

CHAPTER VIII

SERICULTURE

India continues to be the second largest producer of silk in the world and has the distinction of producing all the four varieties of silk. In 2004-05, production was 16500 M.T, of this mulberry accounted for 14620 M.T. (88.6%), and non-mulberry silk 1890 M.T. (eri 8.8%, tasar 2.0% and muga 0.6%). Sericulture provides gainful occupation to more than five million workforce in the rural and semi-urban areas in India. Of these, a sizeable number of workers belong to the economically weaker sections of society. There is substantial involvement of women in this industry.

Budget

For 2005-06, a provision of Rs. 136.42 cr. under Plan and Rs. 60.66 cr. under non-plan have been made for Central Silk Board (CSB).

Exports

The silk export earnings during 2003-04, 2004-05 and 2005-06(April to Aug.) are in Table 8.2.

CENTRAL SILK BOARD

The Central Silk Board(CSB) was set up in 1949 when Central Government assumed

Table 8.1

Overview

Sl. No.	Particulars	2004-05	2005-06 (Anticipated)
I.	Standing Area under mulberry (Lakh ha.)	1.72	1.90
II.	Production of raw silk (tons)	16500	17520
III.	Employment (lakh persons)	58.00	59.40

Table 8.2

Exports

(Rs. in crore)

	Items	2003-04	2004-05	2005-06 (April-Aug.)
1.	Natural Silk Yarn, fabrics & Made-ups	1,954.11	2,008.33	715.54
2.	Readymade Garments	699.52	746.29	385.16
3.	Silk Carpets	120.22	123.65	28.16
4.	Silk waste	5.34	1.29	3.15
	Total	2,779.19	2,879.56	1,132.01

* Provisional figures.

(Source Directorate General of Commercial Intelligence & Statistics, Kolkata)



Cocoon Rearing

responsibility for the development of the silk industry by Parliament passing the Central Silk Board Act, 1948. Headquartered at Bangalore, and headed by a Chairman and 35 members, the Board works in three broad areas of Research & Technology Development, Seed Maintenance, and Development of Sericulture & Silk Industry to support, supplement & facilitate the efforts of the State Governments. It also extends support to states in the form of joint projects and developmental assistance under plan schemes. The Board also undertakes voluntary quality inspection of exportable silk goods..

RESEARCH AND DEVELOPMENT

The Research & Training Institutes of the CSB provide R&D and Training support for the development of sericulture. The Institutes at Mysore (Karnataka), Berhampore (West Bengal) and Pampore (Jammu & Kashmir) deal with mulberry sericulture and one at Ranchi (Bihar) deals with Tasar culture. The institute established at Ladoigarh, Jorhat (Assam) deals with Muga and Ericulture. The Regional Sericultural Research Station (RSRS/

RTRS) for mulberry and non-mulberry has been functioning for the dissemination of research findings and for tackling the regional field issues of industry. Besides, a network of Research Extension Centres (REC) for mulberry and non-mulberry are also functioning to provide extension support to sericulturists. In order to provide R&D support in post-cocoon sector, the Board has established a Central Silk Technological Research Institute (CSTRI) at Bangalore. In addition, the CSB has also set-up a Silkworm Seed Technology Laboratory (SSTL) in Bangalore (Karnataka), a Central Sericultural Germplasm Resources Centre (CSGRC) at Hosur, (Tamil Nadu) and a Seri-Biotech Research Laboratory (SBRL) at Bangalore.

Under the programme of transfer of technology, CSB continues to collaborate with National Research Development Corporation (NRDC), New Delhi towards patenting and commercialization of technologies developed by R&D institutes. During the period, the following processes evolved by R&D Institutes of CSB have been filed for patenting through NRDC.

- Production of non-woven flat silk sheet (CSR&TI, Mysore)
- Preparation of super-glue from waste mulberry stem (CSR&TI, Berhampore)
- Development of muga weft yarn (BANI) (CMER&TI, Ladoigarh)
- Low cost muga cocoon dryer (CMER&TI, Ladoigarh)

The Board has commercialized the following products / technologies for the benefit of farmers' community.

- New cardboard mountages and harvester (CSR&TI, Mysore)
- 'ANKUSH' - a new silkworm bed disinfectant (CSR&TI, Mysore)
- 'LABEX' - Silkworm bed disinfectant (CSR&TI, Berhampore)

The projects on sustainable sericulture development through "Integrated Nutrient Pest and Disease Management" and Mulberry Sericulture based intensive farming system research – farmers' participatory mode" in 3 locations in the states of Karnataka, Andhra Pradesh and Tamil Nadu initiated earlier is under progress. Protocol for in-vitro techniques developed for callus induction and differentiation in mulberry to be used in genetic transformation and In-vitro screening of mulberry genotypes for abiotic and biotic stress studies were initiated. CSR2 x CSR4 hybrid specific to spring season and CSR2 x PAM 111 hybrid for specific to autumn for Kashmir region are recommended. On-farm trials of pruning package developed at Sahaspur (Uttanchal) revealed a gain of 23% in leaf yield and probability of introducing a third crop during summer. Ready reckoner for phosphatic and potassium fertilizer recommendations for mulberry growing areas under irrigated conditions of West Bengal and rain-fed conditions of West

Bengal, Jharkhand, Orissa and Assam have been developed.

During 2005-06 (up to September, 2005) several technology trials were planned at the Regional Research Stations, which includes – testing of new productive bivoltine hybrids, new bed disinfectant formulations, plant product formulation, improved tillage method, new mountages, chawki rearing practices, temperature tolerant bivoltine hybrids, mulberry package for seed cocoon crop, testing of complete package of practices of mulberry cultivation and silkworm rearing at farmers' level under irrigated and non irrigated conditions. Demonstration of technologies at farms and farmers' field were taken up by the Research Institutes viz., 12 technologies by Mysore, 3 by Berhampore, 13 by Pampore and 19 by SSTL, Bangalore.

Research work on the 'on-farm' sector is focussed at evolving stress tolerant mulberry varieties, which give high leaf yield, breeds superior silkworm hybrids besides evolving improved techniques of silkworm rearing and integrated control of pests and diseases for both mulberry and silkworms. During 2005-06, 227 research projects are to be implemented and are in various stages of progress. (169 in mulberry, 49 in non-mulberry and 9 in post cocoon technology). During 2005-06 (April to Sept 2005), 10 new silkworm hybrids (which includes one double hybrid and two artificial diet hybrids) were authorized for commercial use. Eight (8) mulberry varieties evolved by CSB & State Research Institutes are under authorization trial at 18 test Centres covering all the zones.

Research work on Tasar, Muga and Eri silk is focussed towards improvement of productivity potential of non-mulberry silk in India. Under non-mulberry sector, several technology trials were conducted during 2005-06 at RTRS/RECs level.

On the post-cocoon sector, web silk reeling machine was developed to produce bulky raw silk from inferior quality cocoons. Fabricated elliptical type denier detecting and mechanical indicating device to multi-end reeling machine to produce quality raw silk.

Seed Maintenance

Under the National Silkworm Seed Organization (NSSO), a network of Basic Seed Farms (BSF) produce and supply the basic seed for production of commercial silkworm seed in the seed production centres functioning under CSB and State Departments. Twenty one Silkworm Seed Production Centres (SSPCs) are functioning under NSSO in different States to support the industry. These commercial SSPCs produced 239.16 lakh dfls during 2004-05 and 129.66 lakh dfls during 2005-06 (Upto October, 2005).

On the tasar side, the CSB has established 21 Basic Seed Multiplication & Training

Centres (BSM&TC) and one Central Tasar Silkworm Seed Station (CTSSS) for supply of tropical tasar basic seed & 1 oak tasar grainage and 3 REC-cum-BSM&TCs for supply of Oak tasar basic seed. Under muga sector, 8 Basic Seed Farms and 1 Silkworm Seed Production Centre are functioning. For production and supply of eri seed, CSB has established 5 Silkworm Seed Production Centres. In the year 2005-06 (upto Sept.-2005), 8.177 lakh tasar basic seed, 1.05 lakh oak tasar basic seed, 1.33 lakh muga basic seed have been produced and supplied to State Departments for further multiplication. The muga and eri SSPCs have produced a quantity of 0.74 lakh and 0.65 lakh commercial seeds, respectively during 2005-06 (upto Sept.- 2005).

Training

The CSB organizes a number of training programmes at its Research and Training Institutes. The details of number of persons trained during 2004-05 and 2005-06 (up to Sept. 05) are at Table 8.3.

Table 8.3

	Courses	2004-05		2005-06 [up to Sept'05]		Category of Trainees
		No. of courses conducted	No. trained	No. of courses conducted	No. trained	
1	Structured Courses	3	25	2	26	DOS/NGO
2	Capsule Courses	21	297	16	211	CSB/DOS / NGO
3	Adhoc Courses	30	1,446	31	1,063	Students/ Staff/ Entrepreneurs
4	Summer School	1	18	-	-	Researchers/
	Training Programme/ Refresher course of University Grant Commission	1	25	-	-	Professor
	Total	56	1,811	49	1,300	

Developmental Schemes and Programmes

The development Schemes & Programmes supported by the CSB include those which are funded by CSB's by the Centre or the Centre and the State Government; externally assisted; convergence with rural & other development programmes. During the year the thrust was concentrated on expansion of non-mulberry silks & growth of bivoltine mulberry sericulture, with a focus on increasing productivities & upgrading the quality of the produce. A thrust was given to development of the North East Region. Several new projects were initiated to disseminate eri-culture, using existing castor plantations. Eri was started in states such as Andhra Pradesh, Punjab, Bihar, Uttaranchal, Chattisgarh. The main schemes being implement in silk sector are:

Centrally Sponsored Schemes

i) Catalytic Development Scheme (CDP)

The Xth Plan envisages creating greater opportunities for gainful employment in rural areas through the spread of scientific sericultural practices and by promoting modernization and quality up-gradation of the industry, bestowing special attention to the improvement of productivity in all stages of silk production to ensure higher levels of income to the stake holders, especially the vulnerable section of the society.

During the Xth Plan, CSB is implementing CDP in a modified version by giving greater thrust to bivoltine sericulture and market orientation to non-mulberry sector to achieve the targeted production of 26450 M.T of both mulberry and non-mulberry silks and generate a cumulative employment of 60.03 lakh persons. Special status has also been given to North-Eastern Region, Jammu & Kashmir, Jharkhand,

Chhattisgarh, Uttaranchal and Himachal Pradesh States for development of sericulture and silk industry.

Of Rs.450.00 cr. approved by Govt. of India for implementation of central sector programmes, during Xth plan, an outlay of Rs.180.98 cr. has been earmarked for implementation of CDP components. CSB has also taken up implementation of two more projects viz., "IT Initiatives" and "Quality Certification Systems for Silk" during Xth Plan. The Project "IT Initiatives" aims at dissemination and transfer of technical information to rearers, reelers and others involved in the silk trade through Data Base Development, installation of information Kiosk at nodal points and creation of Portals. The objective of the "Quality Certification Systems of Silk" is to ensure quality maintenance at different levels of production process through quality assessment and quality certification.

A sum of Rs.43.87 cr., Rs.39.23 cr., Rs.48.44 cr. and Rs.27.25 cr. have been spent / released by CSB towards implementation of various components under CDP during 2002-03, 2003-04, 2004-05 and 2005-06 (upto Oct'05) respectively.

ii) Special Sericulture Package for J&K

The then Prime Minister of India announced a package for the State of Jammu & Kashmir which includes a special assistance for development of sericulture and Silk Industry in J&K during Xth Plan period (2002-07).

The total cost of the above package during Xth Plan works out to Rs.16.35 cr. Since J&K State has been considered as a special status State, it is entitled for 90% central assistance from sericulture schemes of Central Silk Board. Accordingly, the CSB has proposed to provide assistance to the

extent of Rs.14.71 cr. as Central Assistance and the balance amount of Rs.1.64 cr. has to be provided by the State Government. Under the package a sum of Rs.226.25 lakh, Rs.178.49 lakh, Rs.169.20 lakh and Rs.99.00 lakh have been released by CSB during 2002-03, 2003-04, 2004-05 and 2005-06 (Upto October '05), respectively. However, the expenditure under the J&K Special Package is being booked under Catalytic Development Programme.

Externally Aided Projects

i) **Japan International Cooperative Agency (JICA) Assisted Bivoltine Project**

The first phase of JICA assisted Bivoltine Sericulture Technology Development Project (BSTD) was implemented from 1991 to 1997. With the implementation of this project, a comprehensive practical Bivoltine Sericulture Technology suitable to Indian conditions had been developed.

In the second phase of JICA assistance, the Project for Promotion of Popularising the Practical Bivoltine Sericulture Technology (PPPBST) was implemented (1997-2002) with active participation by States of Karnataka, Andhra Pradesh and Tamil Nadu. The PPPBST Project activities entailed verification and demonstration of Bivoltine technologies developed in the first phase of the project with selected farmers, training of Indian sericulture technologists, technicians, field staff and farmers. The performance of these Bivoltine races matched international standards, with average yield over 60-80Kg/100Dfls, a renditta of 5.5 to 6 Kgs and a consistently high quality 2A-4A grade raw silk.

Encouraged by the results, the third phase of the Project on "Strengthening of Extension System for Bivoltine Sericulture" had commenced from August 2002 for a

period of five years, with a target to establish suitable extension and seed supply systems for promotion of bivoltine in the selected TSCs in Karnataka, Tamil Nadu and Andhra Pradesh and in CSB. The project is proceeding on schedule.

ii) **Chhatisgarh_Sericulture Project**

The Govt. of Chhatisgarh is implementing Chhatisgarh Sericulture Project with financial assistance from Japanese Bank for International Cooperation(JBIC). The project is proposed to be implemented in two phases – the first phase of the project for development of tasar culture over a period of 7 years and the second phase for development of mulberry sericulture over a period of further 5 years proposed to commence from the VIth year of the first phase of the project. Thus the project would be implemented over a period of 10 years at a total cost of Rs. 748.55 cr. The loan agreement for funding the first phase of the project was signed between OECF/ JBIC Japan and Govt. of India on 12.12.1997, which is effective from 05.02.1998.

iii) **Manipur Sericulture Project**

The Govt. of Manipur is implementing a "Manipur Sericulture Project" with financial assistance from JBIC, Japan. The project is to be implemented in two phases – the first phase for development of mulberry sericulture over a period of 7 years and the second phase for development of eri culture over a period of 5 years, proposed to commence after the 5th year of first phase of the project. Taking into consideration the implementation of stage I of the first phase, the Project was revised during the year and as per the revised action plan, raising 1700 ha of mulberry plantation by 5,000 beneficiaries, construction of 60 Chawki Rearing Centres and 4,000 Individual Adult Rearing Houses, 15 Technical Service

Centres, one Mulberry Industrial Grainage and one Post Cocoon Technology Training-cum-Production Centre, besides organizing Human Resource Development and Rehabilitation of Existing Facilities, at a revised cost of Rs.105.89 cr. are to be taken up during the next three years i.e. 2005-06 to 2007-08.

Convergence Projects

The CSB has adopted a convergence strategy to leverage funds and organizational capabilities for development of sericulture. By far the most successful has been the convergence with the programmes of the Ministry of Rural Development for creating sustainable infrastructure & livelihoods for persons below poverty line under the Special Swarnjayanti Gram Swarozgar Yojna (SGSY) projects. CSB lends its technical support & assistance to the States to draw up viable projects & to implement them, and in certain projects also pitches in with financial support.

Projects are being implemented with SGSY funds for development of all types of silks mainly non-mulberry silks i.e. muga, eri and tasar in the states of Assam, Arunachal Pradesh, Nagaland, Mizoram, Bihar and Jharkhand. The projects adopt a soil-to-market approach, and aim to increase host plant development, quality egg production and supply, training & skill upgradation, technological support in pre-cocoon & post cocoon process as well as market promotion with product design, development, diversification & product planning etc. The projects being implemented are

- Special SGSY project for development of Muga silk in Assam
- Special SGSY project for development of Eri silk in Assam
- Special SGSY project for

development of Muga silk in Arunachal Pradesh

- Special SGSY project for development of Eri silk in Arunachal Pradesh
- Special SGSY project for development of Eri silk in Nagaland
- Special SGSY project for development of mulberry sericulture in Mizoram
- Special SGSY projects for development of Tasar and Eri culture in Bihar and Jharkhand

A sum of Rs. 78.32 cr., including Central funding of Rs. 41.78 cr. has been attracted to the sericulture sector over & above the Xth Plan outlay. This is expected to generate 571.36 M.T. of silk and create 682573 lakh man years employment in sustainable activities in sericulture & silk industry.

Expansion of Sericulture in Non-Traditional Areas

For exploiting the vast potential available for development of sericulture in the non-traditional areas, CSB launched projects through the State Governments with financial & technical assistance under Catalytic Development Programme as below

- Project for development of Eri culture in Andhra Pradesh
- Project for development of Oak Tasar in Uttranchal
- Project for development of Oak Tasar in Manipur
- Introduction of Eri culture in Punjab
- R&D project on Eri culture in Tamil Nadu, Pondicherry and Kerala
- Introduction of Eri culture in Uttar Pradesh

- Project for Evaluation of nutritional potentials of eri silkworm pupae
- R&D project for Utilisation of Eri-pre-pupae/pupae by extraction of oil and surface waxes

The total cost of all the projects is Rs. 7.13 cr. which includes Central share of Rs. 3.45 cr.. The output is envisaged at 51.95 M.T.

Projects for Post Cocoon Technology Induction

CSB continues its efforts to increase productivity and quality of silk in the post cocoon sector through upgradation of technology & development and commercialization of low cost user friendly devices for reeling & spinning, cocoon drying etc. which have helped to reduce drudgery and increase efficiency, productivity and quality of produce. CSB has stepped up its financial and technical support for adoption and popularization of these technologies. The main projects includes-

IT Initiatives

I. Online Future Trading of Cocoons and Raw Silk

The Central Silk Board took the initiative to launch the Futures Trading in respect of silk cocoons and raw silk on the platform of National Commodity & Derivatives Exchange (NCDEX), Mumbai. Shri Shankersinh Vaghela, Hon'ble Minister of Textiles launched the facility on 20.01.2005. This alternate system of trading helps the trade through

1. Better price discovery
2. Cover against price fluctuations
3. Better market information
4. Quality based pricing
5. Transparent trading system

Under Futures Trading, Central Silk Board has taken up the responsibility of quality assaying services and conducting awareness programmes in the field. Accordingly, awareness programmes have been conducted in ten major silk clusters during the year. The initial response to this new concept of trading is not forth coming in view of the rigid state laws in the existing physical market. The absence of subjective quality based pricing is also coming in the way. Efforts are on to sort out some of these issues to make the concept of Futures Trading a success.

The Central Silk Board has also taken the initiative to register an association by name Silk Association for Futures Trading & E-commerce to facilitate the participation of primary stake holders of the sericulture industry in Futures Trading.

II. Database Development

The Central Silk Board has recently introduced Sericulture Information Kiosks providing useful information on Sericulture Technology and services for the benefit of the silk men especially farmers and reelers. Presently these kiosks have been deployed in Ramanagaram Cocoon Market, CSR&TI, Mysore, DOS Karnataka and Secretariat of Central Silk Board. These Kiosks work on Touch Screen Technology and the user friendly information is available in English and the regional languages. The language versions are prepared by keeping the regions specific requirement of the Industry. While the language versions of Tamil, Telugu, Malyalam are under deployment in key places of concerned States where sericulturists and reelers assemble in mass. Preparation of material in Hindi, Kashmiri and Bengali is in progress.

These kiosks provide information on Mulberry varieties, Silkworm races, Packages of practices, Diseases / pests

and their control measures, Seasonal fore warning, Post-Cocoon Technology, Training, Addresses of important officials, Marketing information etc. Apart from text, photographs and graphics, video clippings are also included in the kiosks. The feed back received for the kiosks is quiet encouraging and the users are finding it highly useful as they could access the required information at their finger tips. Kiosks, in fact, have opened up a new 'knowledge access' to the sericulture farmers and the reelers.

Quality Certification Systems

The scheme envisages to put in place Quality Certification System on voluntary basis in the following areas

1. Silkworm Seed Production;
2. Cocoon testing and grading;
3. Silk yarn testing and grading;
4. Testing of silk goods marked for exports and
5. Quality Certification for "Silk Mark Label".

This will ensure quality standards at different levels of production process that ultimately result in the production of quality silk yarn & fabrics of international standard, which can compete in the global markets.

Silk Mark Organization of India (SMOI)

The Silk Mark Organization of India (SMOI), a registered Society under the Karnataka Society Registration Act, sponsored by the Central Silk Board, has introduced the "Silk Mark Scheme" under the Quality Certification Systems. The broad objectives of the Silk Mark Scheme are – generic promotion of silk, consumer protection and promotion of Indian silk in export markets.

The Silk Mark has entered into operations during 2005-06. During 2005-06 (upto November, 2005) 108 new members were added to the Silk Mark Scheme and over 3,61,546 nos. of Silk Mark labeled products reached the market.

SMOI had participated in various exhibitions and conducted awareness programmes for consumers and trade across the country to promote the Silk Mark Scheme. During 2005-06 (up to Nov,05) SMOI had participated in as many as 16 exhibitions and conducted 15 awareness, 2 workshops and 2 interaction programmes.

Tribal Sub-Plan

The emphasis on creation of sustainable livelihood in the tribal area adapted to the tribal way of life, was carried forward with the thrust on non-mulberry silks. Projects in Chattisgarh, Jharkhand & the NER encourage sericulture on trees in forests & intercropped with agriculture produce and as a basket of subsistence & income augmenting activities. The major programmes being implanted by CSB are towards Research and Development and basic seed supply. Programme for specific target groups are implemented by the States.

The Indian Silk Export Promotion Council (ISEPC), Mumbai

The Indian Silk Export Promotion Council (ISEPC), Mumbai continues to undertake activities relating to promotion of exports of natural silk goods and acts as the registering authority for silk exporters. The Council produces and disseminates information to its members about market developments in the world, changes in the trade policies etc. through its monthly magazine "Silk Net". The silk sample catalogues containing sample

swatches of the full range of silks available in India brought out by the Council are available to potential buyer, importing textile agents and Indian Missions abroad.

Organization of 20th Congress of International Sericultural Commission (ISC) at Bangalore

The 20th Congress of International Sericultural Commission (ISC) was organized in India between 15-18.12.2005 at Bangalore. ISC is the triennial event and provides an international forum committed exclusively for sericulture sector. Its main

objectives are to encourage and promote sericulture and allied activities of sericulture industry through technology transfer, collaborative studies, scientific interaction, appraisal of sericulture projects for funding by agencies such as FAO, UNDP, World Bank, ADB etc. These measures would definitely assist in developing sericulture and silk industry in potential sericulture states of India. The intellectual discourse in silk and sericulture sector would certainly keep the scientists, students, institutions, traders and those concerned with the sericulture industry abreast with the latest knowledge/information in the field of sericulture and silk.