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Proceedings of National Conference on
**Corporate Governance and
Sustainable Competitiveness in
Agriculture Collectives**
(Cooperatives & Farmer Producers' Organisation)

15th – 17th December 2021 (Virtual mode)



EDITORS

Hema Yadav

Manisha Paliwal

Sagar Wadkar

Organized by

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Fostering Cooperative Entrepreneurship in Sericulture Sector: Scoping Study from Cocoon Growers Perspectives in Jammu and Kashmir

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Abstract

Sericulture has been recognized as key livelihood activities for millions of marginal and small farmers in India. The present paper is an attempt to analyse the status of sericulture in Jammu and Kashmir. Sericulture is being practiced in 20 districts and 80% of the state's total cocoon production is from seven districts viz. Rajouri, Udhampur, Kathua, Anantnag, Kupwara, Baramulla and Pulwama, which contributes 65% to the total raw silk produced in North India. The study aimed to explore the key stakeholders involved in the sericulture, supply & value chain and scoping for the cooperative – Farmer Producers Organizations (FPOs). The study follows the descriptive research design. The data was collected through both primary and secondary sources. The primary data collected through face-to-face interaction with farmers through semi-structured interview schedule and Focus Group Discussions (FGDs) were made with purposively selected 150 sericulture farmers across six districts of Jammu and Kashmir. The secondary data was collected from Central Silk Board and State Sericulture Department. Jammu and Kashmir ranks 16th in overall raw silk production and is a leading state in case of bivoltine silk production in the North India. The study found that majority of the respondents (63.50%) were belongs to old age (58-75 years) category, 29 per cent respondents possess education upto high school level, 74.66 per cent had less than one ha land size and 35.33 per cent belonged to lower income category. The major stakeholders in sericulture industry are the cocoon producers, grainures, reelers, weavers, which works in isolation and thereby failed to develop end-end to silk value chain. The authors suggest that cooperative form of producers" organisations can play a major role in growth and development of sericulture in the State. It demands multi-institutional partnership to create win-win situation for all the key stakeholders including cocoon/ silk growers.

Keywords: Central Silk Board, Cooperative Farmer Producers' Organization (FPO), Reelers, Sericulture, Silk Supply and Value Chain, Weavers

1. INTRODUCTION

Indian textiles and apparel industry is one of the largest in the world having unmatched raw material and manufacturing base across the value chain. It is the second largest producer of Fibre after China. India is the sixth largest exporter of Textiles & Apparel in the world.

India's textiles and clothing industry is one of the mainstays of the national economy. The share of textile and apparel (T&A) including handicrafts in India's total exports stands at a significant 11.8% in 2019- 20. India has a share of 5% of the global trade in

textiles and apparel (MoT, 2020-21). The textiles and apparel industry contributes two per cent to the Nation's GDP, and 12 per cent to export earnings and held five per cent of the global trade in textiles and apparel in 2018-19. The share of the India's textiles and apparel exports in mercantile shipments was 11% in 2019-20 (IBEF, 2021).

The uniqueness of the industry lies in its strength both in the hand-woven sector as well as in the capital intensive mill sector. The mill sector is the second largest in the world. Traditional sectors like handloom, handicrafts and small scale power-loom units are the biggest source of employment for millions of people in rural and semi urban area, generating high employment and income per unit area of land. It provides direct employment of over 45 million people and source of livelihood for over 100 million people indirectly, including a large number of women and rural population. As estimated by Central Silk Board (CSB) sericulture can generate employment of 11 man days per kg of raw silk production (in on-farm and off-farm activities) throughout the year. This shows the employment generation potential in rural areas and can act as a tool for rural transformation. Thus, the sector has perfect alignment with Government's key initiatives of Make in India, Skill India, Women Empowerment and Rural Youth Employment.

Sericulture as part of the Textile Industry has indirect effect on the farm income, about 25 per cent. Sericulture is practiced in about 52,360 villages all over the country and employment to about 7.56 million people, most of them being small and marginal farmers in rural areas, creating employment to at least for 12-13 people per hectare of *Mulberry* cultivation (Dewangan, 2017).

India is the only country produces all the five known commercial silks, namely, mulberry, tropical tasar, oak tasar, eri and muga, of which muga with its golden yellow glitter is unique and prerogative of India. Out of these five types of silks, mulberry sericulture is mainly practised in states like, Karnataka, Andhra Pradesh, Assam and Bodoland, West Bengal, Jharkhand and Tamil Nadu and other four varieties of silk viz., Mulberry, Oak Tasar, Muga and Eri are being practiced in North Eastern States (NES). Overall NES contributes 18% of India's total silk production.

India with the production of 35,820 MTs of silk is the second largest producer of silk in the world after China. Among the four varieties of silk produced, Mulberry accounted for 70.46% (25,239 MT), Tasar 8.76% (3,136 MT), Eri 20.11% (7,204 MT) and Muga 0.67% (241 MT) of the total raw silk production of 35,820 MT. The import substitute Bivoltine silk production has increased from 6,987 MT in 2018-19 to 7,009 MT in 2019-20 registering a marginal increase of 0.32% growth. Vanya silk (Tasar, Eri, Muga) production has increased from 10,124 MT to 10,581 MT showing an increase of 4.51%. Muga silk has recorded the highest ever production of 241 MT (MoT, 2020-21).

1.1 HISTORICAL PERSPECTIVE

Indian sericulture is an ancient industry dating back to several centuries. Severe competition from Chinese and Japanese silk during 1931-32 affected the Indian silk industry and there was no effort by the then Imperial Government. The Laffroy

Committee (1914-15) recommended the need for an organization backed by the Government to look after development need of sericulture Industry in India as the industry serves for overall development of weaker sections of the society. The committee also observed that the silk industry was largely in hands of middlemen's, traders. During the Second World War (1939 - 45), the silk industry got boost with the stoppage of supplies of raw silk from China and Japan. Eventually, first time the sericulture industry received a financial assistance from the Government for expansion of the industry and thereby the raw silk production was increased from 691 MT in 1938 to 1242 MT in 1949.

Sericulture in India has proved to be an ideal avocation for inclusive development of rural populace especially the weaker sections of the society addressing equity distribution from urban rich to rural poor. With its eco-friendly production process and high potentialities became an ideal tool for biotechnological development, and a way for women and tribal empowerment. Sericulture stands for livelihood opportunity for millions owing to its high employment potential, low capital requirement and remunerative nature. India being the second largest silk producing country in the World, next to China, provides employment to millions of people in the entire silk production value chain from *farm to fabric*.

In order to give further impetus to the sector, on 21st March 2018, the Cabinet Committee on Economic Affairs (CCEA), chaired by Hon'ble Prime Minister of India, has approved an Integrated Scheme for Development of Silk Industry (ISDSI) titled as *-Silk Samagra* for implementation during 2017-18 to 2019-20. It has four major components *viz.*, (1) R&D, ToT, Training & IT initiatives (2) Seed Organizations (3) Coordination and Market Development and (4) Quality Certification System.

National Silk Policy (NSP) 2020 has included sericulture as agriculture allied activity under Remunerative Approach for Agriculture and Allied sector Rejuvenation (RAFTAAR), previously Rashtriya Krishi Vikas Yojana (RKVY). This enables the sericulturists to avail the benefits of the scheme for the entire sericulture activities up to reeling. The CSB (Amendment) Act, Rules and Regulations have been notified by the Government of India to bring quality standards in silkworm seed production. Forest Conservation Act has been amended to treat non-mulberry sericulture as forest based activity enabling the farmers to undertake 'Vanya silkworm' rearing in the natural host plantation in the forests. Antidumping duty on Chinese raw silk - The Director General of Antidumping & Allied Duties (DGAD), New Delhi has recommended imposition of antidumping duty on Chinese raw silk of 3A Grade & Below in the form of fixed duty of US\$ 1.85 per Kg on the landed cost of imported raw silk vide notification No.14/17/2014/DGAD dated 4-12-2015. Catalytic Development Programme (CDP) and Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) convergence guideline have been finalized and issued jointly by the Ministry of Textile and Ministry of Rural Development. These guidelines will help sericulture farmers to avail assistance from MGNREGA scheme.

1.2 STATUS OF SERICULTURE IN INDIA

It is interesting to note that sericulture and allied activity sector is the largest employer in the country, next to agriculture. Indian silk industry with about 1.2 million sericulturist families and 8.5 million people, involved in a host of activities accounting for over 20% share of textile sector has maintained its momentum in growth and sustainability, in spite of rapid industrialization and increasing pressure on arable land. Figure 1 shows the trends of silk production of mulberry, tasar, eri muga from 2000 to 2021. The Mulberry silk production is higher as compared to the other types of silk. Figure 2 shows the increasing trend of mulberry silk production in India.

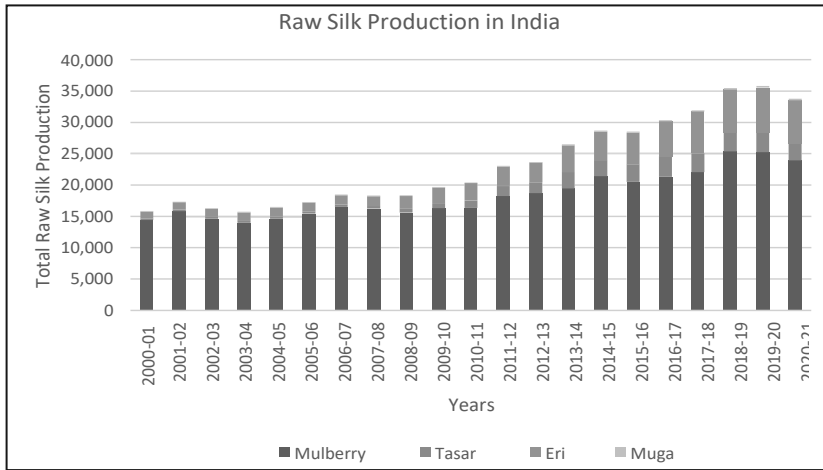
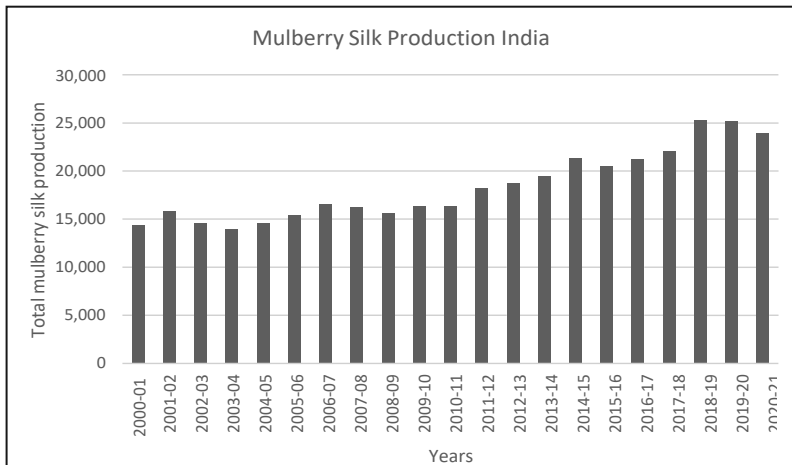


Fig. 1: Trend of Raw Silk Production (Source: MoT, 2021)



(Source: MoT, 2021)

Fig. 2: Trend of Mulberry Silk Production in India

There are 29 States in the country which have inherent strength of which, 26 States are important in sericulture either for mulberry, eri, muga & tasar or in combination of these sectors (Refer Table 1).

Table 1: State wise Mulberry Plantation Area and Raw Silk Production

State	Mulberry plantation (ha)	Raw silk production (MT)
Karnataka	106384.30	11142.60
Andhra Pradesh	44607.20	7961.50
Assam	2095.00	3897.00
Jharkhand	552.40	2401.70
West Bengal	15733.00	2294.70
Tamil Nādu	23268.00	2154.40
Bodoland	413.00	1418.20
Meghalaya	3289.00	1192.10
Nagaland	694.40	600.10
Manipur	3291.20	503.80
Chhattisgarh	242.40	479.90
Maharashtra	7154.00	427.60
Uttar Pradesh	3711.60	308.70
Telangana	4770.00	297.40
Odisha	457.20	137.20
Jammu and Kashmir	8183.00	117.00
Tripura	2064.00	110.50
Mizoram	1678.80	103.60
Arunachala Pradesh	278.00	64.00
Madhya Pradesh	2018.00	61.20
Bihar	598.00	55.90
Uttarakhand	3478.00	40.40
Himachal Pradesh	3183.00	31.00
Kerala	144.10	13.40
Punjab	1164.30	3.30
Sikkim	300.00	1.00
Haryana	213.00	0.80
All India	239965.00	35820.00

(Source: Central Silk Board Annual Report 2019-20)

It is clear from the Table 1 that Karnataka State is leading in the production of raw silk as well as mulberry plantation. Jammu and Kashmir comes 16th in overall raw silk production but it is a leading state in case of bivoltine silk production in the North India. It is further inferred from the table that despite maximum area under the Mulberry plantation in the States like West Bengal, Tamil Nadu, Maharashtra, Uttar Pradesh, Telangana, Jammu & Kashmir, Madhya Pradesh, Uttarakhand, and Himachal Pradesh, the raw silk production is minimal, which needs attention by Central & State government and other key stakeholders in order to increase the overall silk production in India.

1.3 INSTITUTIONAL ECOSYSTEM OF SERICULTURE INDUSTRY

As reported in the Seri-State Profile (2019), in view of the need for development of silk industry, the Government of India had set up a Silk Panel on 8th March, 1945 to examine the development of silk industry and suggest suitable measures. The Panel, while drawing up a 5- year Plan as a part of a prospective Plan of 15 years, suggested, setting up of the Central Silk Board (CSB) for ensuring coordinated development of the industry under Central Government Control. The Government of India accepted the recommendations of the *Silk Panel* and enacted the CSB Act 1948. Accordingly, the CSB was setup under an Act of Parliament (Act Number LXI of 1948) for shaping the sericulture industry on 9th April 1949 with its headquarters in Delhi under the Chairmanship of Shri Syama Prasad Mukherji, Minister for Industry and Supply, Government of India.

Eventually other sericulture research stations like Central Sericulture Research Station (CSRS), Berhampore, West Bengal, which was established by the Imperial Government of India in 1943 under Council of Scientific and Industrial Research (CSIR) and the CSRS, Mysore under Mysore Province, were brought under the control of CSB, Government of India for overall growth of the industry.

In 1958, CSB established Central Silkworm Seed Station in Jammu & Kashmir and in 1961, the Board took over Parental Seed Station, Coonoor from the then Madras Government. In 1964, Board established ‘Central Tasar Research and Training Institute’ (CTRTI) at Ranchi and three Regional Offices at Delhi, Kolkata and Bangalore. During 1970 the Board established Regional Sericulture Research Stations (RSRS) and Research Extension Centres (REC) based on the recommendations of All India Sericulture Coordination Committee headed by eminent Scientists like Dr. M.S. Swaminathan and Dr. V.L. Chopra, the then DG, Indian Council of Agricultural Research (ICAR). Subsequently, Central Silk Technological Research Institute (CSTRI), Bangalore, Central Eri and Muga Research Station (CEMRS), Jorhat with a network of RECs were established with the approval of the Government of India as a part of Central Sector Scheme.

During 1980, the CSB organized Silkworm Seed Organizations for mulberry, tasar, eri and muga. Under the World Bank-assisted-National Sericulture Project, wherein

CSB established specialized research institutes *viz.* Central Sericultural Germ Plasm Resource Centre, Silkworm Seed Technological Laboratory and Seri-Biotech Laboratory during 1990. Figure 3 highlights the administrative set-up for operational management of the sericulture sector.

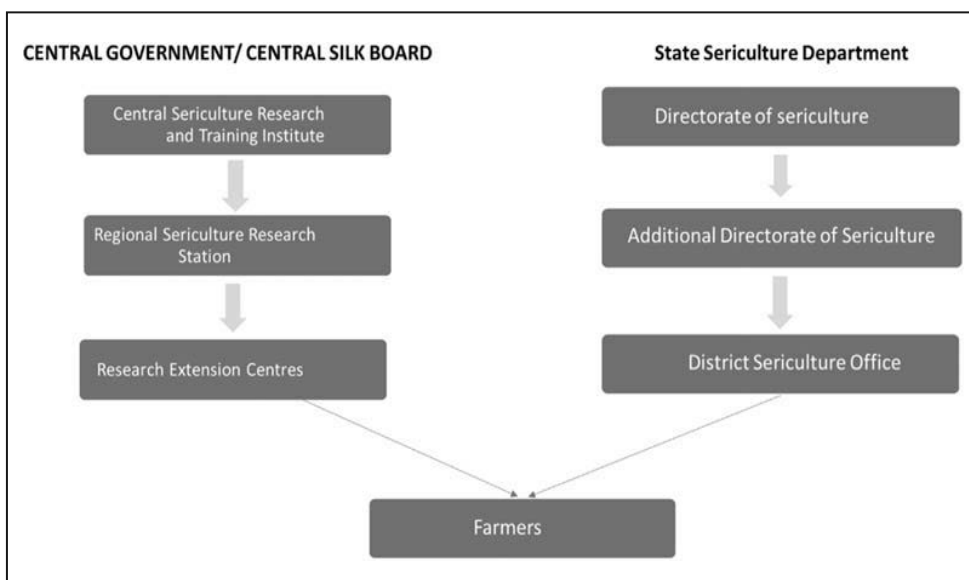


Fig. 3: Administrative Set-up of Sericulture Sector

As per the Handloom Census (2009-10), there are 23.77 lakh handlooms in the country, providing employment to 43.31 lakh handloom weavers and workers. This includes 38.46 lakh adult handloom weavers and workers. Out of the total adult handloom weavers and workers, 24.71 lakh are full time and 13.74 lakh are part time. In J&K, there are approximately 38,000 handlooms, 523 registered Handloom Industrial Co-operative Societies with a membership of 15,275 weavers.

1.4 OBJECTIVES

In view of the importance of the sericulture sector in Nation's GDP and in the lives of marginal & small farmers' particularly tribal population, the study was undertaken to suggest appropriate mechanism for healthy growth in sericulture sector with the following objectives.

1. To assess the status of sericulture in Jammu and Kashmir region.
2. To analyse the structural and functional value chain of silk.
3. To ascertain the challenges of sericulture farming in Jammu and Kashmir
4. To explore the potential for promoting cooperative FPO in Sericulture.

2. RESEARCH METHODOLOGY

The present study was undertaken in Jammu and Kashmir to explore the key stakeholders involved in the sericulture, supply & value chain and scoping for the cooperative FPOs. The study follows the descriptive research design. The data was collected through both primary and secondary sources. The primary data collected through face-to-face interaction with farmers through semi-structured interview schedule and Focus Group Discussions (FGDs) were made with purposively selected 150 sericulture farmers of six districts of Jammu and Kashmir (Refer Table 2). The secondary data was collected from Central Silk Board and State Sericulture Department.

Table 2: Sampling Plan

Sl. No.	Villages	District	Number of Farmers Interacted
1.	Lamberi, Nowshera, Rajal, Bagnoti, Dharat	Rajouri	25
2.	Ramnagar, Khoon Bilapsur, Deot, Ghordi	Udhampur	25
3.	Tharakalwal, Gujru Nagrot, Dangara, Dharamkot, kishanpura	Kathua	25
4.	Brisnoo, Brariangan, Khyar, Sheikpora, Batapora	Anantnag	25
5.	Lalpora, Chandigam, Kandi, Panditpora, Bungam,	Kupwara	25
6.	Yatipora, Tarhama, Hangoora, Dobiwan, Narbal	Baramulla	25
		Total	150

2.1 DESCRIPTION OF LOCALE OF STUDY

Jammu & Kashmir state comprises of two regions *viz.*, Kashmir and Jammu. The state is divided into 20 districts, 10 each in Jammu and Kashmir regions. The climate of the state varies from alpine in the North-East to sub-tropical in South-West. Average annual rainfall is about 75 mm in alpine area (Kashmir valley) to 1150 mm in sub-tropical area (Jammu region). The Jammu & Kashmir state's economy is predominantly agriculture dependent and nearly 70% of population is directly or indirectly engaged in agricultural and allied occupations. Jammu & Kashmir is globally known tourist destination because of its natural beauty and *Mata Vaishno Devi Shrine*.

Sericulture industry in the state boasts of its glorious past. Silk has been one of the cherished heritages of Jammu & Kashmir with sericulture activity in the valley finding a mention in the ancient Sanskrit scriptures including *Rajtarangni*. By the first half of

20th century, Kashmir had a dynamic Silk trade with its precious silk yarn exported not only to the Great Britain but also to whole of Europe. The available records reveal that in the year 1855, Kashmir was in a position to supply 25000 oz. of silkworm seed to Europe. Because of this, the silk industry of Kashmir gained a pivotal position on the silk route of Europe.

3. RESULTS AND DISCUSSION

3.1 SOCIO-ECONOMIC CONTEXT OF SILK VALUE CHAIN IN THE STATE

J&K Sericulture Development Department is one of the oldest/ ancient departments in the country which came into existence in the year 1889 under the monopolistic control of government to promote silk industry in the state. Sound infrastructure including mulberry nurseries, silkworm seed stations and silk reeling/ weaving factories were established and thereby the State became one of the leading silk producing states. Silk yarn apart from its use as a textile fiber, is also being utilized as a material for parachutes. Jammu division contributes a significant silk production of 67% in the State and 1.5 per cent to total silk production.

Jammu & Kashmir is a truly a bivoltine silk producing state owing to its conducive climate. It produces high quality bivoltine silk and helps in improving socio-economic conditions of the rural masses. Sericulture continues to be an important subsidiary occupation for more than 30,000 rural families in the state. It is being practiced in 20 districts the major one in Jammu division are *Rajouri*, *Udhampur* and *Kathua*, whereas in Kashmir division *Anantnag*, *Kupwara*, *Baramulla* and *Pulwama*. About 80% of the state's total cocoon production comes from these seven districts. Jammu & Kashmir is the only traditional sericulture state in north India and it has shares about 65% of the total raw silk produced in North India.

Presently there are about seven lakh mulberry trees – 53 per cent (370,000) are in Jammu and 47 per cent in Kashmir. There are 2800 villages and 33000 households in which sericulture is generating an income of Rs. 2026 lakh annually and 3.5 lakh mandays activities are associated with this profession. Sericulture department now has 173 nurseries spread over an area of 963 acres, and 374 mulberry blocks over an area of 2215 acres across the state. Out of these, 1500 villages are situated in Kashmir and the remaining 1300 villages in Jammu. The annual production capacity of nurseries is about 30 lakh plants. The mulberry blocks serve as leaf reservoirs for the landless and marginal farmers.

3.1.1 Age

It is clear from below Table 3 that majority of the respondents (63.50%) were old aged (58- 75 years) followed by 24.50 percent belonged to middle age group and rest 12.00 percent were from young age group.

Table 3: Age of the Respondents (Years)

Sl. No.	Age group (years)	Frequency	Percentage
1.	Young (24-40)	18	12.00
2.	Middle (41-57)	37	24.50
3.	Old (58-75)	95	63.50
	Total	150	100.00

3.1.2 Educational Status

It is clear from the Table 4 majority of the respondents (29%) have qualification upto high school level followed by middle level (21.33%), primary level 16.66 %, and 14.00% farmers were illiterate. Only 6.66 % farmers have qualification upto Graduate level.

Table 4: Educational Status of Respondents

Sl. No.	Category	Frequency (n=150)	Percentage
1.	Illiterate	21	14.00
2.	Primary Level	25	16.66
3.	Middle Level	32	21.33
4.	High School	44	29.33
5.	Higher Secondary	18	12.00
6.	Graduate Level	10	6.66
	Total	150	100

(Source: Primary Survey)

3.1.3 Land holding Size of Silk Growers

It was found that majority (74.66%) of the farmers belongs to marginal category followed by small category (17.33%), semi-medium (4.00%) and medium (2.00%) and only 1.30 % farmers belong to large category.

Table 5: Land holding Size of Respondents

Sl. No.	Category	Operated Area	Percentage of Farmers from Sample	Percentage
1.	Marginal	Less than 1 ha	112	74.66
2.	Small	1 – 2 ha	26	17.33
3.	Semi-Medium	2 – 4 ha	6	4.00
4.	Medium	4 – 10 ha	3	2.00
5.	Large	More than 10 ha	2	1.30

(Source: Primary Survey)

3.1.4 Family Income

Data regarding total family income of respondents has been presented in below Table 6. This table shows that maximum number of respondents (35.33%) belonged to lower income category followed by 21.33 percent respondents who belonged to lower middle-income category. A sizeable number of respondents (16.00 %) belonged to extreme lower income category and 15.33 percent respondents belonged to upper middle-income category. Only

12.00 percent respondents belonged to high income category.

Table 6: Family Income of Respondents

Sl. No.	Category	Frequency (n=150)	Percentage
1.	Extreme Lower Income (< Rs.33000 p.a.)	24	16.00
2.	Lower Income (Rs. 33001-Rs. 55000 p.a.)	53	35.33
3.	Lower Middle Income (Rs. 55001-Rs. 88800 p.a.)	32	21.33
4.	Upper Middle Income (Rs. 88801-Rs. 150000 p.a.)	23	15.33
5.	High Income (>Rs. 150000 p.a.)	18	12.00
Total		150	100

(Source: Primary Survey)

3.2 ANALYSIS OF SILK VALUE CHAIN

3.2.1 Structural Analysis

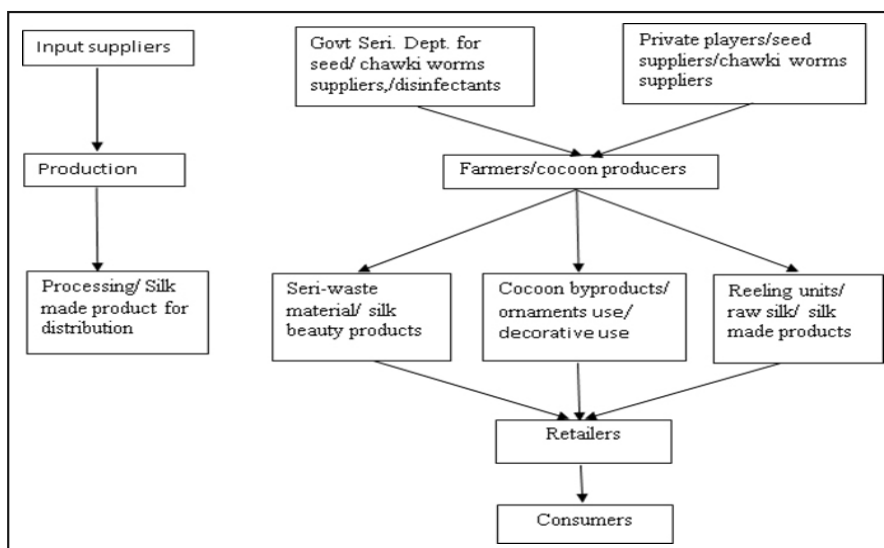


Fig. 4: Structural Analysis of Silk

3.2.2 Functional Analysis

Sericulture sector can be divided in two parts- one is -pre-cocoon|| and -post-cocoon|| sector. The pre-cocoon sector means host plant plantation to cocoon formation. These activities are done mainly by farmers individually. Farmers grows mulberry plantation on the basis of their resources and capabilities. The mulberry leaves feed to silkworm and after one month of feeding a cocoon would be ready. The farmers then sell these cocoons to different middlemen, traders in the market. The major stakeholders in sericulture industry are the cocoon producers, grainures, reelers, weavers, SHGs and NGOs. All of them work hand in hand to run this agro-based industry to strengthen the rural economy. The role played by various members of the value chain is as follows:

Input Supplier: In sericulture main input suppliers are Govt department. Seed, disinfectants, technical guidance etc. provided by Govt department at free of cost.

Grainures: are the persons engaged in preparation of disease-free silkworm egg. By and large, they meet about 70% disease-free laying requirement for the industry and the rest are supplied by the Central Silk Board and respective State governments. The price of silkworm eggs is Rs 500-600 per ounce or 100dfls and price of silkworm eggs after chawki is between 1000-1200 Rs per ounce.

Cocoon Producers/ Farmers: are professionally engaged in seed cocoon production. The farmers get trainings on rearing cocoon and its quality consciousness from Silk Board. The farmers generally involved only in the pre-cocoon stage i.e. from Mulberry Plantation to Cocoon Formation. In Jammu and Kashmir approx. 26000 families involved in sericulture activities.

Yarn Manufacturers - Reelers & Spinners: are persons involved in cocoon spinning and reeling. Unwinding of silk filament from the cocoon is known as reeling'. Quality of the yarn depends on skilled manoeuvring of the spinners and reelers. Spinning of pierced cocoon is another skill through which spun yarn is obtained. The reelers and spinners play very important roles in the silk industry. The main raw material used by Handloom sector is yarn, which is being produced by spinning mills. Henceforth, spinners play a vital and indispensable role in the operational efficiency and value addition in yarn manufacturing.

Spinners produce various yarns and hank yarn (against Hank Yarn Obligation) which is then supplied to several intermediaries, i.e. wholesale traders, National Handloom Development Corporation Ltd. (NHDC)/ yarn banks, yarn dyers and to end users, i.e. societies/ Apex organizations.

Reelers majorly show their strength in converting cone/ cop yarn into hank yarn. They are basically independent outside reelers who work independently in hank yarn manufacturing. Reelers supply hank yarn to wholesale traders, yarn dyers and spinners as well.

Weavers/ Master Weavers and Weavers Association: are the artisans who are engaged in weaving of silk and contribute much to shape the silk wishfully and create a market for finished product. Weaving is a mechanism through which the silk yarn can be converted into fabrics by interlacing with each other. For weaving warp preparation and weft preparation are important. Raw silk wounded longitudinally on beams called warp. For preparation of any dress material, quality of warp is required and it is generally made from bivoltine cocoons. The yarn passes through warp yarn vertically are called weft. The weft yarn is made through multivoltine cocoons.

Self Help Group (SHG): Sericulture is women friendly occupation because in that whole process mostly inside home job is there, no need to go outside, no need for any heavy work. So women who are working in self-help group mainly doing feeding work to silkworm and working in reeling unit. In some decorative work also cocoon made ornamental things made by women who are working in self-help group.

Non-Government Organisation (NGO): are registered bodies engaged in promoting agriculture and rural development. At present only one NGO PRADAN working in Jharkhand in Tasar Sericulture. PRADAN provide training, technical knowhow and other sericulture related assistance to farmers.

Pre-harvest Contractor: For post-harvest or selling of cocoon there is committee in each state government for decide the rate of cocoons for different grades. Many times it is fixed by the govt or it may be decided by open bidding. For purchasing of cocoons both government and private parties are there every times.

Table 7: Functional Analysis of Value Chain

Activity	Agents/ Stakeholders	Output
Input supplier	Govt and private agency	Provide seed, disinfectants
Cocoon producer	Farmers	Producing cocoons
Cocoon marketing	Cocoon traders	Purchasing cocoons
Cocoon Processing	Reeling units	Silk yarn
Final products/ clothes	Weavers and private agencies	Final product - Silk made cloths

(Source: Primary Survey)

3.2.3 Value-Chain Analysis

As highlighted above, the sericulture industry includes major activities like mulberry cultivation, silkworm rearing, silk reeling & spinning and silk weaving. Reeling, spinning and weaving is the most important activity. Table 8 show the price spread of silk, where farmers are involved upto cocoon production only received on an average Rs. 700/- per kg i.e 25-27 per cent of final price of the raw silk. Further various

products are produced from raw silk fibre such as sarees, dress materials, garments, etc. and accordingly they are priced. In this study the value chain analysis is limited up to preparation of Raw Silk.

Table 8: Price Spread of Silk

Sl. No.	Particulars	Amount (in Rupees)
1.	Cost of Production for One kg of dry cocoon	360/-
2.	Average Price of Dry Cocoon (per kg)	Grade A - 975/- (2021) Grade B - 750/- (2021) Grade C - 600/- (2021)
3.	Average Price Received by Farmers/ Producers	700/- per Kg
4.	Price of Raw Silk (Cocoon stage to Silk through Reeling & Spinning) - Rs/ kg	2,562/- (2021) (Mulberry Raw Silk)

(Source: Primary Survey)

The Central and State government is providing many measures in setting up of reeling & weaving units and other required sericulture infrastructure. However, the cocoon growers are not able to break the cartel of middlemen and traders, besides lack of awareness and entrepreneurial spirit and other challenges as highlighted below.

3.3 CHALLENGES IN SERICULTURE FARMING

As a result of FGD with silk growers and other key stakeholders, it was found that growers face many issues related to input supply, mulberry production, cocoon management, reeling and weaving management, logistics, and marketing. The details are as follows -

Government Challenges: Main problem with government is, unable to reach each and every farmer for technical assistance, rearing house assistance, rearing kit assistance. Other main problem for government unable to fix price of cocoon. Sometime imported silk yarn price is cheaper than Indian silk yarn price that's why reeling unit owner prefer to import than purchasing Indian silk.

Production Related: At farmer level many challenges are there such occurrence of diseases during rearing and no insurance cover like other agricultural crops, no surety of good price of their cocoon some time price is very low that's why many farmers leaving sericulture, in the area of Jammu and Kashmir, where bivoltine (only two crops in a year) races are there sericulture can be done as a side crop only, it cannot be run whole year. In such type of area reeling unit also not running because of unavailability of cocoon in whole year.

Reeling Units Management: Raw material availability across the year is biggest issue followed by unavailability of appropriate infrastructure including reeling machine. In addition, the challenges like lack of training, marketing support, credit facility, less

wage rate to workers, lack of interest of future generations in this activity and trade, etc hampers the performance of reeling units.

Weaving Units: the raw material availability and nature of wages in the weaving industry is the most important concern followed by credit availability, marketing support, women participation, training facility and lack of interest of future generation in this activity.

Marketing Related: In sericulture timely marketing is very necessary because silk is protein and after cocoon formation it should be sold within 10 to 15 days for getting good quality silk. Very less involvement of govt in purchasing of cocoons, it is purchased by traders from west Bengal, Karnataka and other states that's why they are giving less price.

In addition, there is no any producers organisation found in sericulture, especially in North India, Because of that voices of farmers are not reaches to government such as price issue, insurance issue, market issue, and so on.

3.4 SCOPING FOR COOPERATIVE FPOs

As highlighted above, there are different stakeholders involved in the sericulture, mostly working in the isolation and thereby marketing has largely been in the hands of number of middlemen and traders. Many studies have demonstrated that within handloom weavers' cooperative societies, coolie weavers and master weavers have also been struggling with many issues like attractive wage rates and affordable credit facilities (Majumdar *et al.*, 2017). In addition, private players including traders have been purchasing silk yarns from reelers of Jammu and Kashmir and exported to different parts of the country particularly West Bengal state for producing silk-based products. This incurs huge transportation cost which has to be borne by reelers and cocoon producers.

The Central and State government uses the 'cluster based approach' for the promotion of sericulture, which comprises of 500 to 1000 farmers. Accordingly, government undertakes many developmental interventions such as assistance for rearing house, rearing equipment's, distribution of mulberry plants, etc. However, all farmers of the cluster works independently, there is no coordination among them. Further, farmers are heavily dependent on government for getting resources. Moreover, the resource poor farmer, particularly landless and other farmers are always left out in the process due to land constraints in cultivating mulberry plants and rearing house.

Thus, the quantitative and qualitative analysis indicates that the silkworm rearing mostly done by marginal and small farmers, having land constraints for mulberry plantation, silkworm rearing, cocoon storage, reeling and weaving. In addition, producers share in the consumer rupee is approx. 10 to 15 per cent to the price of final silk-based products. The respondents/ cocoon producers have shown their willingness

to join any form of collective organization for ensuring profitability in the sericulture farming. The post-cocoon stage is crucial as it involves activities like reeling, twisting, spinning, and weaving. The authors suggest that the cooperative form of farmer producer's organization would help in establishing integrated silk value-chain having scale of production, standardization of practices, skill up-gradation, and thereby protecting the need & interest of cocoon producers through democratically managed member-driven cooperative organization.

4. CONCLUSION

The present study was undertaken to assess the status of sericulture industry particularly in Jammu and Kashmir. The study focuses on the structural and functional analysis of silk value chain, challenges in sericulture farming and exploring the potential for promoting cooperative FPOs. Jammu & Kashmir is a truly a bivoltine silk producing state owing to its conducive climate. It produces high quality bivoltine silk and helps in improving socio-economic conditions of the rural masses in 20 districts particularly *Rajouri*, *Udhampur* and *Kathua* of Jammu division and *Anantnag*, *Kupwara*, *Baramulla* and *Pulwama* of Kashmir division. About 80% of the state's total cocoon production comes from these seven districts. Jammu & Kashmir is the only traditional sericulture state in North India and it has shares about 65% of the total raw silk produced in North India.

The sericulture industry includes major activities like mulberry cultivation, silkworm rearing, silk reeling & spinning and silk weaving. However, these activities are undertaken in the isolation. The small and marginal farmers are independently involved in cocoon production. The marketing of cocoons and yarns are largely in the hands of middlemen and traders. The Central and State government is providing many measures in setting up of reeling & weaving units and other required sericulture infrastructure. However, the cocoon growers are not able to break the cartel of middlemen and traders, besides lack of awareness and entrepreneurial spirit.

The authors suggest that in the current rapidly growing dynamic economic environment, the focus should be on innovations in sericulture in terms of product, processes, machinery, marketing, business model and forms of organization in order to give voices to artisans/ cocoon growers, improving working conditions of workers, designing and developing products with improved functional properties, increasing efficiency and thereby productivity of workers, developing cost effective processes, replacing older, slower and conventional machines with modern and technologically advanced machineries and finally increasing the visibility of Indian textile industry.

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