

## **To Document the Role and Responsibilities of Extension Workers for Promotion of Sericulture Industry in Jammu & Kashmir**

### **Abstract**

**Aim:** Bivoltine silk produced in Jammu and Kashmir is well recognized on global context but even though having most congenial climatic conditions, the raw silk yield is quite low. The reasons can be attributed to lack of awareness on proper rearing practices among the farmers and adoption rate of improved technologies. Therefore, current study was formulated to document the role and responsibilities of various research and extension intuitions for progressive development of silk industry in Jammu and Kashmir (J and K).

**Study Design:** Field Survey study.

**Place and duration of the study:** The current study was framed at Post Graduation Department of Sericulture, Poonch Campus, University of Jammu and survey was conducted in Poonch district of J and K, India during the year 2021.

**Methodology:** The survey was conducted with selected (25) farmers and data was collected in the form of questionnaire.

**Results:** Among 25 respondents, only 08 farmers were observed to belong middle age group of (35 to 50 years) and 72% of them were recorded with minimum education level of below 10<sup>th</sup> standard. 21 farmers were reported to have more than 20 years of experience in sericulture and on the same hand, were recorded to possess very less exposure with extension workers on occasional basis viz., 72% and only 15 number of farmers were reported to have attended training programmes and none of them have attended workshops and kissan melas etc. Thus, the study revealed the strong need of collaboration between the farmers and extension servants for strengthening sericulture.

**Conclusion:** Extension functionaries should educate the farmers for adoption of improved technologies to narrow down yield gaps at farmer level. This would help not only to improve the farmers yield realization but also increase their income through sericulture in the long run.

**Keywords:** extension, sericulture, yield, role, responsibilities

### **Introduction**

India poised to reach the position of second largest silk producer after China, known for producing all the four known commercial silk varieties viz, Mulberry, Tasar, Eri and Muga. In

spite of the annual compound growth rate of 4.93% of mulberry raw silk production during the year 2004 to 2015, country still has to export huge quantity of raw silk from the China every year to meet the growth domestic as well as export demand [11 & 2] which represents the actual scenario of productivity demanding progressive development in the field of sericulture and could be realized with the active participation of research and extension institutions.

J and K even though having congenial climatic conditions favourable for silkworm rearing and obtaining higher productivity, but unfortunately the average yield is quiet low because of various factors. Therefore, in order to cope these drawbacks, various research and extension institutions working towards the progressive development of sericulture including SKUAST-Jammu, SKUAST-Kashmir, Central Silk Board with its extensions like CSRTI Pampore, Regional Sericulture Research Station Miran sahib (RSRS), Research Extension Centers (REC), sub-units of RECs, State Sericulture Development Department (SSDD) and Department of Sericulture, University of Jammu are actively involved for formulating strategies and their direct implementation by organizing various extension activities. Thus it becomes the responsibility of such instructions to pay attention towards the development of sericulture status in the Union Territory (U.T.) of J and K so as to improve the overall production at national and international level. In this direction state and central sericulture intuitions has programmed new initiatives [13]. As part of the extension activity, the division of sericulture of SKUAST-Jammu and SKUAST-Kashmir has adopted different villages for demonstrating package of practices. Thus an attempt has been carried out aiming to document various roles and responsibilities of all institutes and research centres associated with sericulture in Jammu and Kashmir.

## **Materials and methods**

The methodology adopted for the present study was framed in the form of questionnaire and data on various aspects of sericulture was collected by personal interview of the selected farmers as presented under results section.

## **Results & Discussion**

### **1. General Information of the Farmers**

The data on the general information of the farmers and knowledge about sericulture among the respondents of the present survey have been described in Table-1 and Table-2. Low literacy rate recorded among the sericulture farmers have been found to pose negative impact on the adoption of latest technologies as earlier reported by Chauhan *et al.*, 2016 and Girish *et al.*, 2020 [5 &7]. In addition to education, experience in sericulture and less participation of family members was

recorded to be low in present survey. As less experience in silkworm rearing recorded among the respondents accounted for low yield and this finding lies in close conformity with the results obtained by Shinghvi *et al.*, 1994; Sreenivas *et al.*, 2009, Chauhan *et al.*, 2016, Chanotra *et al.*, 2021a and Chanotra *et al.*, 2021b [14, 17, 5, 3 & 4]. The current study also suggested utilizing agricultural land with integration of mulberry plants for improving the productivity status. Similar reports have been made by Fatima, K. 2013; Khan *et al.* 2018 and Kumar *et al.*, 2018 [6, 8 & 10], who also described that area is the basic requirement for any agricultural activity.

## **2. Sericulture Oriented Exposure /Participation in Sericulture Oriented Programmes**

The detail regarding knowledge of the farmers on sericulture and rearing technology was recorded to be low as presented in Table-3. On the same hand, the farmers were reported to have less interaction with the experts of State Sericulture Department and Central Silk Board. Moreover, the SSD and CSB also recorded to arrange training, awareness and extension programmes etc. for promotion of sericulture but unfortunately very less number of farmers were reported to attend such programmes. They were only reported to have attended training programmes and very few to have attended the Kissan Mela and field trips which revealed lack of awareness among the farmers on importance of such programmes. Similar results have been also reported by Khan *et al.*, 2010 and Khan *et al.*, 2018 [8 & 9], who demonstrated impact of cluster promotion programme in Bandipora district of Jammu and Kashmir which resulted in improvement of the socio-economic conditions of farmers and also strengthened the long production chain of sericulture. The method of acquiring sericulture information had effect on effective training. So extension education programmes have vital roles to play in sericulture as suggested by Singh *et al.*, 2015 and Singh *et al.*, 2020 [16 & 15].

## **3. Support of Govt. Under Various Schemes for Development of Sericulture.**

Among the studied respondent (n-25) maximum farmers have awareness about the support for construction of rearing house but only 72 per cent farmers availed this scheme. Knowledge on Installment of hot air oven, Establishment of reeling unit, Incentives on silk yarn and Health insurance, Catalytic Development Programme (CDP), Schemes of women empowerment and Agricultural Technology Management Agency (ATMA) was negligible as only 20 per cent farmers availed installment of hot air oven and rest of the schemes were recorded with no respondents as they either don't have awareness about these schemes or don't have availed benefit out of these as presented in the Table-4. Farmers were recorded to have awareness about various schemes of CSB but negligible number of farmers was reported to be associated with

them as described in Table-5 and figure-1. Earlier, Sreenivas *et al.*, 2009 and Singh *et al.*, 2015 [17 & 16] suggested significance of trainings for improving the crop yield.

#### **4. Mass Media Exposure to the Farmers**

Among various means of mass media exposure majority of the farmers were reported to be associated with radio on regular basis as 100 per cent of the respondents were recorded to have exposure to radio followed by Television (T.V.) as 40 per cent on regular and 40 per cent on occasional basis. None of the respondents were reported to have any exposure to agricultural magazines and pamphlets (Table-6 and figure-2) Khan *et al.*, 2010, Khan *et al.*, 2018 and Chanotra *et al.*, 2022 [9, 8 & 1] emphasized the importance of training programmes and mass media exposure for strengthening sericulture industry in the U.T.

#### **5. Role and Responsibilities of Research Institutions for Development of Sericulture**

Various research and extension institutes associated with sericulture like SKUAST- Jammu and Kashmir, SSDD, CSB, RSRS and CSR & TI, Pampore were reported to be actively engaged in various research and developmental oriented projects for promotion and extension of sericulture in the state. All the institutions were recorded with the prime role and responsibilities in the field of research on raising mulberry, supply of healthy parental material for making cuttings, breeding of disease resistant varieties, breeding of pest resistant varieties, breeding of varieties with improved quality parameters, formulation of ecofriendly and effective pesticides, fixation of LC-50 and LD-50 values, recommendation of package of practices for mulberry cultivation (POP), recommendation of package of practices for silkworm rearing (POP), breeding of superior silkworm hybrids, breeding of disease resistant silkworm hybrids, breeding of pest resistant silkworm hybrids and breeding of silkworm hybrids with improved qualitative parameters etc. Moreover, Department of Sericulture, Poonch Campus, University of Jammu were recorded to play prime role in education sector for promotion of sericulture among the youth as earlier suggested by Chouhan *et al.*, 2016 and Setty *et al.*, 2019 [5 & 12]. Some of the important roles and responsibilities have been enumerated as below:

1. Commencement of training and skill development programmes for shapening and improving the technical skills of the workers.
2. Conduct technical awareness programmes to enhance knowledge of the workers for operating different types of machines.
3. Development of package of practices for introduction of improved sericulture Technologies and its dissemination.

4. Efforts to reduce input cost & drudgery and by-product utilization to increase net income and productivity.
5. Dissemination of knowledge, Research and Development (R & D) innovations and package of practices.
6. Undertake collaborative Research Programmes/Projects with reputed National and International R & D institutions.
7. Strengthening institutional framework to support ongoing research, allied activities, scientific and technical services.
8. Conduct On-station trials (OST) and On-farm trials (OFT) for test verifying the technologies developed by the main research institutes and suggest fine tuning/modifications of such technologies to provide solutions to region specific problems.
9. Conduct on-farm trials (OFT)/ demonstration of the selected technologies with selected farmers in coordination with Department of Sericulture (DOS).
10. Popularize the proven technologies using various extension methods through cluster area approach.
11. Conduct training for both grass root level extension staff of DOS and farmers on advanced technological aspects.
12. Provide assistance in establishment of reeling, weaving, printing and dyeing units and financial assistance for acquiring machines.
13. Conduct Transfer of Technology (TOT) trials among the selected farmers.

**Figure-1: Support of Govt. under various schemes for development of Sericulture.**

**Figure-2: Mass media exposure to the farmers in percentage.**

**Table 1: General Information of the farmer**

| <b>Sl. No.</b>                          | <b>Category</b>        | <b>Criteria</b> | <b>No. of Farmers</b> | <b>Percentage (%)</b> |
|---|------------------------|-----------------|-----------------------|-----------------------|
| <b>1. Age (in years)</b>                |                        |                 |                       |                       |
| a                                       | Young                  | < 35            | 04                    | 16                    |
| b                                       | Middle                 | 35-50           | 08                    | 32                    |
| c                                       | Old                    | >50             | 13                    | 52                    |
| <b>2. Education (in standards)</b>      |                        |                 |                       |                       |
| a                                       | Illiterate             | 0               | 06                    | 24                    |
| b                                       | Below 10 <sup>th</sup> | 1-4             | 18                    | 72                    |
| c                                       | 12 <sup>th</sup>       | 5-10            | 01                    | 4                     |
| d                                       | Graduate               | 11-12           | 0                     | 0                     |
| e                                       | Post-graduate          | -               | 0                     | 0                     |
| <b>3. Family size (No.)</b>             |                        |                 |                       |                       |
| a                                       | Big                    | >4              | 01                    | 4                     |
| b                                       | Medium                 | 4-6             | 21                    | 84                    |
| c                                       | Small                  | <6              | 03                    | 12                    |
| <b>4. Land holding (Area in kanals)</b> |                        |                 |                       |                       |
| a                                       | Small                  | >5              | 05                    | 20                    |
| b                                       | Medium                 | 5-10            | 19                    | 76                    |
| c                                       | Big                    | <10             | 1                     | 4                     |
| <b>5. Primary occupation</b>            |                        |                 |                       |                       |

|  |                              |       |    |     |
|--|------------------------------|-------|----|-----|
| a  | Agriculture                  | -     | 25 | 100 |
| b  | Agriculture with Sericulture | -     | 25 | 100 |
| c  | Service                      | -     | 02 | 08  |
| <b>6. Experience in Agriculture (in years)</b> |                              |       |    |     |
| a  | Less                         | >10   | 0  | 0   |
| b  | Medium                       | 10-20 | 04 | 16  |
| c  | More                         | <20   | 21 | 84  |
| <b>7. Experience in Sericulture (in years)</b> |                              |       |    |     |
| a  | Less                         | >10   | 08 | 32  |
| b  | Medium                       | 10-20 | 14 | 56  |
| c  | More                         | <20   | 03 | 12  |

**Table-2: Information about Sericulture**

|   |                      |  |    |     |
|---|----------------------|--|----|-----|
| <b>• Mulberry Production Practices</b>  |                      |  |    |     |
| <b>1. Practice mulberry cultivation</b> |                      |  |    |     |
| a.                                      | Yes                  |  | 16 | 64  |
| b.                                      | No                   |  | 09 | 40  |
| <b>2. Area Under Cultivation</b>        |                      |  |    |     |
| A                                       | Irrigated            |  | 20 | 80  |
| B                                       | Rainfed              |  | 05 | 20  |
| <b>3. Methods of irrigation</b>         |                      |  |    |     |
| A                                       | Channel Irrigation   |  | 25 | 100 |
| B                                       | Sprinkler Irrigation |  | -  | -   |
| C                                       | Drip Irrigation      |  | -  | -   |
| <b>4. Having separate Chawki Garden</b> |                      |  |    |     |
| A                                       | Yes                  |  | 0  | 0   |
| B                                       | No                   |  | 25 | 100 |
| <b>5. Fertilizer Input added</b>        |                      |  |    |     |
| A                                       | Yes                  |  | 8  | 32  |
| B                                       | No                   |  | 17 | 68  |

| <b>6. Type of mulberry cultivation</b>            |  |    |     |
|---|--|----|-----|
| A   | Separate mulberry fields                 | 02 | 8   |
| B   | Integrated farming or mix farming        | 23 | 98  |
| <b>• Silkworm Rearing Practices</b>               |  |    |     |
| <b>1.Type of rearing house</b>                    |  |    |     |
| a.  | Mud type of rearing house                | 4  | 16  |
| b.  | Concrete or cemented rearing house       | 0  | 0   |
| c.  | Don't have a separate rearing house      | 18 | 72  |
| d.  | Separate room in dwelling house          | 3  | 12  |
| <b>2.Source of procurement of silkworm seed</b>   |  |    |     |
| a.  | State Sericulture Development Department | 25 | 100 |
| b.  | Central Silk Board                       | 0  | 0   |
| c.  | Progressive farmers                      | 0  | 0   |
| <b>3. Name of Silkworm breed</b>                  |  |    |     |
| a.  | FC1 FC2                                  | 25 | 100 |
| b.  | Any other                                | 0  | 0   |
| <b>4. Procure Eggs or Chawki worms</b>            |  |    |     |
| a.  | Silkworm Eggs                            | 25 | 100 |
| b.  | Chawki worms                             | 0  | 0   |
| <b>5. Distance from procurement station (kms)</b> |  |    |     |
| a.  | >15                                      | 05 | 20  |
| b.  | 15-20                                    | 15 | 60  |
| c.  | <20                                      | 5  | 20  |
| <b>6. Commencement of Disinfection</b>            |  |    |     |
| A   | Yes                                      | 15 | 60  |
| B   | No                                       | 10 | 40  |

| <b>7. Method of rearing</b>                             |                               |    |     |
|---|-------------------------------|----|-----|
| A   | Tray rearing                  | 21 | 84  |
| B   | Floor rearing                 | 03 | 12  |
| C   | Shelf rearing                 | 01 | 4   |
| D   | Box rearing                   | 0  | 0   |
| <b>8. Frequency of feeding</b>                          |                               |    |     |
| A   | Twice a day                   | 2  | 8   |
| B   | Three times per day           | 20 | 80  |
| C   | Four times per day            | 3  | 12  |
| <b>9. Frequency of cleaning</b>                         |                               |    |     |
| A   | Twice in a instar             | 10 | 40  |
| B   | Ones after each moult         | 15 | 60  |
| <b>10. Frequency of application of bed disinfectant</b> |                               |    |     |
| A   | Twice in a instar             | 12 | 48  |
| B   | Ones after each moult         | 13 | 52  |
| <b>11. Types of mountages used</b>                      |                               |    |     |
| A   | Plastic collapsible mountages | 21 | 84  |
| B   | Rotary mountages              | 0  | 0   |
| C   | Bottle brush mountages        | 0  | 0   |
| D   | Local mountages material      | 04 | 16  |
| <b>• COCON MARKETING</b>                                |                               |    |     |
| <b>12. Is there any cocoon market available</b>         |                               |    |     |
| A   | Yes                           | 25 | 100 |
| B   | No                            | 0  | 0   |
| <b>• INTERACTION WITH EXPERTS AND EXTENSION WORKERS</b> |                               |    |     |
| <b>13. Interaction with experts</b>                     |                               |    |     |
| A   | Regular                       | 07 | 28  |
| B   | Occasional                    | 18 | 72  |
| C   | Frequent                      | 0  | 0   |
| <b>14. Interaction with extension workers</b>           |                               |    |     |

|   |            |    |    |
|---|------------|----|----|
| A | Regular    | 12 | 48 |
| B | Occasional | 13 | 52 |
| C | Frequent   | 0  | 0  |

**Table-3: Sericulture oriented exposure /Participation in Sericulture oriented programmes**

| S.no. | Category          | No. Of farmers participated | Duration | No. of programmes attended | Percentage |
|-------|-------------------|-----------------------------|----------|----------------------------|------------|
| 1.    | Trainings         | 15                          | 15 days  | 1-2                        | 60         |
| 2.    | Workshops         | 0                           | 0        | 0                          | 0          |
| 3.    | Exhibitions       | 0                           | 0        | 0                          | 0          |
| 4.    | Seminars          | 0                           | 0        | 0                          | 0          |
| 5.    | Conferences       | 0                           | 0        | 0                          | 0          |
| 6.    | Kissan mela       | 8                           | 03       | 1-2                        | 32         |
| 8.    | Exposure visits   | 0                           | 0        | 0                          | 0          |
| 9.    | Field days/ trips | 5                           | 1        | 1                          | 20         |
| 10.   | Any other         | -                           | -        | -                          | -          |

**Table-4: Support provided by State Sericulture Development Department in different aspects of sericulture.**

| Sl. No. | Category                                  | No. of farmers |         |                | Benefit availed |    |                |
|---------|---|----------------|---------|----------------|-----------------|----|----------------|
|         |   | Aware          | Unaware | Percentage (%) | Yes             | No | Percentage (%) |
| 1       | Support for raising mulberry              | 25             | 0       | 100            | 20              | 5  | 80             |
| 2       | Supply of saplings/ cuttings              | 25             | 0       | 100            | 25              | 0  | 100            |
| 3       | Supply of rearing appliances              | 25             | 0       | 100            | 25              | 0  | 100            |
| 4       | Support for construction of rearing house | 25             | 0       | 100            | 18              | 07 | 72             |
| 5       | Installment of hot air                    | 20             | 5       | 20             | 5               | 20 | 20             |

|    |  |    |    |    |   |    |   |
|----|--|----|----|----|---|----|---|
|    | oven   |    |    |    |   |    |   |
| 6  | Establishment of reeling unit                    | 20 | 5  | 20 | 0 | 25 | 0 |
| 7  | Incentives on silk yarn                          | 15 | 10 | 60 | 0 | 25 | 0 |
| 8  | Health insurance                                 | 15 | 10 | 60 | 0 | 25 | 0 |
| 9  | Catalytic Development Programme (CDP)            | 10 | 15 | 40 | 0 | 26 | 0 |
| 10 | Schemes of women empowerment                     | 10 | 15 | 40 | 0 | 25 | 0 |
| 11 | Agricultural Technology Management Agency (ATMA) | 0  | 25 | 0  | 0 | 25 | 0 |

**Table-5: Support provided by Central Silk Board in different aspects of sericulture**

| Sl. No. | Category                                  | No. of farmers |         |                | Benefit availed |    |                |
|---------|---|----------------|---------|----------------|-----------------|----|----------------|
|         |   | Aware          | Unaware | Percentage (%) | Yes             | No | Percentage (%) |
| 1       | Support for raising mulberry              | 25             | 0       | 100            | 10              | 15 | 40             |
| 2       | Supply of saplings/ cuttings              | 25             | 0       | 100            | 10              | 15 | 40             |
| 3       | Supply of rearing appliances              | 25             | 0       | 100            | 5               | 20 | 20             |
| 4       | Support for construction of rearing house | 0              | 25      | 0              | 0               | 25 | 0              |
| 5       | Installment of hot air oven               | 0              | 25      | 0              | 0               | 25 | 0              |
| 6       | Establishment of reeling units            | 0              | 25      | 0              | 0               | 25 | 0              |
| 7       | Incentives on silk yarn                   | 0              | 25      | 0              | 0               | 25 | 0              |
| 8       | Health insurance                          | 0              | 25      | 0              | 0               | 25 | 0              |
| 9       | Schemes for women empowerment             | 10             | 15      | 40             | 5               | 20 | 20             |
| 10      | Tribal Sub-Plan (TSB)                     | 0              | 25      | 0              | 0               | 25 | 0              |

|    |  |   |    |   |   |    |   |
|----|--|---|----|---|---|----|---|
| 11 | Schedule Cast Sub-Plan (SCSB)                  | 0 | 25 | 0 | 0 | 25 | 0 |
| 12 | Mahatma Gandhi Rural Empowerment Guarantee Act | 0 | 25 | 0 | 0 | 25 | 0 |

**Table-6: Mass media exposure to the farmers**

| S. No.                                      | Particular | No. Of Farmers | Percentage |
|---|------------|----------------|------------|
| <b>• Exposure to T.V.</b>                   |            |                |            |
| a   | Regular    | 10             | 40         |
| b   | Occasional | 10             | 40         |
| c   | Never      | 05             |            |
| <b>• Radio</b>                              |            |                |            |
| a   | Regular    | 25             | 100        |
| b   | Occasional | 0              | 0          |
| c   | Never      | 0              | 0          |
| <b>• Newspaper</b>                          |            |                |            |
| a   | Regular    | 05             | 20         |
| b   | Occasional | 05             | 20         |
| c   | Never      | 15             | 60         |
| <b>• Agriculture based magazine</b>         |            |                |            |
| a   | Regular    | 0              | 0          |
| b   | Occasional | 0              | 0          |
| c   | Never      | 25             | 100        |
| <b>• Pamphlets</b>                          |            |                |            |
| a   | Regular    | 0              | 0          |
| b   | Occasional | 0              | 0          |
| c   | Never      | 25             | 100        |
| <b>• Interaction with scientists of KVK</b> |            |                |            |
| a   | Regular    | 0              | 0          |
| b   | Occasional | 10             | 40         |
| c   | Never      | 15             | 60         |
| <b>• Interaction with Extension Workers</b> |            |                |            |

|   |            |    |    |
|---|------------|----|----|
| A | Regular    | 0  | 0  |
| B | Occasional | 15 | 60 |
| C | Never      | 10 | 40 |

## Conclusion

The research provides guides for revitalizing silkworm cocoon production by helping sericulture extension. The most important effecting factor on revitalizing silkworm cocoon production and presenting technologies was effective training. The method of acquiring sericulture information had effect on effective training. So extension education programmes have vital roles to play in sericulture. Various research institutes including SKUAST- Jammu, SKUAST-Kashmir, CSRTI, Pampore, RSRS and CSB etc. were found to be actively engaged in overall development of sericulture by providing trainings on improved technology profits, cultivating mulberry varieties with high yield and appropriate hybrid of seasonal and regional silkworm. State Agriculture Universities i.e. SKUAST-Jammu and SKUAST-Kashmir, University of Jammu and University of Kashmir is also reported to participate on national platforms for promotion of sericulture across the UT of Jammu and Kashmir. Therefore, it is suggested that the extension functionaries should take adequate care and educate the farmers in adoption of improved technologies/practices to narrow down such yield gaps at different level. This would help not only to improve the farmers yield realization but also increase their income through sericulture in the long run.

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