

PARTICIPATION OF TRIBAL FARMERS IN VEGETABLE CULTIVATION

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Tribal women are mainly concerned with kitchen gardening where they grow all types of vegetables in the form of mixed cropping. Women's participation in vegetable growing goes upto 98 percent. Males are generally engaged in crop cultivation, arrangement of inputs from the market etc. Keeping in view the vital role of women in vegetable cultivation in Meghalaya and Arunachal Pradesh, this study was conducted in the two states with the following objectives:

- (1) To study the participation of tribal male and female farmers
- (2) To study the domination of male and female farmers in vegetable cultivation activities.
- (3) To analyse the time utilization pattern of male and female farmers in vegetable cultivation.

Methodology

This study was conducted in the North Eastern Hill Region of India. Meghalaya and Arunachal Pradesh were selected purposively for this study. One district in each state, one block from each district and two villages from each block were randomly selected in the above-mentioned states. The list of vegetable growers (farmers) was prepared with the help of the Headman and then the farmers were randomly selected. Data were collected from 80 farmers from Meghalaya and 80 farmers from Arunachal Pradesh including their counter parts, with a pre- structured schedule developed in consultation with different experts. Thus 160 male and female farmers were interviewed through direct interview method. The data so collected were tabulated and analysed for a logical conclusion.

Results and Discussion

The data pertaining to male responses of Meghalaya presented in Table-1 indicate that the participation of male farmers was high in land preparation (65.00%), application of FYM (70.00%), direct sowing (100.00%), irrigation (75.00%), fertilizer application (72.50%), plant protection (95.00%), watch and ward (65.00%), digging of ginger (70.00%), marketing of produce (80.00%). The female farmers were engaged mainly in preparation of nursery (45.00%), transplanting (40.00%), intercultural practices

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(45.00%), cleaning of produce(65.00%) and sale of produce(65.00%). These findings were on the lines of the study by Jegathambai. R. (2002).

The participation of male farmers in Arunachal Pradesh in Table-2 revealed that the land preparation and plant protection were the main activities performed by the males. Further result indicated that the participation of female farmers was high in vegetable cultivation. The major activities performed by the female farmers were land preparation (42.50%), application of FYM (65.00%), direct sowing (60.00%), transplanting (55.00%), intercultural operations (67.50%),picking(50.00%),cleaning of produce (70.00%),taking produce to the market (45.00%) and sale of produce (80.00%). .Participation of male farmers ranges from 0.00 to 52.50 percent with the maximum participation in plant protection and minimum in picking ,cleaning and selling of produce. The participation of female farmers ranged from 5.00 to 80.00 per cent with the maximum participation in sale of produce and minimum participation in plant protection. These findings are supported by Balakrishna and Santosh (2002).

Table-1 : Participation of respondents in vegetable cultivation

MEGHALAYA

Sl. No.	Activities	Male response (N=40)				Female response (N=40)			
		M	F	MF	AO	M	F	MF	AO
1.	Land Preparation	26 (65.00)	0 (0.00)	14 (35.00)	0 (0.00)	24 (60.00)	0 (0.00)	16 (40.00)	0 (0.00)
2.	Application of FYM	28 (70.00)	0 (0.00)	10 (25.00)	2 (5.00)	27 (67.50)	0 (0.00)	11 (27.50)	2 (5.00)
3.	Preparation of nursery	12 (30.00)	18 (45.00)	10 (25.00)	0 (0.00)	11 (27.50)	19 (47.50)	10 (25.00)	0 (0.00)
4.	Direct sowing	40 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	40 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)
5.	Transplanting	10 (25.00)	16 (40.00)	8 (20.00)	6 (15.00)	6 (15.00)	18 (45.00)	9 (22.50)	7 (17.50)
6.	Irrigation	30 (75.00)	0 (0.00)	10 (25.00)	0 (0.00)	26 (65.00)	0 (0.00)	14 (35.00)	0 (0.00)
7.	Intercultural operations	15 (37.50)	18 (45.00)	7 (17.50)	0 (0.00)	10 (25.00)	22 (55.00)	8 (20.00)	0 (0.00)
8.	Fertilizer application	29 (72.50)	0 (0.00)	11 (27.50)	0 (0.00)	28 (70.00)	0 (0.00)	12 (30.00)	0 (0.00)



9. Plant protection	38 (95.00)	0 (0.00)	0 (0.00)	2 (5.00)	36 (90.00)	0 (0.00)	0 (0.00)	4 (10.00)
10. Watch and ward	26 (65.00)	8 (20.00)	0 (0.00)	6 (15.00)	24 (60.00)	9 (22.50)	0 (0.00)	7 (17.50)
11. Picking	13 (42.50)	15 (37.50)	8 (20.00)	4 (10.00)	12 (30.00)	16 (40.00)	5 (12.50)	7 (17.50)
12. Digging	28 (70.00)	0 (0.00)	12 (30.00)	0 (0.00)	30 (75.00)	0 (0.00)	10 (25.00)	0 (0.00)
13. Cleaning of produce	8 (20.00)	26 (65.00)	4 (10.00)	2 (5.00)	7 (17.50)	28 (70.00)	2 (5.00)	3 (7.50)
14. Taking produce to market	32 (80.00)	0 (0.00)	8 (20.00)	0 (0.00)	30 (75.00)	0 (0.00)	10 (25.00)	0 (0.00)
15. Sale of produce	14 (35.00)	26 (65.00)	0 (0.00)	0 (0.00)	16 (40.00)	24 (60.00)	0 (0.00)	0 (0.00)

$r = 0.953^{**}$

$r = 0.848^{**}$

ARUNACHAL PRADESH

Sl. No.	Activities	Male response (N=40)				Female response (N=40)			
		M	F	MF	AO	M	F	MF	AO
1. Land Preparation		16 (40.00)	17 (42.50)	7 (17.50)	0 (0.00)	16 (40.00)	17 (42.50)	7 (17.50)	0 (0.00)
2. Application of FYM		2 (5.00)	26 (65.00)	9 (22.50)	3 (7.50)	27 (67.50)	10 (25.00)	3 (7.50)	0 (0.00)
3. Preparation of nursery		7 (17.50)	10 (25.00)	22 (55.00)	1 (2.50)	7 (17.50)	12 (30.00)	20 (50.00)	1 (2.50)
4. Direct sowing		8 (20.00)	24 (60.00)	8 (20.00)	0 (0.00)	6 (15.00)	24 (60.00)	10 (25.00)	0 (0.00)
5. Transplanting		6 (20.00)	22 (60.00)	10 (20.00)	2 (0.00)	6 (15.00)	23 (60.00)	9 (25.00)	2 (0.00)
6. Irrigation		12 (30.00)	13 (32.50)	11 (27.50)	4 (10.00)	10 (25.00)	14 (35.00)	12 (30.00)	4 (10.00)
7. Intercultural operations		27 (12.50)	7 (67.50)	1 (17.50)	3 (2.50)	30 (7.50)	7 (75.00)	1 (17.50)	5 (2.50)
8. Plant protection		21 (52.50)	2 (5.00)	5 (12.50)	0 (0.00)	20 (50.00)	3 (7.50)	5 (12.50)	0 (0.00)

9. Watch and ward	2 (5.00)	18 (45.00)	10 (25.00)	10 (25.00)	1 (2.50)	20 (50.00)	4 (10.00)	15 (37.50)
10. Picking (tomato, chilli etc.)	0 (0.00)	20 (50.00)	14 (35.00)	6 (15.00)	0 (0.00)	22 (55.00)	12 (30.00)	6 (15.00)
11. Digging	12 (30.00)	17 (42.50)	8 (20.00)	2 (5.00)	12 (30.00)	17 (42.50)	7 (17.50)	3 (7.50)
12. Cleaning of produce	28 (0.00)	7 (70.00)	5 (17.50)	0 (12.50)	28 (0.00)	7 (70.00)	5 (17.50)	0 (12.50)
13. Taking produce to market	4 (10.00)	18 (45.00)	7 (17.50)	5 (12.50)	4 (10.00)	20 (50.00)	12 (30.00)	4 (10.00)
14. Sale of produce	0 (0.00)	32 (80.00)	8 (20.00)	0 (0.00)	0 (0.00)	35 (87.50)	5 (12.50)	0 (0.00)

 $r = 0.965 **$ $r = 0.992 **$ **POOLED**

Sl. No.	Activities	Male response (N=80)				Female response (N=80)			
		M	F	MF	AO	M	F	MF	AO
1.	Land Preparation	46 (57.50)	16 (20.00)	22 (27.50)	0 (0.00)	4 (50.00)	16 (20.00)	24 (30.00)	0 (0.00)
2.	Application of FYM	30 (37.50)	26 (32.50)	19 (23.75)	5 (6.25)	27 (33.75)	27 (33.75)	21 (26.25)	5 (6.25)
3.	Preparation of nursery	19 (23.75)	28 (35.00)	32 (40.00)	1 (1.25)	18 (22.50)	31 (38.75)	30 (37.50)	1 (1.25)
4.	Direct sowing	48 (60.00)	24 (30.00)	8 (10.00)	0 (0.00)	46 (57.50)	24 (30.00)	10 (12.50)	0 (0.00)
5.	Transplanting	16 (20.00)	38 (47.50)	18 (22.50)	8 (10.00)	12 (15.00)	41 (51.25)	18 (22.50)	9 (12.50)
6.	Irrigation	42 (52.50)	12 (15.00)	22 (27.50)	4 (5.00)	36 (45.00)	18 (22.50)	22 (27.50)	4 (5.00)
7.	Fertilizer application	29 (36.25)	0 (0.00)	11 (13.75)	0 (0.00)	28 (35.00)	0 (0.00)	12 (15.00)	0 (0.00)
8.	Plant protection	59 (73.75)	2 (2.50)	5 (6.25)	2 (2.50)	56 (70.00)	3 (3.75)	5 (6.25)	4 (5.00)
9.	Watch and ward	28 (35.00)	26 (32.50)	10 (12.50)	16 (20.00)	25 (32.50)	29 (36.25)	4 (5.00)	22 (27.50)
10.	Picking	13 (16.25)	35 (43.75)	22 (27.50)	10 (12.50)	12 (15.00)	38 (47.50)	17 (21.25)	13 (16.25)
11.	Digging	40 (50.00)	17 (21.25)	20 (25.00)	2 (2.50)	32 (40.00)	17 (21.25)	17 (21.25)	3 (3.75)



12. Cleaning of produce	8 (10.00)	54 (67.50)	11 (13.75)	7 (8.75)	7 (8.75)	56 (70.00)	9 (11.25)	8 (10.00)
13. Taking produce to market	36 (45.00)	18 (22.50)	15 (18.75)	5 (6.25)	34 (42.50)	20 (25.00)	22 (27.50)	4 (5.00)
14. Sale of produce	14 (17.50)	58 (72.50)	8 (10.00)	0 (0.00)	16 (20.00)	59 (73.75)	5 (6.25)	0 (0.00)
$r = 0.978^{**}$					$r = 0.982^{**}$			

*Figures in parenthesis indicate percentage. ** Significant at one per cent level.*

The total may not add to 80 in the cases where the activities are not performed by all the households

Further pooled data presented in Table-1 shows that the participation of male farmers was maximum in land preparation (52.50%), direct sowing (60.00%), irrigation (52.50%), plant protection (73.75%) and digging (50.00%). The participation of female farmers was maximum in cleaning of produce (67.50%) and sale of produce (72.50%). The participation of male ranges from 10.00 to 73.75 percent with the maximum in plant protection and minimum in cleaning of produce. Female participation ranges from 0.00 to 72.5 percent with the maximum participation in sale of produce and minimum in fertilizer application.

To find out the extent of agreement in their responses the rank correlation was calculated and the values were 0.953 and 0.848 for male and female in Meghalaya respectively. Rank correlation values for Arunachal Pradesh were 0.965 and 0.992 for male and female respectively. The rank value of pooled data was 0.978 and 0.982 for males and females respectively which indicated high level of agreement with responses of the opposite partner.

Comparative analysis of participation of family members in vegetable cultivation activities

Results shown in Table-2 reveal the comparative picture of predominant participation of family in vegetable cultivation activities. According to male responses, plant protection was a male dominated activity in both the states. Transplanting, intercultural operation, picking, cleaning of produce and sale of produce were found to be female dominated activities in both the states. Land preparation, application of FYM, irrigation, direct sowing, watch and ward, digging and taking produce to market were carried out predominantly by male in Meghalaya, whereas the same activities were carried out predominantly by female farmers in Arunachal Pradesh. Preparation of nursery was the only one male dominated activity found in Meghalaya whereas this activity was carried out by male and female farmers jointly in Arunachal Pradesh. The findings are similar to Jaiswal et.al (2002).

Table 2 : Comparative analysis of participation of family members in vegetable cultivation

Activities	Meghalaya		Arunachal Pradesh		Pooled	
	MR	FR	MR	FR	MR	FR
Land Preparation	26 (M)	24 (M)	17 (F)	17 (F)	46(M)	40(MF)
Application of FYM	28 (M)	27 (M)	26 (F)	27 (F)	30 (M)	27 (F)
Preparation of nursery	18 (F)	19 (F)	22 (MF)	20 (MF)	32 (MF)	31 (F)
Direct sowing	40 (M)	40 (M)	24 (F)	24 (F)	48 (M)	41 (M)
Transplanting	16 (F)	18 (F)	22 (F)	23 (F)	38 (F)	41 (F)
Irrigation	30 (M)	26 (M)	13 (F)	14 (F)	42 (M)	36 (M)
Fertilizer application	29 (M)	28 (M)	NA	NA	29 (M)	28 (M)
Intercultural practices	18 (F)	22 (F)	27 (F)	30 (F)	NA	NA
Plant protection	38 (M)	36 (M)	21 (M)	20 (M)	59 (M)	56 (M)
Watch and ward	26 (M)	24 (M)	18(MF)	20 (F)	28 (M)	25 (M)
Picking (tomato,chilli etc.)	15 (F)	16 (F)	20 (F)	22 (F)	35(F)	38 (F)
Digging of ginger	28 (M)	30 (M)	17 (F)	17 (F)	40 (M)	32 (M)
Cleaning of produce	26 (F)	28 (F)	28 (F)	28 (F)	54 (F)	56 (F)
Taking produce to market	32 (M)	30 (M)	18 (F)	20 (F)	36 (M)	34 (M)
Sale of produce	26 (F)	24 (F)	32 (F)	35 (F)	58 (F)	59 (F)

Initials in parenthesis indicate the dominant participant.

M = Male; F = Female; MF = Male & Female; NA = Not applicable.

MR = Male Response, FR = Female Response.

Further, Table-2 indicates that the application of FYM, direct sowing, irrigation, Application, plant protection, watch and ward, digging and taking produce to the market, sale of produce were male dominated. The female dominated activities were transplanting, picking, cleaning of produce and selling of produce. The preparation of nursery was done jointly by both male and female farmers.

Inter and Intra State level participation of gender in vegetable cultivation

Information provided relating to inter and intra level participation of gender in vegetable cultivation in Table-3 depicts that the participation of male farmers was higher than the female farmers in Meghalaya. But in Arunachal Pradesh it was just the reverse. Further Table-3 indicates that male participation in Meghalaya was higher in comparison to male participation in Arunachal Pradesh. But female participation was higher in Arunachal Pradesh as compared with Meghalaya women.

Table-3: Inter and Intra State level participation of gender in vegetable cultivation

Gender	Meghalaya	Arunachal Pradesh
Male	58.16	16.96
Female	22.66	52.14

Average time spent by respondents in vegetable cultivation activities

Results relating to time spent in vegetable cultivation activities are presented in Table-4. The table indicates that the major time spent by male farmers in vegetable cultivation activities like land preparation, fertilizer application, plant protection, picking, digging, taking produce to market and sale of produce was 4.52, 3.37, 3.52, 4.21, 4.43, 5.42 and 3.17 hours per day respectively in Meghalaya, whereas female farmers spent 4.23, 4.11, 3.52, 4.24 and 5.56 hours on transplanting, picking, digging, cleaning of produce and sale of produce respectively. The other members of the family spent maximum time in watch and ward i.e. 4.38 hours. Therefore it can be said that the male farmers were spending more time as compared to females but this difference is very little as female farmers were probably doing household chores etc.

Further Table-4 depicts that in Arunachal Pradesh males were spending very less time in vegetable cultivation activities, not more than 50 percent in any activity, whereas female farmers were spending maximum time in sale of produce, children were assisting in transplanting, irrigation, intercultural practices, watch and ward, picking, digging, cleaning of produce. Thus males spent only 6 hours in vegetable cultivation during one season, whereas females spent a total time of 18.28 hours during one vegetable cultivation season, which was more than males.

Table 4 : Average time spent by respondents in vegetable cultivation

Sl. No.	Activities	Meghalaya (N=80)			Arunachal Pradesh (N=80)			Pooled (N=160)		
		M	F	AO	M	F	AO	M	F	AO
1.	Land Preparation	4.52	1.11	0.00	0.32	1.36	0.00	5.24	2.47	0.00
2.	Application of FYM	2.27	1.80	0.51	0.10	0.34	0.10	2.31	2.04	1.01
3.	Preparation of nursery	1.12	1.42	0.00	0.34	0.41	0.12	1.46	2.23	0.12
4.	Direct sowing	1.12	0.00	0.00	0.16	0.21	0.00	1.28	0.21	0.00
5.	Transplanting	2.16	4.23	2.14	1.16	1.46	0.30	3.32	6.09	2.44
6.	Irrigation	1.16	2.13	0.00	0.20	0.35	1.21	1.36	2.48	1.21
7.	Fertilizer application	3.37	2.19	0.00	0.00	0.00	0.00	3.37	2.19	0.00
8.	Intercultural practices	0.32	1.48	0.00	0.10	0.32	0.32	0.42	2.20	0.32
9.	Plant protection	3.52	0.00	1.12	0.16	0.15	0.00	4.08	0.15	1.12
10.	Watch and ward	0.46	1.35	4.38	0.10	0.12	0.40	0.56	1.47	5.18
11.	Picking	4.21	4.11	2.43	0.00	0.45	0.10	4.21	4.56	2.53
12.	Digging	4.43	3.52	0.00	1.20	1.15	0.15	6.03	5.07	0.15
13.	Cleaning of produce	0.46	4.24	2.13	0.00	1.25	1.48	0.46	5.49	4.01
14.	Taking produce to market	5.42	0.50	0.00	1.30	1.35	1.00	7.12	2.25	1.00
15.	Sale pf produce	3.17	5.56	0.00	0.00	6.56	0.00	3.17	12.52	0.00
		40.51	35.54	13.51	6.34	18.28	6.38	47.25	54.22	20.29

The pooled data in Table-4 indicates that the male farmers spent major time 6.03 and 7.12 hours in digging and taking produce to market whereas female farmers devoted 6.09 and 12.52 hours per day in transplanting and sale of produce respectively. The females spent 54.22 hours in one season of vegetable cultivation whereas males spent only 42.25 hours.

Further male farmers of Arunachal Pradesh spent more time (21.06 hours) as compared to 12.44 hours by male farmers of Meghalaya. This may be to get employment and to increase the income whereas female farmers of Meghalaya spent more time (7.50) as compared to female farmers of Arunachal Pradesh. Pooled data indicates that males and children were spending more time than females in vegetable cultivation in Meghalaya.

Conclusion

It may be concluded that in Meghalaya more than 50 percent of the activities of vegetable cultivation were done by the male farmers but it was the reverse in



case of Arunachal Pradesh where the participation of female farmers was more. So it can be concluded that vegetable cultivation should be commercialized instead of growing in kitchen garden so that participation can be increased and more income and employment generated.

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