.51	46.55	36.20	44.82	41.37	46.55	36.20	44.82	41.37	41.38
	3	2	55.17	20.68	31.03	32.76	50.00	51.72	31.03	55.17	22.41	17.24	17.24	32.76	41.38	24.14	43.10	22.41	22.41
	4	3	22.41	39.65	17.24	31.03	8.62	5.17	34.48	24.13	22.41	25.86	25.86	0	8.62	25.86	8.62	24.14	24.14
Banana	1	0	11.12	0	16.67	16.67	0	0	5.56	0	5.56	16.67	16.67	33.34	0	22.23	0	11.12	11.12
	2	1	5.56	22.23	11.12	5.56	16.67	22.23	5.56	22.23	27.78	11.12	11.12	5.56	22.23	0	22.23	11.12	11.12
	3	2	72.23	11.12	66.67	11.12	77.78	72.23	27.78	61.12	5.56	11.12	11.12	61.12	72.23	16.67	72.23	16.67	16.67
	4	3	11.12	66.67	5.56	66.67	5.56	5.56	61.12	16.67	61.12	61.12	61.12	0	5.56	61.12	5.56	61.12	61.12
Litchi	1	0	20.00	26.67	46.67	53.34	13.34	13.34	6.67	13.34	33.34	20.00	53.34	40.00	13.34	26.67	13.34	0	0
	2	1	53.34	46.67	40.00	20.00	66.67	73.34	73.34	20.00	66.67	60.00	13.34	40.00	40.00	33.34	46.67	53.34	53.34
	3	2	26.67	26.67	13.34	26.67	20.00	13.34	20.00	60.00	0	20.00	33.34	13.34	33.34	40.00	33.34	40.00	40.00
	4	3	0	0	0	0	0	0	0	6.67	0	0	0	6.67	13.34	0	6.67	6.67	6.67
Papaya	1	0	0	16.67	0	100.00	0	8.34	0	0	50.00	50.00	0	33.34	0	0	0	0	0
	2	1	33.34	50.00	50.00	0	41.67	41.67	25.00	0	50.00	50.00	66.67	66.67	41.67	75.00	16.67	41.67	41.67
	3	2	33.34	25.00	50.00	0	50.00	33.34	58.34	33.34	0	0	33.34	0	41.67	25.00	83.34	50.00	50.00
	4	3	33.34	8.34	0	0	8.34	16.67	16.67	16.67	66.67	0	0	0	16.67	0	0	8.34	8.34
Guava	1	0	0	30.00	30.00	0	0	0	0	0	40.00	30.00	20.00	10.00	20.00	20.00	40.00	0	0
	2	1	40.00	40.00	60.00	30.00	80.00	40.00	60.00	10.00	60.00	60.00	50.00	50.00	20.00	60.00	60.00	40.00	40.00
	3	2	20.00	30.00	10.00	70.00	20.00	60.00	40.00	60.00	0	10.00	30.00	40.00	60.00	20.00	0	60.00	60.00
	4	3	40.00	0	0	0	0	0	0	0	30.00	0	0	0	0	0	0	0	0
Lemon	1	0	21.43	14.29	28.57	57.14	21.43	42.86	7.14	21.43	64.29	14.29	50.00	21.43	0	28.57	7.14	0	0
	2	1	28.57	64.29	71.43	42.86	71.43	50.00	78.57	57.14	35.71	64.29	42.86	78.57	57.14	57.14	50.00	71.43	71.43
	3	2	42.86	21.43	0	0	7.14	7.14	14.29	21.43	0	21.43	7.14	0	42.86	14.29	42.86	28.57	28.57
	4	3	7.14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minor fruits	1	0	18.18	63.64	54.55	90.91	90.91	27.27	0	0	100.00	63.64	54.55	72.73	0	72.73	27.27	18.18	18.18
	2	1	45.45	36.36	45.45	9.09	9.09	72.73	9.09	0	0	36.36	45.45	27.27	100.00	27.27	72.73	81.82	81.82
	3	2	27.27	0	0	0	0	0	90.91	100.00	0	0	0	0	0	0	0	0	0
	4	3	9.09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Crop wise per cent participation of farm women in different activities of fruit cultivation (Activity 17-32) cont...

Crop	Category	Category score	Activity 17	Activity 18	Activity 19	Activity 20	Activity 21	Activity 22	Activity 23	Activity 24	Activity 25	Activity 26	Activity 27	Activity 28	Activity 29	Activity 30	Activity 31	Activity 32
Mango	1	0	32.75	24.14	13.79	13.79	41.38	34.48	31.03	0	15.51	29.31	6.89	12.07	12.07	17.24	22.41	31.03
	2	1	29.31	34.48	48.28	27.59	15.51	31.03	27.59	37.93	34.48	25.86	43.10	25.86	39.66	29.31	32.76	24.14
	3	2	13.79	17.24	12.06	31.03	17.24	24.14	34.48	31.03	43.10	17.24	44.82	46.55	20.69	27.59	18.97	17.24
	4	3	24.14	24.14	25.86	27.59	25.86	10.34	6.90	31.03	6.89	27.58	5.17	15.52	27.59	25.86	25.86	27.59
Banana	1	0	22.23	22.23	22.23	16.67	22.23	11.12	16.67	0	11.12	22.23	5.56	11.12	11.12	100	100	22.23
	2	1	5.56	5.56	5.56	11.12	27.78	16.67	16.67	16.67	16.67	11.12	27.78	5.56	11.12	0	0	5.56
	3	2	5.56	5.56	16.67	11.12	27.78	61.12	66.67	16.67	72.23	27.78	61.12	72.23	16.67	0	0	5.56
	4	3	66.67	66.67	55.56	61.12	22.23	11.12	0	66.67	0	38.89	5.56	11.12	61.12	0	0	66.67
Litchi	1	0	73.34	0	26.67	33.34	46.67	40.00	66.67	6.67	0	60.00	13.34	46.67	46.67	33.34	100.00	6.67
	2	1	13.34	33.34	60.00	33.34	33.34	60.00	13.34	33.34	66.67	40.00	40.00	6.67	20.00	66.67	0	66.67
	3	2	13.34	60.00	6.67	26.67	20.00	0	20.00	53.34	33.34	0	46.67	46.67	33.34	0	0	20.00
	4	3	0	6.67	6.67	6.67	0	0	0	6.67	0	0	0	0	0	0	0	6.67
Papaya	1	0	0	0	16.67	25.00	33.34	16.67	0	0	0	50.00	0	0	0	0	0	8.34
	2	1	66.67	16.67	58.34	50.00	58.34	41.67	0	0	0	50.00	25.00	0	58.34	41.67	25.00	50.00
	3	2	33.34	58.34	25.00	25.00	8.34	41.67	66.67	16.67	41.67	0	50.00	41.67	33.34	58.34	58.34	41.67
	4	3	0	25.00	0	0	0	0	33.34	83.34	58.34	0	25.00	58.34	8.34	0	16.67	0
Guava	1	0	10.00	0	50.00	30.00	30.00	10.00	0	0	0	80.00	0	0	0	20.00	30.00	40.00
	2	1	70.00	50.00	40.00	50.00	70.00	70.00	40.00	0	0	20.00	20.00	0	80.00	50.00	70.00	50.00
	3	2	20.00	50.00	10.00	20.00	0	20.00	60.00	20.00	70.00	0	80.00	50.00	20.00	30.00	0	10.00
	4	3	0	0	0	0	0	0	0	80.00	30.00	0	0	50.00	0	0	0	0
Lemon	1	0	50.00	0	21.43	0	28.57	14.29	14.29	0	0	78.57	0	0	0	0	21.43	35.71
	2	1	50.00	35.71	64.29	71.43	57.14	64.29	57.14	0	42.86	21.43	28.57	7.14	28.57	21.43	78.57	57.14
	3	2	0	50.00	14.29	28.57	14.29	21.43	28.57	57.14	57.14	0	50.00	35.71	71.43	50.00	0	7.14
	4	3	0	14.29	0	0	0	0	0	42.86	0	0	21.43	57.14	0	28.57	0	0
Minor fruits	1	0	81.82	0	72.73	72.73	72.73	9.09	0	0	0	63.64	45.45	0	9.09	63.64	63.64	45.45
	2	1	18.18	0	27.27	27.27	27.27	90.91	27.27	27.27	0	36.36	54.55	9.09	54.55	18.18	27.27	54.55
	3	2	0	100.00	0	0	0	0	72.73	36.36	100.00	0	0	63.64	36.36	0	9.09	0
	4	3	0	0	0	0	0	0	0	36.36	0	0	0	27.27	0	18.18	0	0

**Table.2** Activity wise over all participation quotients of farm women in fruit cultivation

Code	Aspect	Mean Participation quotient
Activity-1	Decision in selecting the type of crops to be grown	54.65 c
Activity-2	Involvement in selection of fruit crops and their varieties	43.14 b
Activity-3	Access to quality planting material	34.18 b
Activity-4	Involvement in nursery raising	33.61 b
Activity-5	Involvement in land preparation and layout	40.04 b
Activity-6	Involvement in pit digging and filling	42.56 b
Activity-7	Involvement in planting	56.38 c
Activity-8	Involvement in post planting care	63.78 d
Activity-9	Knowledge and skill on High Density Planting	28.25 a
Activity-10	Selection of intercrops	35.16 b
Activity-11	Involvement in purchase of agricultural inputs (planting materials, fertilizers, insecticides and pesticides etc.)	38.07 b
Activity-12	Knowledge and participation in canopy management of fruit crops	29.71 a
Activity-13	Knowledge and participation in application of organic manure	49.67 c
Activity-14	Knowledge and participation in application of inorganic fertilizers	39.53 b
Activity-15	Knowledge and participation in water management	44.06 c
Activity-16	Knowledge on critical stages of irrigation	51.28 c
Activity-17	Knowledge on drip irrigation	33.21 b
Activity-18	Mulching	60.39 d
Activity-19	Knowledge of important pest and diseases	35.11 b
Activity-20	Knowledge and practice of integrated pest and disease management	40.08 b
Activity-21	Use of machineries for spraying operation	29.00 a
Activity-22	Use of other farm machineries and tools	36.93 b
Activity-23	Weed Management	47.66 c
Activity-24	Involvement in harvesting of matured fruits	77.07 d
Activity-25	Knowledge on fruit maturity	61.01 d
Activity-26	Knowledge and skills in modern ripening technique	23.53 a
Activity-27	Sorting and grading of fruits	51.22 c
Activity-28	Involvement in marketing	67.87 d
Activity-29	Decision in case of surplus yield and glut in market	49.85 c
Activity-30	Value addition, preservation and processing of fresh fruits	37.00 b
Activity-31	Marketing of processed products	25.43 a
Activity-32	Access to training, skill up gradation and capacity building programs	38.76 b
	<b>Mean</b>	<b>43.69</b>
	<b>SD</b>	<b>12.74</b>
	<b>Variance</b>	<b>162.31</b>
	<b>CV</b>	<b>0.29</b>
	<b>SEm</b>	<b>1.08</b>

**Table.3** Crop wise participation quotients of farm women in various activities of fruit cultivation

	Fruit crop wise participation quotient in each activity*								
	Mango	Banana	Litchi	Papaya	Guava	Lemon	Minor fruits	Mean	SD
Activity 1	64.95 d	61.11 b	35.56 c	66.67 c	66.67 d	45.24 c	42.42 c	54.65	12.18
Activity 2	64.37 d	81.48 d	33.34 c	41.67 b	33.34 b	35.71 b	12.12 b	43.14	21.15
Activity 3	47.70 b	53.70 b	22.23 b	50.00 b	26.67 b	23.81 b	15.15 b	34.18	14.56
Activity 4	60.92 d	75.93 c	24.45 b	0 a	56.67 c	14.29 a	3.03 a	33.61	28.26
Activity 5	54.60 c	62.96 c	35.56 c	55.56 c	40.00 b	28.57 b	3.03 a	40.04	18.90
Activity 6	51.72 b	61.11 b	33.34 c	52.78 c	53.34 c	21.43 b	24.24 b	42.56	14.72
Activity 7	65.52 d	81.48 d	37.78 c	63.89 c	46.67 c	35.71 b	63.64 d	56.38	15.54
Activity 8	66.09 d	64.81 c	53.34 d	88.89 d	73.34 d	33.34 b	66.67 d	63.78	15.91
Activity 9	52.87 c	74.07 c	22.23 b	16.67 a	20.00 a	11.91 a	0 a	28.25	23.93
Activity 10	49.43 b	72.23 c	33.34 c	16.67 a	26.67 b	35.71 b	12.12 b	35.16	19.00
Activity 11	52.30 c	72.23 c	26.67 b	44.45 b	36.67 b	19.05 a	15.15 b	38.07	18.63
Activity 12	35.63 a	42.59 a	28.89 b	22.23 a	43.34 c	26.19 b	9.09 b	29.71	11.22
Activity 13	51.72 b	61.12 b	48.89 d	58.34 c	46.67 c	47.62 c	33.34 c	49.67	8.37
Activity 14	54.02 c	72.23 c	37.78 c	41.67 b	33.34 b	28.57 b	9.09 b	39.53	18.40
Activity 15	52.30 c	61.12 b	44.45 c	61.12 c	20.00 a	45.24 c	24.24 b	44.06	15.22
Activity 16	52.87 c	75.93 c	51.12 d	55.56 c	53.34 c	42.86 c	27.27 b	51.28	13.52
Activity 17	43.10 a	72.23 c	13.34 a	44.45 b	36.67 b	16.67 a	6.06 b	33.21	21.26
Activity 18	47.13 b	72.23 c	57.78 d	69.45 c	50.00 c	59.53 d	66.67 d	60.39	8.89
Activity 19	50.00 b	68.52 c	31.12 b	36.12 b	20.00 a	30.95 b	9.09 b	35.11	18.04
Activity 20	57.47 c	72.23 c	35.56 c	33.34 b	30.00 b	42.86 c	9.09 b	40.08	18.79
Activity 21	42.53 a	50.00 b	24.45 b	25.00 a	23.34 b	28.57 b	9.09 b	29.00	12.48
Activity 22	36.78 a	57.40 b	20.00 b	41.67 b	36.67 b	35.71 b	30.30 c	36.93	10.51
Activity 23	39.08 a	50.00 b	17.78 a	77.78 d	53.34 c	38.10 c	57.58 d	47.66	17.33
Activity 24	64.37 d	83.34 d	53.34 d	94.45 d	93.34 d	80.95 d	69.70 d	77.07	14.14
Activity 25	47.13 b	53.70 b	44.45 c	86.12 d	76.67 d	52.38 c	66.67 d	61.01	14.65
Activity 26	47.70 b	61.12 b	13.34 a	16.67 a	6.67 a	7.14 a	12.12 b	23.53	20.11
Activity 27	49.43 b	55.56 b	44.45 c	66.67 c	60.00 c	64.28 d	18.18 b	51.22	15.33
Activity 28	55.17 c	61.12 b	33.34 c	86.12 d	83.34 d	83.34 d	72.73 d	67.87	17.87
Activity 29	54.60 c	75.93 c	28.89 b	50.00 b	40.00 b	57.14 d	42.42 c	49.85	13.87
Activity 30	54.02 c	0 a	22.23 b	52.78 c	36.67 b	69.05 d	24.24 b	37.00	21.77
Activity 31	49.43 b	0 a	0 a	63.89 c	23.34 b	26.19 b	15.15 b	25.43	22.23
Activity 32	47.13 b	72.23 c	42.23 c	44.45 b	23.34 b	23.81 b	18.18 b	38.76	17.40
Mean	51.94	61.86	32.85	50.78	42.81	37.87	27.75	<b>43.69</b>	
SD	7.83	18.78	12.99	22.67	19.98	18.68	22.78		

\*a-nominal participation, b-low participation, c-moderate participation, d-full participation



**Table.4** Crop wise over all participation quotients of farm women in fruit cultivation

Crop	Mean Participation quotient
Mango	51.94 <b>c</b>
Banana	61.86 <b>d</b>
Litchi	32.85 <b>b</b>
Papaya	50.78 <b>c</b>
Guava	42.81 <b>b</b>
Lemon	37.87 <b>b</b>
Minor fruits	27.75 <b>a</b>
Mean	<b>43.69</b>
SD	<b>11.05</b>
Variance	<b>122.10</b>
CV	<b>0.25</b>
SEm	<b>0.94</b>

\*a-nominal participation, b-low participation, c-moderate participation, d-full participation

The involvement of farm women in post-harvest management of fruit crops was poor on account of small and marginal farm holdings, lack of training on post-harvest handling, inconsistent post-harvest management practices and poor infrastructure, including cold storage facilities.

### **Access to resources**

The access of farm women to several resources refer to the ease in obtaining various inputs required for cultivation of fruit crops viz., land and other agro inputs such as planting materials, farm tools and implements, organic manures, inorganic fertilizers, pesticides and growth regulators etc. The various training and capacity building programmes held at village/block/district level was also considered as a source of technical resource. The availability of quality planting material was low in case of all fruit crops. However, the participation of farm women in purchase of agricultural inputs were moderate in case of mango (52.30 c) and banana (72.23 c), as these were commercially important fruit crops of the region.

Based on the studies conducted, it was found that the farm women had low access to all kinds of resources due to patriarchal nature of the society in which most of the landed properties are inherited by male members and women have poor ownership of land and non-farm assets. Similar findings have been reported by IBRD 2009, who stated that asymmetries in ownership of, access to and control of livelihoods assets (such as land, water, energy, credit, knowledge, and labour) negatively affect woman's food production ability. Differential wage rates of men and women, was another factor which reduced the purchasing ability of women farmers. The time factor is another influential component that hinders women farmers to have access over resources. They are usually overburdened with household chores and care of their children along with addressing the requirements of their male counterparts both at home and at farm. As a result they hardly get time to start their own venture. Poor mobility

and accessibility of rural Indian women to various financial, governmental and non-governmental institutions for financial and non-financial services on account of over-burdened household work and existing social structure also widens the gender gap pertaining to their access to resources and deprives them in identifying and assessing their needs for agricultural inputs. FAO 2009 reported that rural women have poor access to resources needed for socio-economic development such as credit, extension, critical inputs, seeds and planting material supply services

### **Decision making ability**

The decision making ability of farm women with respect to certain issues were also assessed during the study. The criteria of including such aspect in the study were to assess the degree of empowerment of farm women of the region. It was found that the overall participation of farm women in selecting crop/crops of their own choice was moderate (54.65 c). There was overall low participation (43.14 b) in selecting the kind of fruit crops and the varieties to be grown. In situation of surplus yield and glut in the market, the farm women had an overall moderate participation (49.85 c). The results of the study are in confirmation with the findings of Sekar *et al.*, (2014), who reported that women seldom enjoy property ownership rights directly in their names and have little control over decision making in sale of produce, choice of crops, crop production and post-harvest management practices. As a result, men tend to dominate decision-making in both farming and marketing activities.

Considering the crop-wise overall participation of farm women in various activities of fruit cultivation, it can be concluded that the farm women had full participation in cultivation of banana (61.86 d) and moderate participation in mango (51.94 c) and papaya (50.78 c).

The participation was low in fruit crops like litchi (32.85), guava (42.81 b), lemon (37.87 b) and nominal in case of minor fruits (27.75 a).

From the studies, it was observed that women found Banana as a suitable crop, based on its economy and compact dwarf canopy. While, management of fruit crops like mango and litchi were difficult for farm women on account of huge canopy structure.

Crops like guava, lemon and sapota were grown sparsely in homestead garden, while the minor fruits like jackfruit, custard apple, sapota and jamun were cultivated at very low scale and mostly found neglected.

Farm women are actively involved in many production and post-production activities, which significantly contribute to fruit production. However, due to "Gender issues" and "invisibility" of women's roles, their contribution in this field is not properly acknowledged, which results in wide gender gaps.

The United Nations have identified women and girls empowerment and gender equality as one of their Sustainable Development Goals which highlights the fact that gender equality is imperative for achieving higher, inclusive and sustainable development. Therefore, reducing the gender gaps in fruit cultivation by addressing women's issues and problems will play a significant role in achieving sustainability, prosperity in fruit production along with women's empowerment and livelihood improvement of rural households.

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