

SERICULTURE IN JAMMU AND KASHMIR- A REVIEW

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ABSTRACT

Sericulture is considered as an age old occupation in Jammu and Kashmir. J&K has enormous potential for silk production empowering the farmers of J&K by increasing their income and employment (Dar *et al.*, 2021). The raw silk produced in J&K is recognized across the globe. The size of land holding is less for sericulture activity compared to horticulture and agroforestry. Farmers from about 20 districts of J&K take sericulture as the subsidiary occupation. Spring season crop (May-June) is the main crop in this region followed by second crop during September-October (Chouhan *et al.*, 2016). Important mulberry varieties cultivated are Goshwarami, Ichinose, KNG, Kukusou 21, Sujampur and Chak Majra (Shabnam *et al.*, 2016). Silkworm races of commercial importance are DUN22, NB4D2, SK6, SKUAST-31, CSR18 and DUN6 (Buhroo *et al.*, 2017). Sericulture is taken as a subsidiary occupation by about 33,000 rural households in J&K. Most of these families are economically backward and sericulture plays a crucial role for their livelihood. In order to empower these farm families productivity and quality of cocoons need to be improved by applying scientific package of practices. (Bhat *et al.*, 2020). Inadequacy of mulberry leaves and lack of awareness on scientific technologies, ineffective marketing strategies are the hurdles for the progress of sericulture industry in J&K.

Keywords: Sericulture, Scientific-technologies, Rearing, Marketing, Hurdles, Strategies.

INTRODUCTION

Sericulture is one of the oldest agro-based industries in the world, which suits to rural-based farmers, entrepreneurs, and artisans and require of low investment. It has high potential for higher returns (Ganie *et al.*, 2012) and play vital role in improvement of rural economy in India. Recently adoption and implementation of new ideas by research institutions in mulberry cultivation and silkworm rearing, the industry is now practiced as a main profession. Due to favorable climatic conditions, mulberry is cultivated mainly in five states of India namely, Karnataka, Tamil Nadu, Andhra Pradesh, West Bengal, Assam and Jammu and Kashmir states. These states collectively account for 97 percent of the total area mulberry cultivation and 95 percent of raw silk production in the country. The bivoltine sericulture development has been one of the priority sectors of Indian silk industry but its production is yet to meet the targets. In Jammu and Kashmir sericulture is practiced in 20 districts. The major silk production districts are Anantnag, Kupwara, Pulwama, Baramulla, Ganderbal,

Udhampur, Rajouri, Riasi and Kathua. It provides income and employment to the rural poor especially, farmers with small land-holding, marginalized and weaker sections of the society. Kashmir is a non-traditional sericulture state producing mulberry and tasar silk. Sericulture being one of the traditional industries in Kashmir, it's a land mark cultural heritage of Kashmir.

History of sericulture in Jammu and Kashmir

Sericulture as an enterprise has been playing a vital role in sustaining Jammu & Kashmir (J&K) state's economy. There is great deal of evidence in ancient Sanskrit literature that the original home of silk is Kashmir. Mirza Muhammad Haider in his, 'Tarikhi Rashide' has a mention of mulberry trees (cultivated for their leaves for production of silk) as among the wonders of Kashmir. The great king of Kashmir Sultan Zain-ul Abideen who is maker of industrial Kashmir gave special attention to this industry by introducing better techniques. Official reports reveal

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that Europe was the first continent with which Kashmir had started its silk trade. The reports show that in the year 1855, Kashmir was in a position to supply 250,000 dfls of silkworm seeds to Europe. By exporting silkworm seeds to Europe, the silk industry of Kashmir gained a pivotal position on the silk route of Europe (Baqual, 1995). When the history of sericulture in Jammu & Kashmir state is traced, it's seen that the silk industry was demonopolised in 1988. About 33,000 farming families produce around

1022MT of cocoons worth Rs.5.50 crore. An increase to around 1,500 MT is planned in the next decade. Constraints faced and remedial measures suggested are discussed, beginning with the mono cropping pattern. Productivity and quality need to be improved through better packages of mulberry cultivation and silkworm rearing and high yielding as well as superior quality silkworm breeds Figure 1.



Mulberry field



Cocoons



Rearing house



Silkworm rearing



Zain ul Abideen



Silk



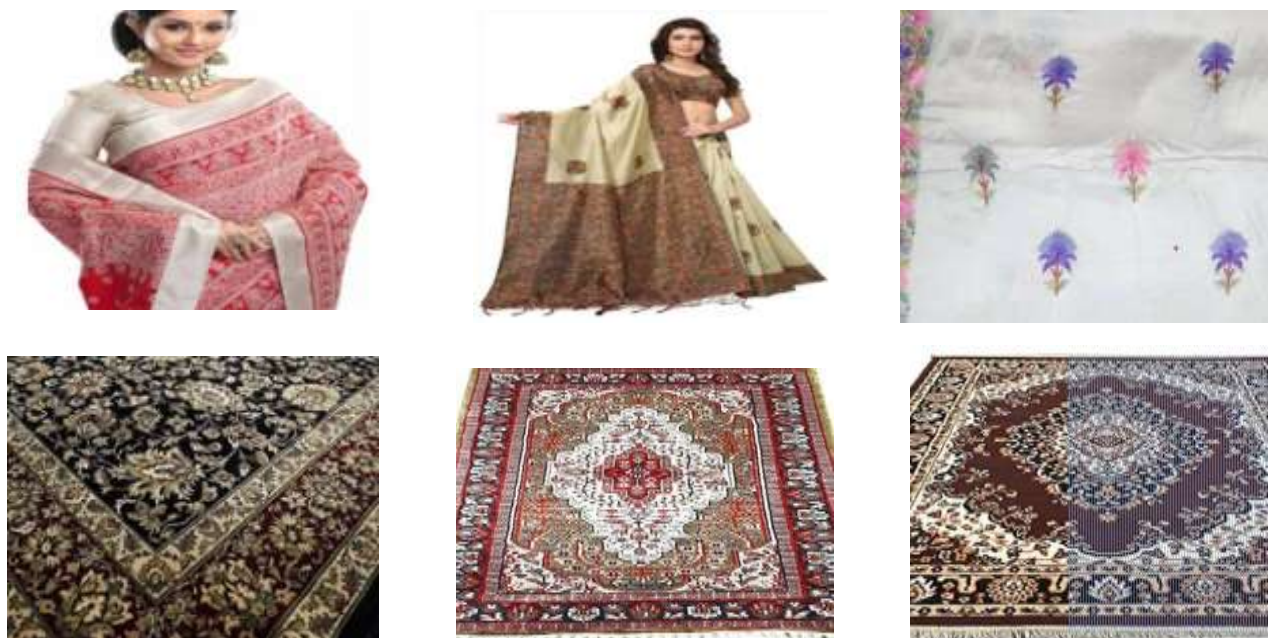
Figure 1. Sericulture Map of Jammu and Kashmir

In Jammu and Kashmir (J & K) sericulture is practiced in 20 districts. The major silk production districts are Anantnag, Kupwara, Pulwama, Baramula, Gandarbal, Udhampur, Rajouri, Riasi and Kathua. The details are presented in Fig. J & K is producing bivoltine silk of high quality comparable to international quality helps in improving the economic condition of the sericulture farmer and weaker sections of the society. It is providing high scope of employment opportunities in pre and post cocoon activities. Observing the strength of sericulture in J & K Japanese Scientist Dr. Tazima quoted '*Kashmir in view of its favorable climatic conditions could be converted into silkworm gene bank for sustaining the sericulture of the whole world*'. Presently about 30,000 rural families are generating income of Rs. 2026.00 lakh annually. 3.5 lakh mandays (3.0 lakh on-farm and 0.50 lakh in off-farm) activities are associated in this profession (Economic survey, J & K, 2014-15). With the increased economic needs due to changing social status and unpredictable market trends of different kinds of produces by the farmer to the state, sericulture has assumed special significance as an important subsidiary occupation which supplements the income of the farmers in additions to their returns from the

other crops.

Bivoltine Silk products in Jammu and Kashmir (Rs)

All the stages of mulberry sericulture from cultivation of mulberry plants, silkworm rearing to silk reeling and other post cocoon processes such as twisting, dyeing, weaving, printing and finishing are labour-intensive. For economically evolving the cost of cocoon production at farmers level in Kashmir valley three case studies were carried out during 2015-16, 2016-17, 2017-18, in Dachnipora cluster (Anantnag district) involving 100 farmers each. These farmers were selected randomly out of 500 farmers from captive area of Dachnipora under supervision of Central Silk Board. While calculating the costs, the different cost items were grouped under fixed and variable cost. The data on fixed and variable cost items was analyzed by using simple tabular methods. The results showed that during 2015-16, cost for production of one kg dry cocoons was ₹ 489, during 2016-17 cost for production of one kg dry cocoons was ₹ 458.2, while as during 2017-18 the cost was ₹ 534/kg dry cocoons.



Role of Jammu and Kashmir in Bivoltine Sericulture

Jammu and Kashmir is the only state of the country which is at the same altitude in which leading bivoltine sericulture countries in the world lies. It is having climate edge over the other sericulture states of the country in production of bivoltine silk. J & K is producing bivoltine silk of high quality comparable to international quality helps in improving the economic condition of the sericulture farmer and weaker sections of the society. It is providing high scope of employment opportunities in pre and post cocoon

activities. Observing the strength of sericulture in J & K Japanese Scientist Dr. Tazima quoted '*Kashmir in view of its favorable climatic conditions could be converted into silkworm gene bank for sustaining the sericulture of the whole world*'. An analysis of trends in international silk production suggests that sericulture has better prospects for growth in the developing countries rather than in the advanced countries. Currently, the domestic demand for silk is high than what is getting produced in the country and the rest being imported mainly from China. The production of quality Bi-voltine silk is still a challenge. The J&k state,

having enormous potential to produce bivoltine silk of international grade, can help to reduce the import of Bivoltine silk in the country.

Sericulture in Jammu and Kashmir

In Jammu and Kashmir UT, sericulture holds a special place. This is India's only conventional Univoltine belt capable of processing silk with qualities equal to the finest imported raw silk of standard quality available on foreign markets. J&K state is known for producing bivoltine silk of international quality. The industry provides part time employment to about entrepreneur 30,000 families by way

of silk worms rearing, besides providing employment to 5,000 persons on regular basis in the public sector. Silk industry generates employment to about 10,000 weavers on the full time basis, in about 2,000 units in the valley in private sector. Thus about 2.15 Lakh people are engaged on full time or part time in this industry. The silk industry was a state monopoly till 1988 and farmers were getting no benefit out of the sale of cocoons as per floor price fixed by the government. A deep thought was given to regain its lost glory. The industry was de-monopolised and ownership of plant was transferred to the farmers with the permission to sell surplus leaves and earn money.



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Initiatives taken by the state Government for promotion of sericulture in J&K

The J & K state has taken many new initiatives for promotion of sericulture. Some of the initiatives are enumerated as-

1. Implementation of scheme 'Health Insurance for women' which aims at providing insurance cover to the women engaged in silkworm rearing. 2500 women rearers were brought under this scheme during 2012 - 13.
2. Implementation of scheme 'Marketing support to cocoon growers' Rs. 32.10 lakh has been paid to cocoon growers as marketing support on account of low prices fetched by

them.

3.Implementation of scheme ‘Cluster Development Programme’ 25 clusters are operational in the state under holistic approach for development of sericulture in the state.

4.Implementation of scheme ‘Cluster Plantation’ to augment area under mulberry plantation through farmers and on govt. land during the year 2012-13, 11.00 lakh plants (8.00 lakh plants through farmers and 3.00 lakh departmentally) were planted under the scheme ‘support for raising of mulberry plantation’ and similar no. of mulberry plants are being planted during financial year 2013-14 with enhanced unit cost of Rs. 5500 / 300 plants.

5. Implementation of scheme ‘Supply of Rearing Kit’ under catalytic development programme during the year 2012-13, 2000 silkworm rearers were provided with rearing kit under transfer of technology at a unit cost of Rs, 0.25 lakh under CDP and 1600 more beneficiaries are being covered during year 2013-14.

6. Implementation of scheme ‘Technological advancement scheme’ 20 number hot air dryer at a unit cost of Rs. 1.75 lakh were established in the state to facilitated cocoon drying by farmers on scientific lines by way of shifting the process from the conventional sun drying. This has helped farmers to fetch better prices for their produce.

Raw Silk Production in India

Mulberry foliage is the only food for the silkworm (*Bombyx mori* L.) and is grown under varied climatic conditions ranging from temperate to tropical. Mulberry leaf is a major economic component in mulberry silk production since the quality and quantity of leaf produced per unit area has a direct bearing on cocoon harvest. In India, most states have taken up mulberry silk production as an important agro-industry with excellent results. The total acreage of mulberry in India is around 282,244 ha. The details of the area under mulberry cultivation in different states and UT’s in India are shown in the table.

Years	Mulberry	Tasar	Eri	Muga	Total (MT)
2014-15	21,390	2,434	4,726	158	28,708
2015-16	20,478	2,819	5,060	166	28,523
2016-17	21,273	3,268	5,637	170	30,348
2017-18	22,066	2,988	6,661	192	31,906
2018-19	25,344	2,981	6,910	233	35,468
2019-20	25,239	3,136	7,204	241	35,820
2020-21	23,896	2,689	6,946	239	33,770

Salient Features of the sector

I) The prevailing climate and availability of skilled labour in the valley of Kashmir are the favorable factors existing for silk production.

II) There are 2,800 villages and 33,000 households which have taken up sericulture as an important economic activity.

III) For the development of healthy silk, two basic seed stations have been established at Udampur and Mirgund.

IV) In the state, there are about 7 lakh mulberry trees, out of which 53 per cent (370,000) are in Jammu division and 47 per cent in Kashmir division. Work on the Qazigund Nursery is also under progress.

V) Annually, about 1022 MT of cocoon are produced generating an income of about Rs. 2224 lakh for these silkworm rearers coupled with the annual employment generation to the tune of 3.5 lakh mandays (3.0 lakh on-farm and 0.50 lakh off-farm).

VI) The department has 173 mulberry nurseries spread over an area of 963 acres, and 374 mulberry blocks over an area of 2215 acres across the state of Jammu and Kashmir.

VII) Annually, about 668 tones of raw silk is produced

which is approximately worth Rs. 50 crores or 50 million.

VIII) The department has 219 no’s of mulberry farms spread over an area of 917 acres, having mulberry tree population of 9.33 lakh helping landless people.

IX) The department has 10 basic seed stations & 17 grainages producing about 1,700,000 dfls of silkworm seed.

X) The state has well established cocoon bank facility, with a revolving fund of Rs.100 lakhs for reelers to run their units throughout the year.

Mulberry Silk Scenario in India

The Indian sericulture market was worth INR 241.1 Billion in 2018. The market is further projected to reach a value of INR 637.7 Billion by 2024, growing at a CAGR of 17.6% during 2019-2024. India is currently the world’s second-largest producer of raw silk and the largest consumer of raw silk and silk fabrics. Mulberry foliage is the only food for the silkworm (*Bombyx mori*) and is grown under varied climatic conditions ranging from temperate to tropical. Mulberry leaf is a major economic component in mulberry silk production since the quality and quantity of leaf produced per unit area has a direct bearing on cocoon harvest. In India, most states have taken up mulberry silk

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S. No	State	Area (ha)
1	Andhra Pradesh	38,084
2	Assam	2,813
3	Jammu and Kashmir	4,717
4	Karnataka	1,66,000
5	Kerala	1,164
6	Madhya Pradesh	2,043
7	Manipur	25,975
8	Tamil Nadu	9,491
9	Uttar Pradesh	5,665
10	West Bengal	21,358
11	Other	4,934
	Total	2,82,244

Area under mulberry (ha)



Jammu and Kashmir Mulberry Silk Scenario

Jammu and Kashmir enjoy the best climate for Bivoltine silkworm rearing with Kashmir valley being very congenial for Bivoltine cocoon production, which is ideal for producing international grade silks of 3A and above; which is majorly required by power looms and export-oriented units. Out of the total Mulberry Silk production in the country, the Bivoltine silk production constitutes only 16%, while rest of the mulberry silk production is Multivoltine in nature which is relatively inferior in yield and quality in comparison to Bivoltine silk. Currently, Sericulture is a subsidiary source of income which is practiced by about

27000 families in all the Districts of the newly created Union Territory of Jammu and Kashmir. Majority of these families belong to economically weaker sections of the society such as Schedule castes, Scheduled Tribes, landless and other low-income rural people with majority of women folk. Udhampur, Rajouri, Kathua, Anantnag, Bandipore, Baramulla and Kupwara are the major Cocoon producing districts. The UT produced about 800 MT of cocoons during 2018-19 with income generation of about Rs 25.00 crore under pre-cocoon sector and an estimated Rs crore under post- cocoon/yarn production excluding value additions in silken fabric/products sales.

Year	Cocoon Production (MT)	Income Generation (Lac Rs.)	Average Price of cocoons/Kg	Productivity Per Oz (Kg)	Silkworm Rearers
2008-09	738	455.67	192.00	32.00	19700
2009-10	810	800.00	300.00	35.00	22800

2010-11	860	1100.00	410.00	35.00	25500
2011-12	917	963.00	350.00	37.00	27000
2012-13	901	1193.00	397.00	37.00	28000
2013-14	1022	2026.00	630.00	39.00	29390
2014-15	1032	1907.00	625.00	37.00	30894
2015-16	944	2020.00	650.00	37.00	30894
2016-17	973	2200.00	700.00	38.00	27115
2017-18	1084	2110.00	750.00	38.00	-
2018-19	990	2300.00	800.00	39.00	-
2019-20	950	2250.00	850.00	42.00	-

Opportunities

I) India imports about 4000 MT of raw silk from China to cater its power looms – Jammu and Kashmir as a unique bivoltine UT can fill this gap and can become a leading silk producing UT.

II) Sericulture involves a number of processes right from mulberry plantation through silkworm rearing, reeling, weaving and marketing and thus engaging large number of people including women. Once promoted on a larger scale with value addition, sericulture has the potential to provide gainful employment to lacs of people of the UT.

III) There is a vast scope of technology adoption, capacity building of the cultivators and implementation of global best practices.

IV) 70% cocoon crop produced in the UT is sold to people from outside the UT. Establishment of adequate silk reeling facilities and infrastructure related to forward linkages will add tremendous value to the existing value.

Support from Central Silk Board for development of sericulture

CSB is providing all support for development of sericulture. With the primary aim of the Institute to boost and revitalized the silk industry of J & K, CSR & TI, Pampore with its nested units provide need based Research Development / Extension and HRD support to the state and north-west states of the country. The Institute has implemented a number of research programmes, which led to the development of region / season specific technologies resulting in increased productivity levels. Based on the ground realities, the Institute after consulting the active players engaged in Development of Silk Sector developed a 'Model' suitable for development of silk industry. Under bivoltine production programme, CSB has established 25 cluster in J & K. The Institute as a part of national responsibility maintains a rich germplasm of 168 silkworm races and 80 mulberry genotypes of temperate origin for conservation and utilization.



Strategies suggested for development of sericulture in J & K

Following strategies are suggested for development of sericulture in J & K –

1. Introduction and development of region and season specific silkworm races and mulberry varieties.
2. Increase in area under mulberry cultivation through large scale plantation of improved mulberry cultivars.
3. Promotion of mulberry sericulture enterprise in hilly / border and backward areas.
4. Promote mechanization and rationalization in the field of mulberry cultivation, silkworm rearing and silk reeling to bring down the cost of raw silk.
5. Give sufficient research focus in breeding to obtain suitable bivoltine races.
6. Enhance economic viability of reeling activity through effective utilization of by products.
7. Apply eco-friendly integrated nutrient / disease and pest management strategies both for mulberry and silkworm.
8. Contribution of women in sericulture development needs to be recognized.
9. Middle level functionaries and technicians should be trained.
10. Massive training to farmers on the basis of result demonstration, farm field school, printing of literature etc.
11. Study tours / farmer's tours to research institutions

and advance sericulture states should be organized regularly.

12. Assistance to seri enterprises / seri graduates to set up seri clinics / seri business centers.
13. Proper and timely marketing facilities.
14. Concentration of efforts on small and marginal farmers.
15. Joint efforts of researches, extension specialists, and farmers to test and modify improved sericulture technologies appropriate for local conditions.
16. Development of sericulture under NREGA.

Popular Mulberry Genotypes found in Jammu and Kashmir

Survey reports available on the mulberry wealth in J & K were taken up and the information was collected on the availability of some commercial as well as local/wild mulberry genotypes (Bindroo *et al.* 2005). Based on this information, mulberry genotypes were classified on the basis of their species and percentage (%) of occurrence of these species was worked out. Jammu and Kashmir province CSR&TI, Pampore has a mandate to conserve and evaluate temperate mulberry germplasm bank. As many as 80 mulberry genotypes of exotic and indigenous origin are available in the temperate germplasm bank. A wide spectrum of activities ranging from acquisition, characterization, conservation and evaluation of useful traits with mulberry germplasm involving 70 genotypes has been done (Dhar *et al.* 2011).

Mulberry varieties in temperate sericulture zone

Variety	Species	Percent occurrence	Trees (lakh)
Goshoerami	<i>M. multicaulis</i>	40.30	14.105
Ichinose	<i>Morus alba</i>	15.40	5.39
KNG	<i>Morus alba</i>	14.70	5.145
Chattatul	<i>Morus alba</i>	10.20	3.57
Kokusou	<i>Morus alba</i>	6.60	2.31
Rokokuyaso	<i>M. multicaulis</i>	4.80	1.68
Zagtul/Botatul	<i>Morus alba</i>	3.60	1.26
Chinese white	<i>Morus alba</i>	3.10	1.085
Others	<i>Morus indica</i>	1.30	0.455
Total		100 .00	35.00

Mulberry varieties in subtropical sericulture zone

Variety	Species	Percent occurrence	Trees (lakh)
Sujanpur (local)	<i>Morus indica</i>	34.00	2.72
Chak Majra	<i>Morus alba</i>	19.30	1.54
Kanva-2	<i>Morus alba</i>	20.00	1.60
Chinese white	<i>Morus alba</i>	11.70	0.94
S-146	<i>Morus alba</i>	9.50	0.76
S-41	<i>Morus alba</i>	1.90	0.15
S-1 (Mandalay)	<i>Morus alba</i>	1.60	0.13
Berhampur	<i>Morus alba</i>	1.00	0.08
Tr-10	<i>Morus alba</i>	1.00	0.08
Total		100.00	8.00



Mulberry germplasm bank COTS Mirgund



Plate 1: Varieties of *Morus alba* in North Kashmir

Popular silkworm genotypes found in Jammu and Kashmir

Twelve potential bivoltine silkworm *Bombyx mori* L. genotypes were evaluated for their performance at 25 ± 1 °C temperature and 75 ± 5 % relative humidity for twelve different traits during spring and summer seasons of 2012 and 2013, respectively. The data generated in respect of different traits was pooled separately, analyzed statistically and subjected to multiple trait evaluation indexes. The genotypes were ranked as per the cumulative score and the

value of a particular trait in a particular genotype was compared with the ranking. Out of twelve genotypes, six genotypes viz., SKAU-R-1, SKAU-R-6, SKUAST-31, NB4D2, SH6 and SKUAST-28 were shortlisted for spring season and eight genotypes viz., SKAU-R-1, SKAU-R-6, NB4D2, SH6, SKUAST-31, CSR18, DUN6 and DUN22 for summer season. These genotypes scored higher E I values (>50) and were identified as promising genotypes hence recommended for rearing under temperate climatic conditions to push up silk productivity in the valley.

Furthermore, the genotypes viz., SKAU-R-1, SKAU-R-6, SKUAST- 31, NB4D2, SH6, and DUN6 performed significantly better irrespective of the seasons and

scored higher E I. values (>50). Hence, these genotypes can be recommended for both seasons to boost bivoltine silk production in temperate region.



DUN22 Larva



Cocoons



NB4D2 Larva



cocoons



SK6 Larva



SK6 Cocoon

Problems of Sericulture in J & K state

- I. Silkworm seeds are distributed more than the requirement, which lead to leaf shortage in the later stages of rearing.
- II. Farmers conduct rearing in dwelling houses without proper ventilation and do not have separate rearing houses.
- III. Farmers are reluctant to disinfect their houses properly as they themselves live in the same houses.
- IV. Unhygienic methods of rearing leading to disease outbreak.

- V. Most of the farmers are supplied incubated seed only and not the chawkie worms.
- VI. Farmers use neither stands nor trays for rearing silkworms and rear them either on floors or temporary shelves under crowded conditions.
- VII. Poor quality of mulberry leaf leading to prolonged larval life.
- VIII. Mono-cropping and low leaf production from age old plants of inferior genetic stock.
- IX. Spinning of cocoons is not done properly and sun drying of cocoons is very common affecting the reliability and quality of silk.

X. Due to these defects, farmers are unable to get remunerative price for their cocoons.

XI. Weak sericulture extension mechanism.

XII. Marketing facilities are not adequate.



Silkworm seed



Mulberry plants without leaf



Without proper ventilation



Floor rearing



Shelves rearing



Leaf chopping direct sunlight



Sun drying cocoons



Cocoon harvesting

Integrative Approach in Mulberry Cultivation- An Answer to Leaf Shortage at Farmers' Level in Kashmir

Sericulture is a traditional agro-industry in Jammu & Kashmir state but the production of silk declined during the last decade because of stiff competition with other horticultural and agricultural crops. Though an easy, less time consuming but a good revenue generating activity the number of farmers showed a marked decrease because of many reasons and one important reason among them being the non availability of quality mulberry leaf with the farmers. Under Kashmir conditions, mulberry is grown in a scattered manner on farm boundaries, river bunds, and road

sides and the plant does not get much attention as far as the nutrient application and other cultural activities are concerned. Mulberry in Kashmir remains dormant during the winter. The winter buds start sprouting from 4th week of March onwards. The leaves increase in size gradually and are fed to silkworm during May- June, i.e. spring crop, which is the main crop in this region. This is followed by pruning of the shoots right from the crown base during 2nd week of June. The buds sprout again and shoots attain a very good height up to the end of September besides bearing luxuriant leaf. The leaf is either plucked again to feed the livestock animals and silkworm (2nd Crop) or is

left as such to undergo senescence and natural fall during November. The plants remain dormant and bereft of any leaf up to March next.

Why this industry still survives in J&K

Sericulture productivity whether high or low supports many families and provides them livelihood that is not easily available in places where they live. Secondly Govt. also raised the price of cocoons coupled with improvement in reeling sector. Some of the initiatives taken by the Govt. like Cluster Promotion Programme, Marketing support to cocoon growers, Catalytic Development Programme, Enhancement in floor price of cocoons etc are considered as encouraging steps.

Innate vitality

I) Another economically important factor of Kashmir sericulture is the inherent vitality of the industry. Kashmir sericulture though crippled and faltered in times but in never succumbed completely. This shows the inherent vitality of the industry.

II) It has taken up deep roots within the Kashmir society and traditions and what it needs is modernisation in every phase.

III) Kashmir silk is much in demand abroad and within India despite higher prices and comparative inferior quality because of its traditional exquisite design and intricate craftman ship.

Steps to be taken for revival and boosting of silk industry in J & K

Enrich the Mulberry wealth in Jammu and Kashmir by carrying out massive plantation drives.

- Strengthen the rearing Infrastructure.
- Facilitate Transfer of Technology for silkworm rearing and cocoon production.
- Ensure capacity building and enhancement of skills of the rearers and field functionaries through effective training programs.
- Promote women participation in sericulture activities.
- Create a thriving post-cocoon sector in the UT.
- Introduce sericulture in unexplored areas (Dar, *et al.*, 2020).
- Promote intercropping of various crops with mulberry plantation.
- Introduce sericulture as a component in integrated Farming.
- Create a thriving post-cocoon sector in the UT.
- Introduce sericulture in unexplored areas (Dar, *et al.*, 2020)
- Promote intercropping of various crops with mulberry plantation.
- Introduce sericulture as a component in integrated Farming.

Future Priorities for J & K

Focused approach to evolve region / season specific cost effective technologies with the main aim to address the constraints and improve the production / productivity. Development of appropriate package of practices for constant up gradation of productivity of mulberry and silkworm races. Undertake programme to promote and develop participatory approach for effective adoption of technologies by the users and encourage such ideas through 'Cluster Approach' by establishing Cluster Development Centers in potential areas and encourage implementation through SHGs, NGOs, or Co-operative Societies, etc. To conduct research in identified priority areas viz. soil science, disease forecasting and forewarning and establishment of farmers field schools. With the help of meteorological data and bionomical studies strengthen the pest and disease forecasting and forewarning system in order to provide timely messages to the farming community for undertaking effective advocated /needed measures to minimize the crop loss. Emphasis on up gradation of knowledge and skill of the development/extension workers and farmers through need based training programmes.

CONCLUSION

Bivoltine sericulture is on the top priority for the Indian sericulture industry. J&K has huge potential for the production of bivoltine silk. More importance to horticulture and agriculture crops (Apple, walnuts tree, paddy, grapes etc). Only two crops in a year. Not following scientific technologies. No proper marketing system. In Jammu and Kashmir sericulture is an ideal enterprise for the rural development especially for the weaker section of the society. Even now, rearing cum dwelling is seen in few district. Awareness programme.

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