
Chapter 1

Introduction

HISTORY OF SERICULTURE

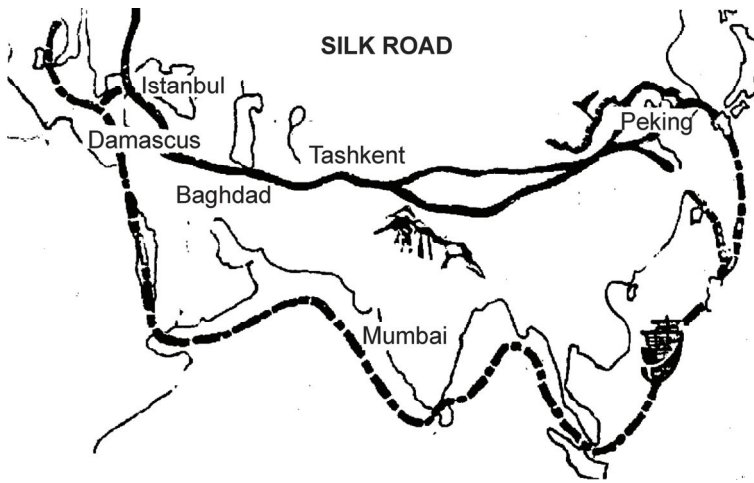
"SILK IS THE QUEEN OF TEXTILES" though there is synthetic silk production, synthetic fibre is no match to natural silk. Natural silk is unique and has its own importance, elegance and lustre.

There are more than 25 countries practicing sericulture in the world. Historical evidences reveal that China is the first country where Sericulture was practiced in the Chan-Tong province secretly since more than 3000 years. Slowly after 1200 B.C, this industry spread over to Korea, then to Japan, however, there are many episodes and different opinions on spread of the industry to Japan. It is believed that this has come to Japan during 3rd century B.C. itself. However, Japan has concentrated more on silk industry only after 19th century.

From China when sericulture spread to Tibet, then the industry spread to India about 140 B.C. and is believed that initially the industry started in the areas flanking Ganga and Brahmaputra rivers.

British Government encouraged this industry expanding it to the private sector after 1836. In Jammu & Kashmir, Mysore, and West Bengal this industry flourished well. Later on West Bengal declined in the production of silk. During 19th century the disease called "pebrine disease" wiped out the total silk industry in France, Middle-East and European countries. Thanks to Louis Pasteur who discovered the method of moth examination to control the Pebrine disease. The silk was said to be carried from India and China to European countries along 6000 mile long road, passing through Bagdad, Tashkent, Demascus, Istanbul. The 6000 mile long lengthy road is historically called as "THE SILK ROAD."

2 An Introduction to Sericulture



WORLD RAW SILK PRODUCTION

Commercial production of silk through silkworm rearing is "SERICULTURE.

Sericulture is an agro-industry, production of mulberry leaf which is the food plant for silkworm is an agriculture activity, followed by silkworm rearing, silk reeling, twisting and weaving processing are industrial activities. Hence, sericulture is an agro-industry.

Sericulture is a labour intensive agro-industry and is well suited to the developing countries like, India, where unemployment is a serious problem. Sericulture industry has vast scope to earn foreign exchange through marketing of silk goods. An added advantage to Indian Sericulture industry is, most of our agriculture communities are having less land holdings, hard working but with less investing capacity.

The people will accept any innovative activity subject to sustainability to their living atmosphere. Adaptability depends upon the economic returns.

"Sericulture" activity rightly fits into the socio-economic structure of rural areas and works as an effective tool for rural reconstruction to uplift the economy of weaker sections.

All the above said factors assure the Indian agriculturists to adopt sericulture. Sericulture is the term denoted for production of silk through silkworm rearing. India is proud of producing all the four types of silk, i.e., 1) Mulberry 2) Tasar 3) Eri and 4) Muga. The food plants for production of all the above four types of silk are different and these can be grown in Indian environmental conditions.

With reference to production of mulberry silk, India was 3rd in the world to produce mulberry silk. And presently India holds 2nd position in the world in silk production.

Since, the potentiality for production of mulberry raw silk is more, Research and Development is also concentrating more on increasing mulberry productivity with less land use.

Mulberry (*M. indica*) is the food plant for silkworm. The climatic conditions in the states of India are suitable for the growth of mulberry. Further, mulberry can be grown in wide range of soils, and it can tolerate both tropical and temperate atmosphere. This is a deep rooted perennial plant and once planted can last even for 10-15 years.

Performance of Sericulture Sector

Particulars	2015-16		2016-17		2017-18	
	Achmnt	Target	Achmnt.	Target	Achmnt.(P)	
Mulberry Plantation (Lakh.ha)	2.09	2.27	2.17	2.41	2.26	
RAW SILK PRODUCTION						
Mulberry (Bivoltine)	4,613	5,260	5,266	6,200	5,855	
Mulberry (cross breed)	15,865	17,400	16,007	17,275	16,207	
Sub Total (Mulberry)	20,478	22,660	21,273	23,475	22,062	
VANYA						
Tesar	2,819	3,285	3,268	3,450	3,018	
Eri	5,060	5,835	5,637	6,675	6,661	
Muga	166	220	170	240	190	
Sub Total (Vanya)	8,045	9,340	9,075	10,365	9,869	
Grand Total	28,523	32,000	30,348	33,840	31,931	

Source: The data received from DOSs & Compiled at CSB (Central office); P: Provisional.

SILK PRODUCTION DURING 2017-18

During 2017-18 the total raw silk production in the country was 31,931 MT which is an increase of 5.2% over the production achieved during the last year and around 94.4% of the annual targeted production for the year 2017-18.

The mulberry silk production was 3.7% more during 2017-18 over the last year. The bivoltine raw silk achieved a recode production of 5,85 MT during 2017-18 by registering 11.2% growth over previous year. Similarly vanya silk, which includes Tasar, Eri and Muga raw silks, has achived 8.7 growth during 2017-18 over 2016-17.

The area under mulberry during 2017-18 was up by 4.4%

4 An Introduction to Sericulture

RAW SILK IMPORTS

The Quantity and value of raw silk imported during year 2014-15 to 2016-17 and for the year 2017-18 (till February-18) are given below:

Year	Quantity	Value (Rs.in Crores)
2014-15	3489	970.82
2015-16	3529	1006.16
2016-17	3795	1092.26
2017-18*	3538	1151.01

*Figure indicated for the period of April-17 to February -2018 (Provisional)

Source: DGCI&S, Kolkata.

SILK & SILK-GOODS EXPORT EARNINGS (₹.in Crore, US \$ in Million)

Itemwise Export	OCTOBER				APRIL TO OCTOBER			
	2018		2017		2018-19(P)		2017-18	
	₹.	US \$	₹	US \$	₹.	US \$	₹.	US \$
Raw Silk	NE		NE		1.14	0.17	NE	
Silk yarn	0.82	0.11	0.44	0.07	4.42	0.64	3.71	0.58
Fabrics, Madeups	42.23	5.88	24.21	3.72	228.29	33.25	202.21	31.37
Readymade Garments	95.69	13.25	44.10	6.78	650.17	94.69	585.62	90.85
Silk Carpet	0.81	0.11	1.89	0.29	19.05	2.77	5.91	0.92
Silk Wastes	11.60	1.61	9.37	1.44	84.44	12.30	51.99	8.07
TOTAL	151.35	20.96	80.01	12.29	987.51	143.83	849.44	131.78

NE: No Export; P: Provisional data

Source: DGCI&S, Kolkata

Exports

The silk goods export earnings have been decreased over the years due the global recession and reduction in demand for silk goods in western countries (Western Europe and the USA, which are the major

consumers of silk goods However, the silk exports are picking up to the non-traditional/new market such as the UAE, Nigeria, Sudan, Thailand etc., which is an encouraging sign the export earnings during 2016-17 were Rs. 2,093.42 Crores. Export Value of silk goods during the last 3 years 2015-16 & 2016-17 and for the year 2017-18 (till Feb'18) are given below:

Items	2015-16	2016-17	(Rs. in Crores)
			2017-18 (Apr 17 to Feb 18)
Natural Silk Yarn	30.31	15.33	4.29
Silk Fabrics	1280.60	1051.65	307.41
Readymade Garments	1078.39	864.33	868.78
Silk Carpet	16.88	63.78	14.08
Silk Waste	89.80	98.33	86.74
Total	2495.98	2093.42	1281.30

Note: Final Data is based on ITC (HS) codes details received from source data.

Source: FTSI & MSFTI, DGCIS, Kolkata, P: Provisional

Employment Generation

The employment generation in the Country is raised to 8.51 million persons in 2016-17 Compared to 8.25 million persons in 2015-16, indicating a growth of 3.15%.

EMPLOYMENT POTENTIALITY

Mulberry silkworms are domesticated and rearing of silk worms is possible in dwelling houses with little modifications. The recommended environmental conditions like required temperature and humidity can be artificially created for rearing of silk worms in the available accommodation.

Therefore, the labour intensive Seri-industry in India is helpful to eradicate unemployment and increase economic levels of rural poor. As the industry is labour oriented, all the family members of farm community could take part in one or the other activity of sericulture right from mulberry cultivation to silk weaving (plantation, weeding, irrigation, fertilizer application, leaf picking, leaf transportation and silk reeling etc.).

One acre of mulberry provides an employment opportunity to (5) persons, directly or indirectly. Further, the role of women in

6 An Introduction to Sericulture

sericulture industry is remarkable. They play a major role. Their involvement is about 60% in this industry.

VARIETIES OF SILK: MULBERRY-NON-MULBERRY

"**SERICULTURE**" can be divided into (a) Mulberry and (b) Non - Mulberry (includes Tasar, Eri, Muga).

(A) Mulberry

More than 90% of silk produced in the world is mulberry silk. Mulberry silk is drawn from the mulberry silk cocoons, i.e., silkworm is fed with mulberry leaves which passes through five stages, in case of tetromoulters finally it builds strong cocoon. The silkworm feeding on mulberry leaf, forms an encasement around it, to protect itself at the time of metamorphosis. This encasement is known as cocoons, which is commercially important product in sericulture.

Depending upon the life cycle of silkworm in a year they are termed as uni-voltines with single generation in a year, bi-voltines with two generations in a year. Multi-voltines has more than two generations in a year.

India is the only county in the world where all four types of commercial silk is produced. The climatic conditions differ from place to place in India. The mulberry sector can be divided into two zones i.e., Uni-voltine and Bi/Multi-voltine. The states suitable for rearing of uni-voltine mulberry silk are Jammu & Kashmir, Punjab, Himachal Pradesh and some parts of Uttar Pradesh. Uni-voltine and Bi-voltine silkworm rearing can be practiced where the atmospheric conditions are similar to that of temperate zones, i.e., low temperatures. The multi voltine silkworm races are usually reared in the states of Andhra Pradesh, Karnataka, West Bengal, Bihar, Manipur, Assam, etc.

(B) Non-Mulberry

Under non-mulberry though, Tasar, Eri, Muga varieties of silk are covered. But the maior Production of non-mulberry silk is of Tasar only.

Tasar silk is practiced in Bihar, Orissa West. Bengal, Madhya Pradesh, Maharastra, U.P., Manipur and some parts of Andhra Pradesh.

The Eri silk is mainly distributed in Assam, Manipur, Nagaland, Meghalaya and Bihar only, however, small sector of Eri silk is also produced in West Bengal, Arunachal Pradesh, and Orissa.

Muga silk is produced only in Assam, however a negligible quantity of Muga silk is produced in Arunachal Pradesh, Mizoram and Nagaland.

Tasar: Tasar silk worms belong to the genus *Antheraea*. Though, the food plants do not influence the colour of silk or cocoon but contributes to the quantitative characters. The tasar silk worms are reared on 1) *Terminalia tomentosa* 2) *T. Arjuna* and 3) *Shorea robusta* which are primary the host plants besides there exists many other secondary food plants i.e., (a) *Zizyphus jujuba* (Ber), (b) *Lager stroemia parviflora* (sidha), (c) *Careya arborea* (kumbi) etc., *A.mylitta* which produces the traditional tasar silk in India from the states of Bihar, Madhya Pradesh, Orissa, Andhra Pradesh, Assam and West Bengal. BiMulti-voltines or reared in north Indian States and Uni/By-voltines are mostly reared in central parts of India.

A.mylitta is a polyphagous, it thrives on 3-main food plants i.e., *T. tomentosa* (asan), 2) *T.Arjuna* (arjun), 3) *Shorea robusta* (sal).

Eri: Eri silk worms may be of the species of *philosamia ricini* or *P.cynthia*. The main food plants to eri silk worms are *Ricinus communis* (caster) and *Tapioca* (*manihot utilissima* pohl)

The *P.ricini* is domesticated and fed on caster leaves. Eri cocoons are open ended cocoons utilised for spinning purpose only. The filament of cocoons is not continuous like, mulberry silk and also not even or uniform in nature. The Eri silk is white or brick red in colour Eri silkworm is found in the states of Assam, Bihar, Meghalaya, West Bengal, Manipur, Nagaland, Arunachal Pradesh and Orissa.

Muga: The muga silk producing state in India is mainly Assam, However, a negligible quantity of muga silk is produced in Arunachal Pradesh, Mizoram and Nagaland. The muga silkworm (*Anthereae assama*), is polyphagous, primarily feeds on *Machilus bombycina* (som) and *Litsaea polyantha* (soalu). Secondary food plants also exist. The muga silk is very attractive and golden yellow in colour.

MULBERRY AND VANYA RAW SILK PRODUCTION STATISTICS**(Unit: metric Tonnes)**

Years	Mulberry	Tasar	Eri	Muga	Total
2000-01	14,432	237	1,089	99	15,857
2001-02	15,842	249	1,160	100	17,351
2002-03	14,617	284	1,316	102	16,319
2003-04	13,970	315	1,352	105	15,742
2004-05	14,620	322	1,448	110	16,500
2005-06	15,445	308	1,442	110	17,305
2006-07	16,525	350	1,485	115	18,475
2007-08	16,245	428	1,530	117	18,320
2008-09	15,610	603	2,038	119	18,370
2009-10	16,322	803	2,460	105	19,690
2010-11	16,360	1,166	2,760	124	20,410
2011-12	18,272	1,590	3,072	126	23,060
2012-13	18,715	1,729	3,116	119	23,679
2013-14	19,476	2,619	4,237	148	26,480
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

Source: Central Silk Board, Bengaluru