Int.J.Curr.Microbiol.App.Sci (2020) *9*(11): 3195-3202

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 9 Number 11 (2020)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2020.911.385

Degree of Farm Women Participation in Sericulture Activities – A Study in Sivasagar District of Assam

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Keywords

Sericulture activities, Farm women participation in sericulture

Article Info

Accepted:
22 October 2020
Available Online:
10 November 2020

A B S T R A C T

The present investigation was carried out in Sivasagar district of Assam by interviewing 120 farm women selected randomly from 6 villages with an objective to assess profile characteristics and extent of participation of farm women in sericulture. Appropriate statistical was used for analysis and interpretation of data. The study revealed that middle aged farm women were associated with sericulture activities and sericulture contributed around 14% total annual family income. They practiced sericulture along with agriculture and wage earning for earning their livelihood. In case of host plant management majority of the respondents had partial participation in land preparation (70.00%)**,** seed sowing (51.67%)**, '**plantation maintenance' (55.00%)**, '**harvesting (55.00). But in case of grainage practices, it was cleared that most of the activities in case of grainage practices were performed by farm women alone. Cleaning of grainage room and equipments' (90.00%), 'preservation of seed cocoons'(82.50%), 'moth emergence, coupling and decoupling'(90.00%), 'mother moth examination' (53.33%) and 'surface sterilization of eggs' (80.83%) were some important activities with full participation of farm women. Likewise , farm women were involved almost all activities of silk rearing like disinfection of rearing room and equipments, selection of races, season selection, incubation of eggs, black boxing, brushing of chawki worms, maintenance of larva, bed cleaning, handling of moulting larva , collection of matured worms, harvesting of cocoons In overall 62.5 percentage respondents had medium participation in agriculture activities. The concern department should be put sincere efforts for empowerment of farm women through sericulture by providing skill orientated programme to farm women along with creation of common facilities or provide small scale credit to them.

Introduction

Women are the backbone of development of any nation. In India, the females comprise 48.04% of the total population and majority of Indian females are participated in agriculture and its allied sector (anon., 2020a). The economy of India is basically based on agriculture and allied sectors. Along with agriculture, sericulture pick up as occupation by most of the rural women for their livelihood. The unique feature of sericulture activity is its egalitarianism—sericulture growers rich or poor, earn the same income from it. Women play crucial role in the activities of sericulture and it

equally creates opportunities and make them independent socially, economically, politically, and otherwise (Geetha and Indira, 2010, 2011; Pillai and Shanta, 2011; Thomas *et al.*, 2010). In Indian condition women have been generally termed as home-makers. Women spend 16– 18 hours a day working at home and outside, but still their contribution is often unrecognized and undervalued. In fact, women have to bear double burden in the development process as they play triple role i.e. production, reproduction and community roles. Sericulture is one of the income generating activities of rural women specifically in some region and castes and tribes. It has been seen that the sericulture activity brings regular income to the community without any bias of caste, creed, gender, or religion (Kasi, 2013). Assam, a north eastern state of India has a tradition of sericulture and weaving, particularly among the rural women. Mahatma Gandhi termed Assamese women as "Weaving wizard that weaves. Assam has a unique position in the world sericulture map for production of vanya silk. The importance of silk in Indian economy is evident by the fact that 18 percent of the global raw silk is produced in India and out of that raw silk 65 % eri and 95% muga silk is produced in Assam (Annon., 2019). Considering crucial role played by farm women in sericulture activities the present study was planned to assess profile characteristics of farm women participated in sericulture activities and their degree of participation in this venture.

Materials and Methods

The present investigation was carried out in sivasagar district as it is one of the important silkworm growing districts of Assam and in Sivasagar district sericulture is practiced in large scale almost in every village from the time of *ahom* reign. A total of 120 farm women were selected as respondents by following simple random sampling technique from six randomly selected villages namely Dewbil napamia gaon, Dewbil boruah gaon, Lalimsinga gaon, Boraibari gaon, Pulpanisinga gaon, Belimukhia gaon. In order to assess the extent of participation of farm women in sericulture firstly the activities are divided into three heads namely host plant management, grainage technology and rearing technology and total 31 important activities were identified in sericulture. The response against each activities were recorded on a three point continuum namely, 'full participation', 'partial participation' and 'no participation' with the score of 2, 1 and 0, respectively. Based on total obtained scores Mean ($\bar{x}$) and Standard deviation (SD) were calculated and respondents were classified as follows low (below 32.72), medium (32.72-54.32) and high (above 54.32). Again, activities were ranked based on weigtage mean score of each sericulture activity. Appropriate statistical tools were used for analysis and interpretation of data.

Results and Discussion

Profile characteristics of farm women participated in sericulture activities

The findings revealed that the majority of the respondents i.e. women silkworm rearers were belonged to middle age category 30-50 years *i.e*. 51.67 percent, educated up to high school level *(*45.83%), having joint family (60%), medium sized family with 5-7 members (44.17%). Most of the women sericulture rearer were married(89.17%), 55% respondents were involved in sericulture + agriculture + wage earnings in case of occupation and 84.16% respondents were under the category of marginal farmer(less than 1 ha). In case of experience in sericulture 64.17% had medium level of experience, majority (55.83%) of the respondents belonged to group with annual income up to

Rs. 70,000 and out of that about 59.17 % respondents earned income up to Rs. 10,000 annually from sericulture. Most of them i.e. 63.33 % sericulture farmers had total host plants between 15-30 numbers. It can inferred that middle aged farm women were associated with sericulture activities and sericulture contributed around 14% total annual family income. Farm women practiced sericulture along with agriculture and other source of income for earning their livelihood (Table 1).

Table.1 Profile characteristics of farm women participated in sericulture activities (N=120)

Sl no	Profile characteristics of farm women		Frequency	percentage
1	Age	Below 35 years	24	20.00
		Between 35-50 years	62	51.67
		Above 50 years	34	28.33
2	Educational level	Illiterate	6	5.00
		Upto primary level	34	28.33
		Upto high school level	55	45.83
		Upto higher secondary level	21	17.50
		Upto graduation level	4	3.33
		Upto Post graduation	0	0.00
3	Type of family	Nuclear	49	40.83
		Joint	71	59.17
4	Size of family	Small (upto 4 members)	43	35.83
		Medium (4-7 members)	53	44.17
		Large(above 7 members)	24	20
5	Marital status	Single	8	6.67
		Married	107	89.17
		Widow/Divorcee	5	4.17
6	Occupation	Sericulture	0	0.00
		Seri+Agri	31	25.83
		Seri+Wage	3	2.5
		Seri+Service	2	1.66
		Seri+Business	4	3.33
		Seri+Agri+Wage	66	55.00
		Seri+Agri+Business	9	7.5
		Seri+Agri+Service	5	4.16
7	Size of operational land holdings	Marginal farmer	101	84.16
		Small farmer	15	12.5
		Semi medium farmer	4	3.33
8	Experience in sericulture	Low	23	19.17
		Medium	77	64.17
		High	20	16.67
9	Annual family income	Up to Rs 70000	67	55.83
		Rs70001-150000	40	33.33
		Rs 150001-300000	12	10.00
		Above Rs 300000	1	0.83
10	Availability of host plant	Less(upto 15 nos)	11	9.17
		Medium(15-30 nos)	76	63.33
		More(above 30 Nos)	33	27.50

Table.2 Distribution of respondents according to frequency of participation in sericulture activities n=120

Sl no	Category	Full participation		partial Participation		No Participation	
		F	%	F	%	F	%
A	**Host plant management**						
1	Land preparation	13	10.83	84	70.00	23	19.17
2	Seed collection	29	24.17	45	37.50	46	38.33
3	Seed sowing	21	17.50	62	51.67	37	30.83
4	Fertilizer application	21	17.50	50	41.67	49	40.83
5	Weeding	40	33.33	57	47.50	23	19.17
6	Prunning	12	10.00	28	23.33	80	66.67
7	Pest and disease management	35	29.17	66	55.00	19	15.83
8	Harvesting of leaves	54	45.00	66	55.00	0	0.00
B	**Grainage practices**						
9	Cleaning of grainage room and equipments	108	90.00	12	10.00	0	0.00
10	Seed cocoon selection	51	42.50	24	20.00	45	37.50
11	Seed cocoon collection and transportation	44	36.67	28	23.33	48	40.00
12	Preservation of seed cocoon	99	82.50	21	17.50	0	0.00
13	Coupling and decoupling of moths	108	90.00	12	10.00	0	0.00
14	Examination pebrine spore in mother moth	64	53.33	56	46.67	0	0.00
15	Surface sterilization of eggs	97	80.83	23	19.17	0	0.00
16	Transportation of DFL	14	11.67	29	24.17	77	64.17
C	**Rearing practices**						
17	Disinfection of rearing equipments	106	88.33	14	11.67	0	0.00
18	Selection of silkworm breeds	55	45.83	34	28.33	31	25.83
19	Selection of rearing season	55	45.83	46	38.33	19	15.83
20	Incubation of silkworm eggs	94	78.33	26	21.67	0	0.00
21	Black boxing of silkworm eggs	93	77.50	27	22.50	0	0.00
22	Brushing of newly hatch silkworm	59	49.17	51	42.50	10	8.33
23	Hygiene and cleaning of rearing room	56	46.67	53	44.17	11	9.17
24	Prophylactic measures against disease and pest of silkworm larvae	53	44.17	58	48.33	9	7.50
25	Feeding of silkworm	50	41.67	67	55.83	3	2.50
26	Cleaning of silkworm bed	103	85.83	17	14.17	0	0.00
27	Maintenance of spacing among silkworm	48	40.00	49	40.83	23	19.17
28	Handling of moulting larvae	73	60.83	47	39.17	0	0.00
29	Handling of dead silk worms	49	40.83	63	52.50	8	6.67
30	Collection of matured silk worms	84	70.00	36	30.00	0	0.00
31	Harvesting of cocoons	79	65.83	41	34.17	0	0.00
32	Sorting of cocoon	76	63.33	44	36.67	0	0.00

Table.3 Distribution of respondents according to level of participation in sericulture activities n=120

Category	Score	F	%	Mean	SD	CV
Low	Below 32.72	24	20.0			
Medium	Between 32.72-54.32	75	62.5	43.52	10.80	29.79
High	Above 54.32	21	17.5			
Total		120	100			

Table.4 Ranking of sericulture activities according to the participation level of Farm women n=120

Sl no	Category	Weightage mean score	Rank
A	**Host plant management**		
1	Land preparation	0.92	XXV
2	Seed collection	0.86	XXVII
3	Seed sowing	0.87	XXVI
4	Fertilizer application	0.77	XXVII
5	Weeding	1.14	XXI
6	Prunning	0.43	XXIX
7	Pest and disease management	1.13	XXII
8	Harvesting of leaves	1.45	XII
B	**Grainage practices**		
9	Cleaning of grainage room and equipments	1.90	I
10	Seed cocoon selection	1.05	XXIII
11	Seed cocoon collection and transportation	0.97	XXIV
12	Preservation of seed cocoon	1.83	IV
13	Coupling and decoupling of moths	1.90	I
14	Examination pebrine spore in mother moth	1.53	XI
15	Surface sterilization of eggs	1.81	V
16	Transportation of DFL	0.48	XXVIII
C	**REARING TECHNOLOGY**		
17	Disinfection of rearing equipments	1.88	II
18	Selection of silkworm breeds	1.20	XX
19	Selection of rearing season	1.30	XVIII
20	Incubation of silkworm eggs	1.78	VI
21	Black boxing of silkworm eggs	1.78	VI
22	Brushing of newly hatch silkworm	1.41	XIII
23	Hygiene and cleaning of rearing room	1.38	XV
24	Prophylactic measures against disease and pest of silkworm larvae	1.37	XVI
25	Feeding of silkworm	1.39	XIV
26	Cleaning of silkworm bed	1.86	III
27	Maintenance of spacing among silkworm	1.21	XIX
28	Handling of moulting larvae	1.61	X
29	Handling of dead silk worms	1.34	XVII
30	Collection of matured silk worms	1.70	VII
31	Harvesting of cocoons	1.66	VIII
32	Sorting of cocoon	1.63	IX

Extent of participation of the farm women in different sericulture activities

The information regarding operation-wise participation of the farm women in sericulture activities is given in Table 2. Sericulture involves lots of activities beginning with the cultivation of host plants to harvesting of leaves for feeding of silkworm and the rearing of silkworm from the egg to harvesting of cocoon. In case of host plant management the data presented in Table-2 revealed that majority of the respondents had partial participation in the operations viz. land preparation (70.00%), seed sowing (51.67%), fertilizer application (41.67%), pest and disease management (55.00%), weeding (47.50%), harvesting of leaves (55.00) while majority of the respondents had never participated in seed collection (38.33%) and pruning operations(66.67%). This indicates that women farmers participated in host plant cultivation as co worker with their counterpart. Social taboos may be one reason as host plant cultivation generally practiced in outside the home stead area.

In case of grainage practices, majority of the respondents had full participation in the operations viz. 'cleaning of grainage room and equipments' (90.00%), 'preservation of seed cocoons'(82.50%), 'moth emergence, coupling and decoupling'(90.00%), 'mother moth examination' (53.33%), 'surface sterilization of eggs' (80.83%). On the other hand majority of them had never participated in 'transportation Disease Free Laying' (64.17%) and 'Seed cocoon collection and transportation' (40%). It can be interpreted that most of the activities in case of grainage practices were performed by farm women alone.

In case of rearing of silkworm it was cleared from the table 2 that majority of the respondents had full participation in the operations of rearing of silkworms viz. 'disinfection of rearing room and equipments'(88.33%), 'selection of silkworm breeds' (45.83%), 'selection of rearing season' (45.83%), 'incubation of eggs'(78.33%), 'black boxing' (77.50%), 'brushing of newly hatched silkworm(49.17%), 'bed cleaning'(85.83%), 'handling of moulting larva' (60.83%), 'hygiene maintenance and cleaning of rearing of rearing room' (46.67%), 'Prophylactic measures against disease' (44.17%), 'spacing maintenance' (40.00%), 'collection of matured worms' (70.00%), 'harvesting of cocoons'(65.83%), and 'sorting of cocoon(63.33%) while majority of the respondents had partial participation in 'feeding of silkworms' (55.83?%) and 'handling of dead worms' (52.50%). This indicates that mostly farm women are more involved in activities of silkworm rearings.

The data with respect to overall extent of participation of the respondents in different silk rearing activities are presented in Table 3 and it is observed that a majority (62.50%) of the respondents had medium level of participation in sericulture activities. While, 20 per cent had low and 17.5 per cent had high level of participation in agriculture activities. Similar findings were reported by Devi, *et al.,* (2018*).* This may be due to that women participated in some selected practices of host plant cultivation and grainage practices. Again, in most of the outdoor activities women were participated as co workers.

Ranking of activities according to their level of participation

Ranking was done based on weightage mean score. The table 4 revealed that 'cleaning of grainage room and equipments' and 'coupling and decoupling of moths' occupied the 1st position in ranking of activities of women

participation. These two activities are solely performed by women. Without the help of male members of family women sericulture rearer alone can clean all the grainage equipments and grainage room before production of disease free layings. Likewise coupling and decoupling is also very important for egg laying which is also solely done by women. Then disinfection of rearing equipments occupies the 2nd position in ranking. It is a very important activities performed by women for successful rearing. In fact, disinfection, before and after each rearing is considered the key for a successful cocoon crop. To protect from pathogens, special attention is needed for disinfection of every nook and corner of the rearing house and appliance which should be carried out on bright sunny days. The 3rd rank was occupied by cleaning of silkworm bed. As soon as the larvae grow-up, the unconsumed leaves and litter increase in the rearing bed which ultimately favour multiplication of pathogenic organisms. Hence, timely bed cleaning is essential to keep the worms healthy which are mostly done by women. Preservation of seed cocoon and surface sterilization of eggs occupied the 4th and 5th rank. Cocoons are preserved in a single layer for proper aeration which is most essential for proper development of moth. Surface sterilization of eggs should be ensured to avoid contamination and it helps in removal of pathogens adhering to the egg shells and also prevents secondary contamination. Black boxing and incubation of silkworm eggs occupied the 6th and 7th rank. Incubation is a process in which the eggs are made to hatch under an ideal temperature, humidity, light, etc. If incubation is done the rate of hatching and the health of the young worms will be ensured; ultimately the cocoon quality and yield also will be improved. Black boxing is done by keeping the eggs under total; darkness either by wrapping them in black paper or keeping them in a black box or dark room. It is carried out to ensure the simultaneous hatching of eggs. Collection of matured silk worms was ranked in 8th position. Before this process, the required number of mountages should be kept ready well in time. The worms should be collected carefully for mounting and all these activities are carried out mainly by women. The 9th rank was occupied by the activity sorting of cocoon which is carried out in a dark room. It is done by women to remove the defective cocoons from healthy cocoons. Handling of moulting larva occupied 10th position. Moulting is a very sensitive period during which the worms cast off its old skin and the body is soft and delicate. A good rearing is judged by the uniformity of the larvae entering into moulting and emerging from moulting. The brushing and feeding of the worms play key role for uniform moulting. It is important to keep the rearing bed dry when the worms are in moult. No bed cleaning should be done during moulting of silkworms. Women participation is comparatively less in case of host plant management.

In conclusion the economically poor, middle aged and marginal category of farm women were engaged in sericulture activities along with other income generating activities. The concern department should be put sincere efforts for empowerment of farm women through sericulture either in the form of common facilities creation or provide small scale credit to farm women. Farm women participate in almost all activities of sericulture. But some important activities of sericulture like cleaning of grainage room and equipments, coupling and decoupling of moths, were performed by farm women alone. So, training and other extension agency should give special emphasis on those activities while in planning of training programme or other skill oriented programme. Most of the women entrepreneurs involved in sericulture have

minimum educational qualification, so government and sericulture department can organize effective training and development activities for them, which will ultimately reduce the problems and also enable the women entrepreneurs to overcome the obstacles.

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How to cite this article:

Rekhamoni Gogoi and Sundar Barman. 2020. Degree of Farm Women Participation in Sericulture Activities – A Study in Sivasagar District of Assam. *Int.J.Curr.Microbiol.App.Sci.* 9(11): 3195-3202. doi: https://doi.org/10.20546/ijcmas.2020.911.385