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ACTIVITIES OF CENTRAL SILK BOARD - HIGHLIGHTS

1

Silk industry – Performance

The highlights of the performance of Indian silk industry during 2016-17 are as follows:

- For the first time, the Indian Silk Industry has crossed 30,000 MT mark in terms of total raw silk production in 2016-17 and recorded a production of 30,348 MT as compared to 28,523 MT in 2015-16 indicating an annual increase of 6.4%.
- Out of the total raw silk production, mulberry sector contributed a total of 21,273 MT (Bivoltine (BV) - 5,266 MT and Cross Breed (CB) - 16,007 MT) as compared to 20,478 MT (BV - 4,613 MT and CB - 15,865 MT) in 2015-16.
- The production of import-substitute bivoltine mulberry silk recorded an impressive jump of 14.2% due to the joint efforts of CSB and state sericulture departments and keen involvement of farmers in growing bivoltine silk both in captive (seri-clusters) and non-captive areas.
- The Vanya sector, comprising Tasar, Eri and Muga silks, recorded a higher production of silk - 3268 MT (Tasar), 5637 MT (Eri) and 170 MT (Muga), producing a total of 9075 MT and recording a growth of 15.6%, 11.3% and 3.2%, respectively as compared to the last year.
- Fabrics, made-ups and readymade garments are the major items of India's silk exports, which account for about 91.5% of the total silk goods exports of the country. The industry, despite the global recession, managed an export earnings of Rs.2093.42 crore from silk and silk-goods.
- A total of 3795 MT of raw silk worth Rs.1092.26 crore was imported mainly from PR China, to supplement the domestic production for meeting the increasing demand.

RESEARCH & DEVELOPMENT

Mulberry Sector

Host Plant Improvement, Production and Protection

- Identified an improved mulberry variety 'G4' suitable for southern states, 'C-2038' for East and North-eastern India and 'Tr-23' for hilly areas through All India Co-ordinated Experiment Trials.
- Developed seven new triploid mulberry genotypes for East and North-eastern India with leaf yield potential ranging from 390 to 430 against 298g/plant/crop in control (S-1635).
- Identified 4 putative cold tolerant genes for improvement of mulberry genotypes.
- In order to popularize the newly developed mulberry variety 'PPR-1', a total of 4100 saplings were supplied to the Department of Sericulture, J&K to establish chawki-cum-nucleus seed cutting garden.
- DUS (Distinctiveness, Uniformity, Stability) guidelines for mulberry were developed, validated and incorporated into INDUS database.
- Field trial of 'Nemahari', a bio-nematicide showed an efficacy of 70-80% reduction in root knot disease and improved the leaf yield by 18-26%.

- A botanical based formulation 'Rot-*fix*', was developed to control root-rot disease in mulberry.
- Silk & Lac inter-crop Farming model was demonstrated successfully in Chamarajanagar (Karnataka) with a cost-benefit ratio of 1:2.06.
- Under Prime Minister's Soil Health Mission, Soil Health Cards were issued to about 10,800 sericulture farmers.
- A total of 1269 mulberry germplasm accessions (270 exotic and 999 indigenous) were conserved in the *ex situ* field gene bank.

Silkworm improvement, Production and Protection

- Two bivoltine hybrids *viz.,* CSR52N x CSR26N and (CSR52N x 8N) x (CSR16N x CSR26N) tolerant to BmNPV were developed.
- Authorization field trial of G11 x G19 with 5.00 lakh dfls in southern states showed an average cocoon yield of 68 kg/100 dfls with 2A-3A grade silk.
- A productive bivoltine single hybrid 'S8 x CSR16', characterized by higher shell (23.75%) and lower renditta (5.0-5.5), was developed and subsequent field trials yielded 73 kg cocoons/100 dfls in southern states.
- An Improved Cross Breed 'Cauvery Gold' (MV1 x S8) with an average cocoon yield of 70 kg/100 dfls and 6.5-7.0 renditta producing 2A grade silk was developed and tested in Karnataka and Andhra Pradesh.
- M6DPC x (SK6 x SK7) and B.Con.1 x B.Con.4 hybrids were tested under authorization trials and found to perform significantly better than the controls.
- The efficacy of the BmNPV resistant transgenic bivoltine hybrids developed through RNAi technique, CSR2 (T) x CSR4 and N (T) x (Sk6 x SK7) were evaluated under contained rearing conditions to generate data for regulatory approval.
- Six lines of RNAi based transgenic CSR4 and CSR27 were developed with 56% survival after BmNPV infection.
- The full-length genome of BmDNV was sequenced and *nsd-2* gene was used as marker for screening silkworm breeds towards developing disease resistant hybrids.
- On-station Trial of thermo-tolerant bivoltine hybrid TT2 x TT6, showed a higher survival (>90% pupation) and shell content (20-21%).
- Five each of Oval and Dumbbell shaped bivoltine breeds were evolved through shuttle breeding to develop robust hybrids for the tropical conditions.
- Automated Disinfection Technology was fine-tuned, validated and established at farmer's level with financial assistance from DoS, Karnataka.
- Vitellogenin Receptor (VgR) gene is validated as a functional marker for fecundity in silkworms.
- A cost-effective machine for folding and packing of the plastic mountages was developed.

Vanya Sector

Host Plant Improvement, Production and Protection

- Sixtytwo (62) F_1 hybrids were isolated for developing superior hybrids of *Terminalia*.
- Developed a package for moisture conservation and nutrient enrichment in *Terminalia* plantation that increases leaf yield up to 49%.

- Developed the package of practices for *Lagerstroemia speciosa* and silkworm rearing on this new host plant which are under field-testing.
- *Ailanthus grandis* (Borpat) with a leaf yield potential of 32 MT/ha/yr has been recommended as a primary host plant for the eri silkworm.
- 41,500 saplings of the high yielding Som morpho-types, S3 and S6 were supplied to the farmers.
- Soil fertility status of 800 soil samples from different Vanya host plant plots was assessed and Soil Health Cards (SHC) were issued with suitable recommendations.

Silkworm Improvement, Production and Protection

- Multi-locational field trials with CTR-14 showed high fecundity (260) and cocoon yield (76 cocoons/dfl) as compared to the control Daba (206 fecundity and 60 cocoons/dfl).
- Survey was conducted to record the wild tasar eco-races / populations and host-plant frequency in Suliapada forest range in Odisha.
- Special initiatives were taken to conserve Andhra Local eco-race through natural regeneration methods in Andhra Pradesh.
- Sarcosyl was found to be more effective in improving the clarity of smear of *Antheraea mylitta* for detecting *Nosema mylittensis* spores.
- Field evaluation of the newly developed eri silkworm promising hybrids *viz.,* YZ x YS and GBS x GBZ was undertaken.
- Five bacterial pathogens *viz., Lysinibacillus sphaericus*, *Serratia marcescens Enterococcus casseliflavus. L. fusiformis* and *Pseudomonas aeruginosa* infecting muga silkworm were characterized.
- A new chemical disinfectant for controlling bacterial flacherie disease in muga silkworm has been developed.
- Forecasting and forewarning system for pests and diseases of muga host plants and silkworm have been developed.

Post-cocoon Sector

- Sericin isolation technique from raw silk was standardized; isolated sericin was purified and characterized for cosmetic applications.
- For enhancing the quality of raw silk/twisted silk (silk skeins), pre-steaming technique was introduced and standardized, for twist setting.
- Hot-air drying technology was developed for tasar cocoons using conveyor-type hot-air dryer.
- Cooking technology for wet reeling of Raily tasar cocoons was developed along with optimization of other reeling parameters for reeling, instead of spinning.
- A bio-finish technique has been developed for tasar fabrics to significantly enhance the properties of fabric in terms of aesthetics and thermo-physiological comfort.
- Eri silk based non-woven fabric to be used as facial mask for cosmetic applications has been developed.
- Device for eri cocoon opening-cum-lap forming was designed to improve the productivity and quality of eri spun yarn.
- Easy-care finish for wash and wear applications on soft silk has been developed.
- 'Buniyaad' Reeling Machine has been fine-tuned to replace thigh reeling.
- 'Reeliboost' has been developed for improvement in cocoon reelability and quality of silk.

- Diversified products *viz.,* silk carpet with different knot structures (Persian, Tibetan & Turkish), Sericin-based soap & moisturizer, Eri-wool winter wear & stoles were developed.

TRANSFER OF TECHNOLOGY

- The technologies emanated out of the concluded projects have been effectively trans-ferred to the field through 4331 extension communication programmes *viz*., *Krishi melas*, group discussions, enlighten-ment programmes, field days, farmers' meet, audiovisual programmes, technology demonstrations etc.
- 46 technologies were transferred effectively to the user level under pre-cocoon sector.
- In post-cocoon sector, a total of 2291 field programmes/technology demonstrations were conducted and 107265 cocoon and silk samples were tested for quality parameters.
- Seri Agro Met advisories on pest & disease management were issued for adopting timely prophylactic measures.
- Necessary scientific advisories were extended to sericulture farmers using mKisan Web Portal.

Patents

- During the year, two patents were obtained for mulberry health drink 'Spoorthi' and Automatic Tasar Cocoon Separating Machine (Not holding).
- Further, patent applications were filed for the following:
  - Machine for cleaning and disinfection of rearing trays
  - Wet reeling machine for tasar sector
  - Two bobbin weft winding machines with 'pirn winding'
  - Improved less-friction Jacquard box for silk handloom
  - Reeliboost for improvement in cocoon reelability

Commercialization

- Machine for harvesting silkworm cocoons from plastic collapsible mountages.
- *'Ankush'* - an eco and user-friendly silkworm bed disinfectant.
- *'Poshan'* - a multi-nutrient formulation for correcting nutrient deficiencies in mulberry.
- 'Dr. Soil' - a formulation for improvement of soil fertility, mulberry leaf yield and silkworm cocoon yield.
- 'Rot-*fix'* -a product for control of root-rot disease in mulberry

CAPACITY BUILDING AND TRAINING

- Central Silk Board, a strong Capacity Building & Training organization, has covered a total of 16,690 industry stake-holders and CSB's in-house participants covering all the sub-sectors (mulberry, tasar, eri & muga) and activities on the silk value-chain. In addition, a total of 2275 college students and school children were exposed to sericulture.
- CSB conducts a 15-month PG Diploma course in Sericulture for i) Mulberry (CSR&TI, Berhampore) affiliated to Kalyani University, Kalyani and ii) Vanya (CTR&TI, Ranchi) affiliated to Ranchi University, Ranchi. During 2016-17, a total of 35 students out of 37 enrolled, successfully completed the course and 31 new students got enrolled.
- With a view to facilitate farmer–to-farmer contact for information sharing and tech-nology demonstration, 11 Sericulture Resource Centres (SRCs) were established in

different Seri-Clusters including North-eastern region.

- CSB organized Trainers' Orientation Programme in two batches covering around 50 officers/officials of ISDP project implementing teams from Manipur state under NERTPS programme.
- As a special initiative, two Faculty Development Programmes were organized for the first time this year, to the scientists/ faculties (50 No.) of CSB for updating their knowledge levels and session handling skills, one each at CTR&TI, Ranchi and CSR&TI, Berhampore, during February 2017.
- A total of 1383 farmers covering all the sub-sectors of silk were taken for exposure visit to developed sericulture clusters and R&D Centres to inspire them and broaden their horizon and knowledge levels.
- Under the new CSS component, Information Education and Communication (IEC) as many as three documentary films were produced, in addition to printing of several information brochures, technical documents, etc.
- A 'Centre of Excellence' primarily for post-cocoon technology was inaugurated by Smt. Smriti Zubin Irani, Hon'ble Union Minister of Textiles, Govt. of India on 20th December 2016 and was dedicated to the silk industry for capacity building and training.
- IGNOU in association with CSB conducts a six-month course – Certificate in Sericulture (CIS) since 2008. During the year, 67 new enrolments were made raising the total enrolments to 814 so far.

IT INITIATIVES

- Sericulture Information Linkages and Knowledge System (SILKS) portal has been developed in association with North Eastern Space Application Centre, Dept. of Space, Shillong by capturing geographical images through satellite and used for analysis and selection of potential areas for promoting sericulture activities in those areas.
- A database 'SERI-5K' has been designed and developed to maintain and manage the performance of cluster farmers producing bivoltine throughout the country.
- CSB, now is accepting online applications for various posts advertised, making it easy, effective and transparent for job aspirants to submit their applications. This will also lead to an efficient processing of applications on various parameters and complete the process in time.
- Aadhaar-enabled bio-metric attendance system is implemented at Central office, Bengaluru and 133 other nested field units.
- Database has been designed and developed for management of grievance and VIP references, digitalization of pension papers, etc.
- CSB has uploaded the details of 164 units in the web-portal *i.e.*, www.ncog.gov.in created by the Govt. of India for the purpose of centralized data bank of inventory of all government land.

SEED ORGANIZATION

The seed organizations of CSB under mulberry and *Vanya* (tasar, muga & eri) sectors have effectively contributed in supplying quality basic and commercial seeds to states and other agencies, for distribution among farmers resulting in reaching the silk production at desired level. National Silkworm Seed Organization (NSSO) of CSB has produced and distributed a total quantity

of 430.37 lakh dfls of commercial mulberry seed (bivoltine hybrids: 342.77 lakh dfls and cross breed: 87.60 lakh dfls). Similarly, vanya seed organizations (BTSSO, MSSO and ESSO) of CSB have produced and distributed a total quantity of 60.25 lakh dfls of basic seed (tasar: 48.60 lakh; muga: 6.87 lakh; eri: 4.78 lakh).

SPECIAL EVENTS

- Under the collaborative research project with Sericulture and Agriculture Experiment Station, Bulgaria for a period of 5 years from 2016, mulberry and silkworm genetic materials were procured, which are undergoing trials at Central Sericultural Research and Training Institute, Mysuru. The project aims to develop high yielding mulberry varieties and silkworm breeds suitable to both the countries.
- As a part of the agreement among the SAARC member countries, a joint collaborative project on sericulture sector comprising Bangladesh, Nepal and India is currently under preparation. In this connection, International Sericultural Commission has already undertaken an evaluation study in Bangladesh.

VISITS

- Shri Ananth Kumar, Hon'ble Union Minister of Chemicals & Fertilizers and Parliamentary Affairs inaugurated the Sericulture Stakeholders Meet on 20.08.2016 at the CSB Complex, Bengaluru. The occasion was also graced by Shri K.M. Hanumantharayappa, Chairman, CSB and Shri T.V. Maruthi, Chairman, Indian Silk Export Promotion Council.
- Launch of Indigenous Automatic Silk Reeling Machine and inauguration of Centre of Excellence for Training by Smt. Smriti Zubin Irani, Hon'ble Union Minister of Textiles on 20.12.2016 at CSB Complex, Bengaluru. Shri D.V. Sadananda Gowda, Union Minister of Statistics and Programme Implementation, Shri Ajay Tamta, Hon'ble Union Minister of State for Textiles, Members of Parliament, Board Members and officials from the Ministry of Textiles *viz.,* Secretary (Textiles) and Joint Secretary (Textiles) graced the occasion.

VISIT OF CSB OFFICERS TO OTHER COUNTRIES

1. A 5-member delegation led by Dr. H. Nagesh Prabhu, IFS, Member Secretary, Dr. Ajit Kumar Sinha, Director (CTRTI, Ranchi), Dr. Subhas V. Naik, Director (CSTRI, Bengaluru), Shri K.S. Gopal, Scientist-D & CEO, SMOI and Shri K.K. Shetty, Joint Secretary (Tech) attended the 24th International Congress on Sericulture and Silk Industry held at Bangkok, Thailand during August 14-16, 2016.
2. Dr. H. Nagesh Prabhu, IFS, Member Secretary, visited France as a member of the MoT delegation headed by the Hon'ble Union Minister of Textiles to participate in the “Who's Next Fair", a leading Fashion Trade Show organized from September 2 - 5, 2016 at *Porte de Versailles,* Paris.
3. A team of five officers comprising of Dr. Subhas V. Naik, Director, Shri S.R. Hippargi, Scientist-D, Shri M.A. Moon, Scientist-D, Shri Rudranna Gowda, Scientist-D and Shri Divakar Y. Bhat, Assistant Director (Insp.) were deputed to attend the international training / workshop on “Processing Technology and Innovation Design of Modern Silk Products” held at Xiasha Campus, Zhejiang Sci-Tech University, Hangzhou, PR China during October 12 - 26, 2016.
4. A team of CSB scientists comprising

Dr. V. Sivaprasad, Director and Dr. S. Manthira Moorthy, Scientist-D from CSR&TI, Mysuru and the investigative scientists under Indo-Bulgaria Collaborative Project visited Vratza, Bulgaria during October 17 - 21, 2016.

5. Dr. G. Ravikumar, Scientist-D, Seribiotech Research Laboratory, Kodathi was deputed to National Agriculture and Food Research Organization (NARO), Japan for a period of five days during January 12 - 16, 2017 under the lab-to-lab training programme.
6. Dr. V. Sivaprasad**,** Director, CSRTI, Mysuru was deputed to attend the 5th Asia-Pacific Congress on Sericulture and Insect Biotechnology (APSERI-2017) held at Bangkok during February 28 to March 2, 2017.
7. Dr. Kartik Neog, Scientist-D, CMERTI, Lahdoigarh was deputed to University of Tokyo, Japan for a period of 5 days from 6th to 10th March 2017 to undergo an exposure training in the Laboratory of Insect Genetics, School of Agricultural and Life sciences, Tokyo.

AWARDS

- **Rajbhasha Regional Award:** Two nested units of CSB *viz.,* Regional Office, Bhubaneswar and Certification Centre, Varanasi were awarded first prizes for excellence in Implementation of Official languages. Three other offices each were also awarded 2nd and 3rd prizes during 2016-17.
- **CSB Awards 2016:** On the occasion of CSB Foundation Day celebration, newly constituted CSB Awards for Excellence in various disciplines were given. The list of categories and award winners are as follows:

Sl. No.	Category	Awardees
1	Best Multi-Tasking staff	Shri K. Ganapathy, Regional Office, Chennai
2	Best Driver	Shri Ejaz Ahmed, Central Office, Bengaluru
3	Best Admn. & Accts employee	Shri V. Sreekumar, UDC, SSPC, Palakkad
4	Best contribution towards Official Language	Shri Vijoy Kumar, Assistant Director [Official Language], CSTRI, Bengaluru
5	Best Technical Cadre employee	Shri R.K. Sinha, Assistant Secretary, (Tech.) RO, New Delhi
6	Best Skilled Farm Worker, Mulberry	Shri Prashanta Haldar, CSRTI, Berhampore
7	Best Technical Support Staff [STA]	Shri K.N. Nandi, STA, SSC, Haveri
8	Best Technical Support Staff [TA,FA,SFA]	Shri C.Venugopal Nair, TA, Central Office, Bengaluru
9	Best R&D Scientist [Mulberry	Dr. Balavenkatasubbaiah, Scientist-D, CSRTI, Mysuru

Sl. No.	Category	Awardee
10	Best R&D Scientist [Vanya]	Dr. Karthik Neog, Scientist-D, CMERTI, Lahdoigarh
11	Best R&D Scientist [Training & Extension] Mulberry	Dr. T. Mogili, Scientist-D, CSR&TI, Mysuru
12	Best R&D Scientist [Training & Extension] Vanya	Dr. V.P. Gupta, Scientist-D, CTRTI, Ranchi
13	Best R&D Scientist [Seed] Mulberry	Shri Somi Reddy, Scientist-D, NSSO, Bengaluru
14	Best R&D Scientist [Seed] Vanya	Dr. Debasish Das, Scientist-D, BSM&TC, Bilaspur
15	Best R&D Scientist [Post-cocoon]	Shri K.M. Abdul Khadar, Scientist-D,CSTRI, Bengaluru
16	Best Overall Performance	Shri K.K. Shetty, Joint Secretary [Tech], Central Office, Bengaluru

FUNCTIONS AND ORGANIZATIONAL SET UP

2

Introduction

Central Silk Board (CSB), constituted in April, 1949, by an Act of Parliament (Act No.LXI of 1948), is a statutory body under the Ministry of Textiles, Government of India, established for the development of sericulture and silk industry in the country. It is under the administrative control of the Ministry of Textiles, Government of India and is an apex agency to oversee the growth and development of silk industry in India. The vision of CSB is to *"See India emerge as the global silk leader"* and aligned to this vision statement, the Board has planned its programmes and strategies for all the three distinct sectors *viz.*,

a. Silkworm Seed production,
b. Farm sector/Pre-cocoon sector and
c. Industry or Post-cocoon sector.

The focus of sericulture sector during 2016-17, among other priorities, was to boost up the production of quality BV mulberry raw silk. Since all the major developmental schemes of XII Five Year Plan (Catalytic Development Programme & Central Sector Scheme) were primarily front-loaded in nature during the first three years (2012-13 to 2014-15), the last two years 2015-16 and 2016-17 had been basically the years of consolidation in which all the developmental schemes were reviewed for progress / achievement and documentation.

The activities of CSB include research and development, front line demonstration, maintenance of four-tier silkworm seed production network, leadership role in commercial silkworm seed production, standardizing and instilling quality parameters in various production processes, promoting Indian silk in domestic and international markets and advising the Union Government on all matters concerning sericulture and silk industry. A network of 306 units of CSB located in different states is carrying out these activities. The details of the CSB Secretariat and its units are at Annexure – I (a & b).

Functions

CSB coordinates and assists in:

- Promotion of the development of silk industry by such measures as it thinks fit.
- Undertaking, assisting and encouraging scientific, technological and economic research in sericulture and silk sectors.
- Production of basic and commercial silk-worm seed for supplementary assistance to various states.
- Improvement of raw silk marketing and brand promotion.
- Advising the central government on all matters relating to the development of silk industry including import and export of raw silk.
- Collection of sericulture statistics from various states.
- Preparation of reports related to silk industry for Ministry of Textiles, Government of India.

Constitution of the Board

CSB is constituted by 39 members appointed as per the powers and provisions conferred by Sub-Section-3 of Section-4 of the CSB Act 1948, for a period of 3 years. The new members nominated during 2016-17 are detailed in Table 2.1.

Table 2.1: New members nominated during 2016-17

Sl. No.	Name & designation of nominated members	Period of nomination	Notification details
1	Shri K.M. Hanumantharayappa, Chairman, CSB	08.08.2016 to 07.08.2019	25012/67/99-Silk dated 05.08.2016 under Section 4(3)(a)
2	The Director, Handloom, Sericulture and Handicrafts, Department of Industries, Govt. of Jharkhand, Ranchi	02.06.2016 to 01.06.2019	25012/7/2014-Silk dated.02.06.2016 under Section 4(3)(g)
3	The Director Directorate of Sericulture, Govt. of Uttarakhand, Dehradun	02.06.2016 to 01.06.2019	25012/7/2014-Silk dated.02.06.2016 under Section 4(3)(g)
4	The Director of Sericulture, Government of Manipur, Imphal	02.06.2016 to 01.06.2019	25012/7/2014-Silk dated.02.06.2016 under Section 4(3)(g)
5	The Deputy Director of Industries (Seri), Directorate of Industries, Udyog Bhavan, Shimla, Himachal Pradesh.	02.06.2016 to 01.06.2019	25012/7/2014-Silk dated.02.06.2016 under Section 4(3)(g)
6	Shri Shyam Lal Dhawde, Director, Directorate of Rural Industries (Sericulture Sector), Government of Chhattisgarh, New Raipur, Chhattisgarh.	16.09.2016 to 15.09.2019	25012/7/2014-Silk dated.16.09.2016 under Section 4(3)(g)
7	Shri Janab Mohammad Sohrab, S/o Late Yar Mohammad, Village Mongolian, P.O. Charsale, P.S. Raghunathganj – 742 225 Dist. Murshidabad, West Bengal.	17.03.2017 to 16.03.2020	25012/4/2017-Silk dated.17.03.2017 under Section 4(3)(f)

Shri Puneet Agarwal, IAS, Joint Secretary, MoT, New Delhi has taken charge as Joint Secretary (Silk), MoT, New Delhi and Vice-Chairman, CSB w.e.f. 25.10.2016 in place of Ms. Sunaina Tomar, IAS. A list of Members of the Board as on 31.03.2017 under different sections is at Annexure –II.

Changes in Senior Level Officers

CSB has filled the vacancies at the level of Directors of Research Institutes, as a part of its administrative and financial responsibility for smooth conduct of the sericulture developmental activities. During the period under report, the following Directors have taken over charge:

- Dr. Ajit Kumar Sinha assumed charge of the Director at Central Tasar Research & Training Institute, Ranchi on 01.04.2016
- Dr. B.K. Singh assumed the charge of the Director, Central Muga Eri Research and Training Institute, Lahdoigarh on 15.04.2016.
- Dr. Pradeep Kumar Mishra assumed charge of the Director (Tech) at the CSB Secretariat, Bengaluru on 15.04.2016.
- Shri Brojendra Choudhury, Scientist-D assumed the charge as Head at Muga Silkworm

Seed Organization, Guwahati (Assam) on 02.06.2016

- Dr. Kalidas Mandal has taken over the charge of BTSSO, Bilaspur as Director on 17.10.2016.
- Dr. M.K. Ghosh, assumed the charge of the Director, Central Sericultural Research & Training Institute, Pampore on 23.01.2017.
- Dr. R.K. Mishra assumed the charge of the Director, National Silkworm Seed Organization, Bengaluru on 31.01.2017.
- Consequent upon superannuation of Dr. Pradeep Kumar Mishra, Dr. R.K. Mishra took over the charge of the post of Director (Tech) at CSB Secretariat, Bengaluru on 06.02.2017.
- Dr. Alok Sahay assumed charge of the Director, Basic Tasar Silkworm Seed Organization, Bilaspur on 10.02.2017.
- Consequent upon transfer of Dr. R.K. Mishra as Director, NSSO, Dr. Kalidas Mandal took over the charge of Director (Tech), CSB Secretariat, Bengaluru on 13.02.2017 along with additional charge of Seri-Biotech Research Laboratory, Kodathi, Bengaluru.
- Dr. (Mrs.) Gargi, Scientist-D assumed the charge of the Director, Central Sericulture Germplasm Resources Centre, Hosur, Tamil Nadu on 20.02.2017.

Staff Strength

The Group-wise sanctioned strength and working strength of the CSB as on 31st March, 2017 is indicated in Table 2.2.

The Board has recruited 129 officers and staff in different categories (Group-A-4, B-11 and C-114) against existing vacancies. During the same period, 223 officers and staff in different categories (Group A-81, B-70 and C-72) superannuated from the Board's services.

Table 2.2: Central Silk Board Staff Strength as on 31.3.2017

Group	Sanctioned	Filled	Gen	SC	ST	OBC	PWD	TOTAL
A	811	609	365	126	53	63	2	609
B	1461	1311	841	248	125	79	18	1311
C	1583	1232	610	338	161	107	16	1232
D	2	2	-	2	-	-	-	2
Total	**3857**	**3154**	**1816**	**714**	**339**	**249**	**36**	**3154**
%			57.58	22.64	10.75	7.89	1.14	100

Meetings of the Board and Standing Committee

During the period, two Board Meetings were conducted, one each at Srinagar (J&K) on 25.05.2016 and at Bengaluru on 15.02.2017. Two Standing Committee meetings were also conducted on 09.09.2016 and 15.02.2017 at Bengaluru.

Implementation of Reservation Policy

The CSB has been following the reservation policy as per the directions of Government of India for persons belonging to Scheduled Castes, Scheduled Tribes and Other Backward Classes under direct recruitment and for promotion also. Apart from the above, the reservation policy is also extended to the Persons with Disabilities for direct recruitment in all groups and for promotion under Group 'C' category under the Equal Opportunities, Protection of Rights and Full Participation Act, 1995 of Government of India.

Vigilance

Measures needed to strengthen the preventive vigilance by streamlining procedures to select units of the CSB considered sensitive were

identified and suitable measures taken. Besides, the part-time Chief Vigilance Officer of the CSB, the Directors/Officers-In-Charge of the CSB stationed at different zones have been entrusted with the task of carrying out surprise inspections of the units/sensitive areas, clearly demarcating their areas of jurisdiction. The inspection reports received were invariably scrutinized and action taken wherever necessary. However, during 2016-17, there arose no necessity to initiate any disciplinary proceeding based on such reports. An Internal Audit Wing supported by Zonal Audit Teams of different zones has been functioning to conduct the internal audit on the accounts of the units. The Directors of the research institutes/ research stations and the officers of the rank of Scientist-D holding independent charge of the various units were delegated with powers to function as Disciplinary Authority in respect of certain categories of officials. The complaints and petitions received were examined and action taken as and when a *prima facie* case was established. During the period under reference, 24 complaints were received, of which 21 disposed off and three are pending.

Expediting the completion of Preliminary Investigations / Oral Inquiries: Preliminary investigations, wherever ordered, were carried out as early as possible and action is being taken on the findings of the Preliminary Investigation Officers. As on 31-03-2017, five disciplinary cases were pending for disposal. For the disciplinary cases initiated in CSB under Rule 14 of Central Civil Services (Classification, Control and Appeal) Rules, 1965, *viz.,* major penalty proceedings, serving as well as retired officers of the CSB are being appointed as the Inquiry Officers, with instructions to complete the inquiry process within the specified time limit. Five Retired Judicial Officers (Retired District Sessions Judges) have been empaneled, to act as the Inquiry Officers for the disciplinary cases.

Sexual harassment at work place complaints: As regards the complaints relating to sexual harassment at work places received from the women employees / women farm workers of the CSB, Complaint Committees have been constituted at the Secretariat as well as at the institutes' level to act as Inquiry Authority.

Observance of the Vigilance Awareness Week: In accordance with the guidelines issued by the Ministry / Central Vigilance Commission, New Delhi, a Vigilance Awareness Week was observed at the CSB Secretariat and at all its subordinate units between 31-10-2016 and 05-11-2016 in a befitting manner.

Implementation of Right to Information Act, 2005: Forty CPIOs and 215 APIOs have been designated at CSB Secretariat and field units. The Public Information Cell has received 162 applications from the public during the year, of which 21 applications were pending for disposal as on 31st March, 2017. Seven appeals were also received and disposed by 31st March, 2017. Copies of applications received and replies furnished to the citizen were uploaded in CSB's website www.csb.gov.in.

Parliament Related Matters

a. Furnished reply material for Parliament questions: During 2016-17, CSB had furnished reply materials for 114 Parliamentary questions (Lok Sabha: 85 and Rajya Sabha: 29) that were related to Ministry of Textiles, as per the break-up given in Table 2.3.

Table 2.3: Replies Furnished to Parliament questions

House of Parliament	Budget session April 2016-17	Monsoon Session July-Aug 2016	Winter Session Nov-Dec 2016	Budget session March 2017-18	Total
Lok Sabha	19	15	25	26	85
Rajya Sabha	4	10	7	8	29
Total	**23**	**25**	**32**	**34**	**114**

b. Parliamentary Committee Meetings: Parliamentary Committee on Papers Laid on the Table, Rajya Sabha visited Bengaluru on 29th September, 2016 for an interaction review meeting with the Officers of the MoT and CSB and held discussions on the progress of CSB during the meeting held at Bengaluru.

c. Inspection of Parliamentary Committee on Official Languages: The Third Sub-Committee of Parliamentary Committee on Official Languages visited Central Sericulture Research & Training Institute, CSB, Pampore (J&K) on 11.06.2016.

Review Meetings with Secretary (Textiles)/ MOT

During 2016-17, MoT conducted 4 review meetings with CSB's Senior Officers /Scientists on 27.04.2016, 01.06.2016, 26.10.2016 and 30.11.2016 at New Delhi which were attended by the Member Secretary, CSB and other Senior Officers/ Scientists.

Anti-dumping Duty on Chinese raw silk and silk fabrics

Raw Silk: With a view to protect the interest of domestic silk industry, CSB had filed a petition with the Director General of Anti-Dumping and Allied Duties (DGAD) on 8th May 2014 for considering imposition of anti-dumping duty on raw silk of 3A grade and below originating in or exported from China PR. The DGAD, after detailed investigation of the petition, has announced the final findings recommending imposition of definitive anti-dumping duty in the form of fixed duty of US$ 1.85 per kg on Chinese raw silk of 3A grade and below vide their Notification No. 14/17/2014/DGAD dated 04.12.2015. The duty so imposed is for a period of five years and is in force until December 2020.

Silk Fabric: The anti-dumping duty imposed on Chinese silk fabrics with weight ranging from 20-100 gm/mtr indicating a reference price of US$ 2.08 - 7.59/mtr w.e.f. December 2011 was in force until December 2016. The Weavers Associations have approached CSB/MOT for continued imposition of anti-dumping duty on Chinese silk fabrics. However, CSB is in the process of evaluation of prices of Chinese silk fabrics and Indian domestic silk fabrics for a period of 6 months after closure of anti-dumping duty to understand the likely dumping by Chinese exporters and to take call on filing a fresh petition before DGAD.

Customs Duty on Import of Raw Silk: A basic customs duty of 10% on imported raw silk was in force during 2016-17.

3

PROJECTS & SCHEMES

CENTRAL SECTOR SCHEMES

The CSB is implementing a Central Sector Plan Scheme entitled "Integrated Scheme for the Development of Silk Industry (ISDSI)" aimed to increase the quality and productivity of silk, thereby enhance the income of the stakeholders. The scheme consists of following four components:

A. Research & development, training, transfer of technology and IT initiatives
B. Seed organization
C. Coordination and market development
D. Quality certification system

A. Research and Development, training, transfer of technology and IT initiatives

The research & development institutes of CSB are striving continuously to provide scientific and technical support to the sericulture sector to meet the challenges posed by global warming, international competition, urbanization, outbreak of new pests and diseases, generation of employment and enhancement of income. During the last couple of years, silk production in the country has recorded a remarkable growth, both qualitatively and quantitatively. The bivoltine silk production has broken all previous records and rose beyond 5,000 MT to meet the domestic demand. The innovations made in the post-cocoon sector have taken the indigenous/domestic silk quality to a new height, besides, enhancing the productivity.

The main institutes located at Mysuru (Karnataka), Berhampore (West Bengal) and Pampore (J&K) deal with mulberry sericulture whereas Ranchi (Jharkhand) with tasar culture and Lahdoigarh, Jorhat (Assam) with muga & eri cultures. Regional Sericultural Research Stations for mulberry and vanya sericulture have been functioning for the development of region-specific technology package and dissemination of research findings as per regional needs. Besides, a network of Research Extension Centres (RECs) and their sub-units for mulberry and vanya silks are also functioning to provide extension support to sericulturists. The Central Silk Technological Research Institute (CSTRI) located at Bengaluru provides R&D support in post-cocoon sector. Similarly, Silkworm Seed Technology Laboratory (SSTL), Bengaluru (Karnataka) delivers support to seed sector, Central Sericultural Germplasm Resource Centre (CSGRC) at Hosur (Tamil Nadu) helps in maintaining the genetic resources of both mulberry silkworm and its host plant, while Seribiotech Research Laboratory (SBRL) at Bengaluru carries out bio-technological research in sericulture domain.

Central Sericultural Research and Training Institute (CSR&TI), Mysuru (Karnataka)

The R&D programmes undertaken in mulberry and silkworm breeding, crop production and protection by CSR&TI, Mysuru have resulted in developing technologies suitable for the needs of mulberry sericulture farmers in the states of Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Telangana, Maharastra and Madhya Pradesh. The institute also undertakes extension and training activities for effective transfer of technologies. The major achievements are as follows:

Mulberry Crop Improvement, Production and Protection

- The mulberry variety G4 performed well in the All India Coordinated Experimental Trials conducted in South India.
- DUS (Distinctiveness, Uniformity and Stability) guidelines for mulberry were developed, validated with forty-three example varieties and published with the approval of the Protection of Plant Varieties and Farmers' Rights Authority, New Delhi and the database was incorporated into INDUS.
- Mapping population for root rot resistance, utilizing divergent genotypes was developed.
- 'Rot-fix', a new formulation of botanicals was developed against root rot disease.
- 'Nemahari', a bio-nematicide was evaluated in the field for the management of root knot disease caused by *Meloidogyne incognita* with an efficacy of 70-80% reduction in root knot to improve the leaf yield by 18-26%.
- Affordable Micro-Irrigation Technology (AMIT) was established with IVLP farmers in Chamarajanagar (Karnataka) for tree mulberry cultivation under wider spacing, utilizing moisture stress-tolerant variety (S13).
- Silk and Lac intercropping farming model was demonstrated successfully in Chamarajanagar (Karnataka) with a cost-benefit ratio of 1:2.06 and an additional income of Rs.46,750/-.
- Tree mulberry cultivation practice was popularized in water-stress areas of Karnataka, Andhra Pradesh, Telangana, Maharashtra and Tamil Nadu with G4, S13 and V1 varieties. Audio-visuals on tree mulberry cultivation, irrigation and canopy management was developed.
- Soil health cards were issued to 10,007 sericulture farmers in Karnataka, Andhra Pradesh, Telangana, Maharashtra, Madhya Pradesh and Tamil Nadu under PM's Soil Health Mission.
- 6450 acres of mulberry plantation was developed with 5,000 farmers through RSRS's and their extension units.
- Seed gardens of G2, G4, MSG2 and AGB8 were established for popularizing new mulberry varieties.

Silkworm Crop Improvement, Production and Protection

- Authorization trial of G11 x G19, a bivoltine double hybrid, was completed with 5 lakh dfls in the field and an average yield of 68 kg/100 dfls with 2A-3A graded silk recorded in Andhra Pradesh, Karnataka, Tamil Nadu, Telangana and Maharashtra.
- Two bivoltine hybrids CSR52N x CSR26N and (CSR52N x 8N) x (CSR16N x CSR26N)) tolerant to BmNPV were developed.
- Four new bivoltine hybrids superior to the existing popular commercial bivoltine hybrids were developed with robustness (SHR1 and DHR4) and higher productivity (SHP2 and DHP5).
- The transgenic bivoltine hybrid, CSR2 (T) x CSR4, tolerant to BmNPV developed through RNAi technique, was evaluated under controlled rearing conditions to assess the efficacy of the transgene and generate data for regulatory approval.
- Five bivoltine pure breeds and 2 hybrids were procured from Sericulture and Agriculture Experiment Station (SAES), Bulgaria for development of commercial hybrid silkworms suiting to tropical condition.
- Outstation trial of improved crossbreeds (L3 x

S8 and HB4 x S8) tolerant to high temperature and BmNPV resistance showed >90% pupation, 20-21% cocoon shell and 14-15% raw silk.

- 35 bivoltine double hybrids exhibiting tolerance to high temperature and high humidity were short-listed through hot-spot evaluation of 77 hybrids in the coastal regions of Andhra Pradesh and Tamil Nadu.
- S8 x CSR16, a productive bivoltine single hybrid, in the field evaluation recorded an average yield of 73.38 kg/100 dfls in Andhra Pradesh, Karnataka and Tamil Nadu covering 57900 dfls. The hybrid is characterized by higher shell content (23.75%) and lower renditta (5.0-5.5).
- Field-testing with 16500 dfls of SSBS5 x SSBS6 demonstrated an average yield of 70-75kg/100 dfls in Tamil Nadu.
- A new Improved cross breed 'Cauvery Gold' (MV1 x S8) was developed and tested in Karnataka and Andhra Pradesh. Data of 62,300 dfls showed an average cocoon yield of 70 kg/100 dfls which produced 2A grade silk with 6.5-7.0 renditta.
- On station trial of newly developed thermo-tolerant bivoltine hybrids showed that TT2 x TT6 performed better for higher survival (>90% pupation) and shell content (20-21%) as compared to control.
- Sex pheromone, Tricosene was found effective in attracting the uzifly (*Exorista bombycis*) in association with two minor compounds (Tricosane and Pentacosan) through water pan trap.
- Automated Disinfection Technology (ADT) was fine-tuned and validated successfully (70.5 kg cocoon yield/100 dfls) in RSRSs of CSRTI, Mysuru. The ADT units were also installed with 44 farmers through financial assistance from DoS, Karnataka.
- A prototype machine for collection of dust in Silkworm Seed Production Centres (SSPCs) was developed for improving the working atmosphere in grainages.

Patents and Commercialization

- Patent was obtained for '*Spoorthi*', a mulberry health drink.
- Patent application was filed for the machine used for cleaning and disinfection of rearing trays (Patent App. No. 201641029413-29.08.2016).
- A machine for harvesting silkworm cocoons from plastic collapsible mountages was commercialized through M/s. MAG Solvics Private Limited, Coimbatore.
- Ankush - an eco and user-friendly silkworm body and rearing seat disinfectant was commercialized through M/s. Bhopal Bleach Private Limited, Bhopal.
- Poshan - a multi-nutrient formulation for correcting nutrient deficiencies in mulberry was commercialized through M/s. Linga Chemicals, Madurai.
- Dr. Soil - a formulation for improvement of soil fertility, mulberry leaf yield and silkworm cocoon yield was developed in association with M/s. Microbi Agrotech Private Ltd., Bengaluru.
- Rot-fix - a product for control of root rot disease in mulberry, was developed and is being commercialized through NRDC.

Central Sericultural Research and Training Institute, Berhampore (West Bengal)

Central Sericultural Research & Training Institute, Berhampore along with its three Regional Sericultural Research Stations (RSRSs) and 14 Research Extension Centres (RECs) and Sub-RECs, has made significant contributions for

the development of sericulture industry in the eastern and North-eastern regions. The research and development focus was mainly on prioritized needs of regional requirements, extension and human resource development for benefiting the sericulture stakeholders, in close coordination with Directorates of Sericulture/Industries in eastern (5) and North-eastern (8) states. For long, West Bengal along with the eastern part of the country was known as non-congenial zone for bivoltine sericulture due to unfavourable climate, but overcoming all hindrances, bivoltine sericulture has gained momentum due to tireless efforts of R & D and extension machineries. Major achievements made during the year are as follows:

Mulberry Crop Improvement, Production and Protection

- C-2038 has yielded 53.8 ha/yr and 17-21 MT/ha/yr, respectively in irrigated and rainfed conditions and Tr-23 in hilly areas with a leaf yield of 10-12 MT/ha/yr out yielded all other varieties including their respective controls in the All India Co-ordinated Experimental Trial for mulberry.
- 1024 hybrids of mulberry were evaluated at progeny row trial for morpho-physiological parameters and 24 hybrids with high leaf yield (2.104 to 2.561 kg/plant/yr) were short-listed over the control variety S-1635 (1.620 kg/plant/yr).
- Evaluation of 7 mulberry varieties suitable for less fertile soil showed the highest leaf yield in C-9 *i.e.,* 52.81 MT and 34.11 MT/ha/yr, in full and 50% fertilizer doses respectively, which indicated better fertilizer use efficiency and responsiveness under irrigated condition.
- Seven new triploid mulberry genotypes with leaf yield ranging from 391 to 433 g/plant/crop were short-listed based on their performance in comparison with the ruling variety S-1635 (298 g/plant/crop) for evaluation under Final Yield Trial (FYT).
- Studies on leaf yield data of high bush and tree type mulberry plantation under rainfed conditions of Odisha showed the highest leaf yield of 4.46 MT, 3.3 MT and 2.12 MT per ha/yr in S1635 at a spacing of 5' x 5', 6' x 6' and 8' x 8', respectively.
- Eight promising mulberry progenies were evaluated for powdery mildew resistance under FYT. Three lines exhibited 16 to 26% higher leaf yield with significant disease resistance over ruling cultivar S-1635, where as, four putative PM responsive SCAR and SSR markers showed ≥76% correlation with the phenotypic disease reaction by the progenies.
- The integrated pest management modules were developed and upgraded for silkworm and mulberry pests of 13 eastern and north-eastern states of India. Weather based prediction/ forecasting models were upgraded to avert crop losses in the changing climatic scenario.
- Under the study of root rot disease of mulberry, the growth of *Fusarium solani* was observed under in vitro condition in Petri plates. Application of bio-fungicide *Trichoderma viride* controlled 66.22% growth and application of SAAF (Carbendazim 12% + Mancozeb 63%) recorded 94% growth inhibition.
- Moderate tillage with grass cover, FYM / rearing waste compost at 20 MT/ha/yr along with soil test-based NPK fertilizers under irrigated condition to reduce the mulberry foliage production cost, sustained high productivity and quality mulberry leaves through terrestrial carbon sequestration was recommended. This method resulted in

production of 38.7 MT/ha/yr of leaf, 6.9 MT/ha/yr of Carbon Sequestration and 40.1 mg/ha/yr Soil Organic Carbon Stock (SOCS).

Silkworm Improvement and Production and Protection

- Seven multivoltine lines with high SR (> 17%) and high neatness (>80 points) *viz.,* M.Con.1 x MH1 (M1)-White; M.Con.4 x MH1 (M2)-Yellow; Nistari x MH1 (M3) -Yellow; Gen3 x M.Con.4 [M4] -Yellow; (Sk6 x SK7) x M.Con.4 (M5) -Yellow; M6DPE x MH1 (M6) -Yellow and MH1 x BHB (M7) -White have been developed.
- Two 6-way bivoltine converged gene pool for high shell weight and three multivoltine converged gene pool for high survival have been developed.
- Five each of oval and dumbbell shaped breeds were developed through shuttle breeding at different locations *viz.,* CSRTI, Berhampore; RSRS, Kalimpong; RSRS, Koraput; RSRS, Jorhat; REC, Bhandra and REC, Shilong.
- Under authorization trial of silkworm hybrids**,** 56200 dfls of M6DPC x (SK6 x SK7) and 99800 dfls of B.Con.1 x B.Con.4 were tested along with respective control hybrid and found that the test hybrids performed significantly better than the controls.
- Six proteins with molecular weight 10, 15, 24, 40, 45 and 50 KDa were purified from silkworm challenged with pathogenic bacteria, sequenced and showed homology to anti-bacterial proteins for use as a source material for cloning.
- An easy to handle, durable and cost-effective machine was developed for folding and packing the plastic mountages.
- 'Reeliboost' Surface Active Agent (SAA)' and 'Wetting Agent (WA)' were developed for improvement in cocoon reelability (5-15%) as well as quality silk production with low investment.

Patenting and Commercialization

- Applied for patenting of 'Reeliboost' that helps in improving the cocoon reelability.

Central Sericultural Research and Training Institute, Pampore (J&K)

Central Sericultural Research and Training Institute, Pampore is catering to the sericulture needs in North and North-western parts of India. It has a wide network of 3 RSRSs and 18 Research Extension Centres, across 7 North-western states. Major achievements during 2016-17 are as follows:

Mulberry Crop Improvement, Production and Protection

- Two new mulberry varieties (C2038 and Tr-23) were identified for sub-tropical conditions of Jammu and Uttarakhand, respectively out of the concluded AICEM-III studies.
- Four putative cold tolerant gene sequences of ICE1 (Inducer of CBF expression 1), ESKIMO1, Dehydrin, DREB1C from *Morus notabilis we*re identified for improvement of mulberry genotypes.
- Plantlets of PPR-1, Ichinose, Chinese White and Goshoerami were successfully raised through plant tissue culture technique. Their acclimatization studies are under progress.
- Popularization of new mulberry variety PPR-1 was continued and 4,100 saplings were supplied to Department of Sericulture, J&K (Kashmir region) to establish chawki-cum-nucleus seed cutting garden.
- Among the 20 mulberry accessions analyzed

for biochemical parameters, mulberry accession collection from Saspol (Leh, Ladakh) and ME-53 showed higher concentrations of proteins, while China 31 and collection from Gurez (J&K) showed higher concentrations of chlorophyll compared to other mulberry accessions.

- The incidence of root rot was 11.32%, 9.27% and 14.16% in South, Central and North Kashmir, respectively and the incidence was higher in irrigated condition as compared to rainfed. The incidence was highest in Chinese White within the age group of 0-2 years.
- 162 temperate mulberry germplasm accessions were maintained at Pampore (80), P4 Basic Seed Farm, Manasbal (82), and 100 sub-tropical germplasm accessions at Sahaspur (82) and at RSRS, Jammu (18).
- 60 exotic mulberry accessions were raised through bud grafting technique at Pampore and 50 mulberry accessions were established at RSRS, Sahaspur under safety back-up programme.

Silkworm Crop Improvement, Production and Protection

- In silkworm improvement programme, the highest ERR/10,000 larvae by number (9733) and weight (15.25 kg) was recorded in line-4 (APS-9 x Pam-114) and absolute silk content (3.14 kg) was recorded in line-3 (APS-9 x PSO-4) in F8 generation.
- The hybrid Pam (DR)-1 x Pam (DR)-18 recorded the highest pupation rate (93.40%) among 20 hybrids tested during summer 2016 at CSR&TI, Pampore, whereas during Autumn 2016, hybrid Pam (DR)-9 x Pam (DR)-16 showed the highest pupation rate (94.53%) at CSR&TI, Pampore.
- The test trials of transgenic silkworm hybrid yielded 60 kg cocoons /100 dfls as against 59 kg in control.
- 165 temperate silkworm germplasm accessions were maintained at the Institute and 54 sub-tropical germplasm accessions at RSRS, Sahaspur.
- The observations with 150 farmers from South, Central and North Kashmir zone revealed that the incidence percentage of grasserie disease and extent of crop loss was highest in South Kashmir followed by Central and North Kashmir.

Central Sericultural Germplasm Resources Centre, Hosur (Tamil Nadu)

Central Sericultural Germplasm Resources Centre, Hosur, Tamil Nadu was established in 1990 to act as a national nodal center for conservation of sericultural germplasm in the country. Over the years, it has gained prominence and emerged as premier germplasm institute in India committed to overall conservation of seribiodiversity for posterity and duly recognized by National Bureau of Plant Genetic Resources (NBPGR), New Delhi and National Bureau of Agriculturally Important Insects (NBAII), Bengaluru. The highlights of the work done and the achievements made during 2016-17 are described below:

- 1269 mulberry germplasm accessions (270 exotic and 999 indigenous) were conserved in the *ex situ* field gene bank. Besides, two germplasm samples from Ziro Valley, Arunachal Pradesh and five from Alsigarh, Pai and Marli villages of Rajasthan were collected and planted in the nursery to raise saplings.
- 15 exotic and 7 indigenous mulberry accessions were collected from KSSRDI, Thalaghattapura, Bengaluru and added to the mulberry field gene bank enriching the total mulberry accessions to 1291.
- 22 new set of mulberry accessions from the

field gene bank were characterized for morphological, reproductive and anatomical characters and evaluated for growth, yield, bio-chemical parameters and natural incidence of pests and diseases. The data was updated in MGIS database.

- Based on morphological, anatomical, growth, yield, bio-chemical and propagation parameters, 18 exotic accessions were identified for crop improvement in temperate regions. Another 31 accessions were identified suitable for crop improvement in tropical regions.
- A total of 348 mulberry accessions were supplied to 7 institutes/organizations in 11 spells for research purpose.
- 55 mulberry accessions were evaluated for leaf quality and physiological efficiency at elevated levels of temperature (45°C) and CO_2 (500 ppm).
- Sprouting behaviour after winter indicated suitability of 18 exotic mulberry accessions for crop improvement in North-eastern region.
- One survey and exploration trip to Ziro Valley in Arunachal Pradesh was conducted and cocoons of wild mulberry silkworm *Bombyx huttoni* were collected.
- Three mutant silkworm breeds (TMS-4, TMS-13 and TMS-18) were collected from CSR&TI, Mysuru and after quarantine rearings and ensuring disease freeness, they were inducted into to the gene bank taking the total germplasm accessions to 473, which includes 81 multivoltine, 369 bivoltine and 23 mutants.
- BMI-0082 was identified as the best multivoltine accession for 8 traits and BMI-074, BNI-08I, BMI-080 and BMI-078 for seven traits.
- 78 silkworm accessions were supplied to 7 institutions in 15 spells for projects, PG experiments and breeding works.
- Two evaluation rearings of hybrids of all the 81 multivoltine accessions were conducted (in Rainy and Winter seasons) and their performance was recorded for rearing, post-cocoon traits and updated in SGIS database. Dfls of the 81 hybrids were released for taking up summer crop (third crop) and based on performance of the accessions during all three crops, superior accessions will be short listed for further evaluation at the collaborating institutes.
- Rearing of 20 short listed bivoltine exotic accessions pooled from all three batches was conducted, hybrid combinations were prepared with CSR2 as the male component for oval breeds, CSR 4 as the male component for dumbbell breeds and eggs have been preserved for supply to the collaborative institutes for further trials as per their rearing schedule.
- Under standardization of protocols for cryopreservation of tasar silkworm, *Antheraea mylitta* semen and its artificial insemination, a 10^{-1} dilution of sperms in Insect Ringer solution was found optimum for processing semen and Trypsin at a concentration of 2 to 3µg/ml was optimum for activation of spermatozoa which are crucial for standardization of artificial insemination protocols.

Seribiotech Research Laboratory, Kodathi, Bengaluru (Karnataka)

Seribiotech Research Laboratory, Kodathi, Bengaluru is involved in modern bio-technological research on silkworms and their host plants. During 2016-17, SBRL worked in the areas of silkworm improvement and pathogen detection by development of transgenic silkworm, marker assisted breeding and other bio-technological tools. The highlights of work done and the findings are as follows:

- Six combinations of transgenic CSR4 and CSR27 lines were developed by crossing with transgenic Nistari and backcrossing with the respective CSR parents. Presently, the transgenic CSR lines are at BC4F18 generation, which showed upto 56% survival after NPV infection and attained yield characters on par with pure race level.
- In order to use silk in bio-medical application, genes of Fibroin, Cecropin B and fibroin-cecropin fusion were cloned into the yeast Pichia pastoris for expression. The proteins produced were purified for further assessment in animal model.
- Vitellogenin Receptor (VgR) gene was validated as a functional marker for fecundity in silkworms.
- Seven functional gene markers including fibroin light and heavy chain, P25 and serine-glycine metabolism were found associated with silk fiber filament traits after screening of nine multivoltine races of *B. mori,* which will be used for improving filament characters of multivoltine races.
- Full-length genome of the highly pathogenic virus, BmDNV or BmDV2 is completely sequenced. Phylogenetic and sequence analysis have revealed a close homology of the Indian isolate of BmDV-2 with the Japanese isolate of BmDV-2. In order to check the viral resistance pattern, 20 bivoltine and 18 multivoltine parental silkworm races were screened for the nsd-2 gene. The nsd-2 gene was found to be present in the silkworm races APS-5, APS-HTP5 and BBE198. The viral sequence and distribution of nsd-2 gene for resistance will be used for developing DV 2 resistance breeds.
- Microsporidian infection of silkworm was found delaying Toll pathway activation in early infection and suppressed melanization in the later stage to provide favourable conditions for multiplication of *N. bombycis*.
- It is found that microsporidian infection enhances expression of melanization genes like prophenol oxidase (PPO1), PPO2 and Prophenol Oxidase Activating Enzyme (PPAE) in the early days of infection whereas, it inactivates melanization process in later days of infection to suppress the immune activity of *B. mori* for successful multiplication of the microsporidian spores. This information is useful for developing diagnostic tools for *Nosema bombycis* infection in silkworm.
- For the first time, cytotoxicity induced by the uzi fly in *B. mori* showed signs of cytotoxicity as well as activation of detoxification genes. Pro and anti-oxidation mechanisms in hemocytes unambiguously showed that the host immune system is suppressed by inducing toxicity in hemocytes by *E. bombycis* larva.
- Increased level of H_2O_2, degranulation, lipid peroxidation and membrane porosity revealed that the toxicity is caused by increase in Reactive Oxygen Species (ROS) elicited by *E. bombycis* invasion.

Silkworm Seed Technology Laboratory, Kodathi, Bengaluru (Karnataka)

Silkworm Seed Technology Laboratory is working towards development of various technologies for seed sector and disseminating the technologies at users' level, besides, generating the required trained manpower. The important achievements are detailed below:

- Long term silkworm seed preservation technology was developed for four multi-voltine races of eastern India *viz.,* Chalsa, Balapur, Debra and M12W for 30, 35 and 40 days respectively, under double step pre-

servation method. The field trails recorded 38-40 kg average cocoon yield with 92-96% pupation.

- Long term preservation technology was developed for Pure Mysuru for 40 days under double step method and field trials indicated an average cocoon yield of 44 kg with 90% pupation.
- Studies on application of host plant volatiles during oviposition in the silkworm double hybrid FC1 x FC2 indicated an improvement of 4.2 to 12% egg recovery over the control. Promising volatiles will be shortlisted and further tested for confirmation.
- A total of 1801 samples from 1165 lots were tested in the seed areas of Karnataka, Andhra Pradesh and Tamil Nadu involving Karnataka State Sericulture Research and Development Institute, Thalaghattapura, CSR&TI, Mysuru and Andhra Pradesh State Sericulture Research and Development Institute, Hindupur to record the disease incidence and create awareness among the farmers and field functionaries.
- The samples of egg shells, larvae and moths received from Basic Seed Farms and Silkworm Seed Production Centres of National Silkworm Seed Organization, bivoltine clusters and Registered Seed Producers were tested and the test results were provided to the concerned.
- Quarantine testing was conducted for 21,200 dfls from M/s. VSSPC and NSSO, Bengaluru and certified for export to the USA and Nepal.
- Under transfer of technology, 5 programmes were conducted on mother moth testing, disease management and disinfection, mulberry garden maintenance for seed crop rearing, seed production technology and quality silkworm seed cocoon generation covering 124 beneficiaries.

Central Tasar Research and Training Institute, Ranchi (Jharkhand)

The Central Tasar Research & Training Institute, Ranchi is engaged in generating useful technologies through R&D and their effective transfer to the field with an ultimate aim to improve the socio-economic status of the stakeholders associated with tasar culture. It provides support to all (tropical and temperate) tasar growing states through its extension network of eight Regional Tasar Research Stations, 13 Research Extension Centres and three P4 Silkworm Breeding Stations. The achievements of the institute and its nested units during 2016-17 are as detailed below:

Host Plant Improvement, Production and Protection

- Packages for cultivation of *Lagerstroemia speciosa* and silkworm rearing on this host plant are developed and being field-tested.
- Work is carried out for development of superior hybrids of Terminalia plant and 62 F1 hybrids are isolated which were being maintained for further evaluation.
- A package developed for moisture conservation and nutrient enrichment of soil in *Terminalia* plantation has increased the leaf yield up to 49.51%.

Silkworm Improvement, Production and Protection

- Multi-location field trial for high fecundity line, CTR-14 was conducted at five locations and recorded 20-22% gain over control in respect of productive traits.
- Two promising lines DTS and DT-12 were selected and 38,250 seed cocoons of these lines are under preservation at P-4 TBS, Katghora.

- Thermo-tolerant Daba bivoltine eco-race was isolated and generated F1 generation from thermo-tolerant line.
- Transact line survey conducted to study the population density of Raily eco-race during different seasons in different study sites indicated frequency distribution of silkworms in per m^2 of food plants as 25.2 to 40.7 during 1^{st} crop and 24.0 to 31.0 in 2^{nd} crop.
- Sericin has been separated from silk fiber waste for its isolation and characterization for commercial utilization. The availability of sericin in different fibre waste is about 1.8-2.5%.
- A field trial of semi-synthetic diet was conducted and chawki rearing on semi-synthetic diet was found better than outdoor rearing. The average cocoon yield/dfl was 82.97 in semi-synthetic diet as compared to 61.42 cocoons/dfl in outdoor rearing.
- Protocol for semen collection and cryo-preservation of tasar silkworm, *A. mylitta* semen was standardized.
- For easy detection of *Nosema mylittensis,* seven chemicals were tested and Sarcosyl was found effective as compared to prevailing technology of use of K_2CO_3 and KOH.
- For utilization of secondary metabolites from soil and phylloplane microflora for the control of AmCPV, the bacteria isolated from leaf of *Terminalia tomentosa* coded as TT4 and from leaf of *Terminalia arjuna* coded as TA4 have shown inhibition against other disease causing bacteria.
- Collection and identification of the chemical volatiles from *T. arjuna* and *T. tomentosa* plants with larvae feeding on them was carried out for management of yellow fly, *Xanthopimpla* predator in tasar cultivation.
- Under eco-race conservation and popularisation programme, 1,868 dfls of eco-race Bhandara and 3,950 dfls of eco-race Sarihan were produced and distributed to the farmers. 22,063 seed cocoons of eco-race Bhandara, 3,950 dfls of eco-race Sarihan and 2,900 seed cocoons of eco-race Sukinda are under preservation at RTRSs, Bhandara, Dumka, Baripada and Warangal, respectively.
- Oak tasar units produced 63,153 dfls during the year.
- Oak tasar silkworm germplasm of *A. proylei, A. pernyi, A. frithii* and 14 different breeds are maintained at Regional Tasar Research Station, Imphal (Manipur).

Central Muga & Eri Research and Training Institute, Lahdoigarh, Jorhat (Assam)

The Central Muga & Eri Research and Training Institute, Lahdoigarh, Jorhat along with its network of nested research stations and units *viz*., RMRS, Boko; RERS, Shadnagar; RERS, Mendipathar and RECs located at Lakhimpur, Coochbehar, Tura, Diphu, Kokrajhar and Fatehpur provides R&D support in muga and eri sectors for the development of the industry. The highlights of R&D work carried out during the year are as follows:

Host Plant Improvement, Production and Protection

- *Ailanthus grandis* (Borpat) with a leaf yield potential of 32 MT/ha/yr, was recommended as a primary host plant for the eri silkworm.
- 41433 saplings of the high yielding Som morphotypes S3 and S6 were multiplied at RMRS, Boko and supplied to the farmers.
- Antagonistic efficacies of rhizo-bacteria isolates against *Alternaria ricini* were tested and isolates LRP-4 and HF-3 showed the maximum inhibition of the pathogen.

- To assess the soil fertility status, 604 soil samples were collected from different districts covering all the states of North-East and analysed for pH, EC, Organic carbon, N, P, K, S, B, Fe, Mn, Zn and Cu. Based on the results, Soil Health Cards were issued with suitable recommendations.

Silkworm Improvement, Production and Protection

- Two new eri silkworm hybrids *viz.,* YZ x YS and GBS x GBZ were developed and tested for grainage parameters.
- Five bacterial pathogens *viz*., *Lysinibacillus shaericus*, *Serrtia marcescens, Enterococcus casseliflavus, L. fusiformis* and *Pseudomonas aeruginosa* infecting muga silkworm were characterized and studied.
- Anti-fungal peptides from the haemolymph of fungal challenged muga silkworm have been isolated and characterized.
- A new chemical disinfectant for controlling bacterial flacherie disease in muga silkworm has been developed.
- Forecasting and forewarning system for pests and diseases of muga host plants and silkworm have been developed.

Central Silk Technological Research Institute (CSTRI), Bengaluru (Karnataka)

CSTRI is the only research institute in the country dedicated to the research & developmental activities related to silk technology. CSTRI has its main institute at Bengaluru and 23 sub units *viz.,* one Regional Silk Technological Research Station, one Zonal Office, four Silk Testing and Conditioning Houses, nine Demonstration-cum-Technical Service Centres, two Textile Testing Laboratory / Demonstration-cum-Technical Service Centres, one Silk Testing and Conditioning House / Textile Testing Laboratory, one Silk Testing and Conditioning House / Demonstration-cum-Technical Service Centre, two Cocoon Testing Centres and two Raw Silk Testing Centres located in important silk clusters across the country. The sub-units serve as conduits for transfer of technology. Some of the important contributions made by the Institute and its sub units during 2016-17 are as follows:

Research

- Technology for eri cocoon degumming using HTHP extraction (degumming of silk) of sericin from silk yarn in the hank form was developed. Sericin was recovered from the degumming liquor by low temperature evaporation, spray drying and freeze-drying.
- Mulberry silk sericin was characterized for its moisture content, ash content, protein content, molecular weight, heavy metal content, etc. and cosmetic products with sericin as ingredient were produced. This will help the silk processing sector in value addition (by-product utilization) and to address the pollution issues.
- Pre-steaming technique was standardized for improving the winding performance of raw silk skeins, thereby enhancing the quality, productivity and economics.
- Hot air drying technologies were developed for tasar cocoons using conveyor hot air drier.
- Cooking technology for wet reeling of raily tasar cocoons was developed. Reeling performance of the improved cooking technology was found to be significantly better than conventional cooking method. Further, reeling parameters of raily tasar cocoons for both dry and wet reeling were optimized to consume raily cocoons for reeling, instead of spinning which is a common practice.

- A bio-finish has been developed for tasar fabrics to enhance the properties of fabrics in terms of aesthetic and thermo-physiological comfort, significantly.
- Technologies for optimization of stifling process and storage conditions of muga cocoons were developed.
- Eri silk based non-woven fabrics as facial masks for cosmetic applications were developed.
- Sericin based recipe for application on eri silk non-woven fabric for facemask application was developed.
- Carpet samples using three different hand knot structures were prepared and suitability of each structure for particular application was recommended after comparison.
- Machine for eri cocoon opening-cum-lap forming was designed to improve the productivity and quality of eri spun yarn.
- Single jersey, rib and interlock varieties of silk knitted fabrics were produced using international grade Indian raw silk from automatic reeling units. Backward and forward linkages for silk knits manufacturing were arranged.
- Easy-care finish was developed for wash and wear applications for soft silk.
- The following improved machineries were developed / modified:

  1. Finetuned Buniyaad Reeling Machine to replace thigh reeling
  2. High Speed Parallel (30 x 8) Card Punching Machine
  3. Fine tuned High Speed Card Lacing Machine
  4. CSTRI Eco Eri degumming Machine

Patents

Obtained

- Automatic tasar cocoon separating machine (Not holding)

Submitted

- Wet reeling machine for Tasar Sector
- Two bobbin weft winding machine with pirn winding
- Improved less friction Jacquard box for silk handloom

Products developed

- Nine silk carpet samples of different knot structures (Persian, Tibetan and Turkish)
- Sericin based soap
- Sericin based moisturizer
- Eri wool winter wear
- Eri wool stoles

Testing

A total of 1,07,265 lots of cocoons, raw silk, water, dyes, fabrics, etc., were tested for physical, chemical and eco-parameters by the main institute and sub-units during the period.

Implementation of post-cocoon technology components under Central Sector Scheme

During the period, 12 automatic reeling machines, three automatic dupion reeling machines, 43 multiend reeling machines, 24 cottage basin reeling machines, 738 vanya reeling and spinning machines, 12 hot air dryers, 128 CATD, 579 loom upgradation through pneumatic lifting / jacquards / pirn winding, 10 tub dyeing, six arm dyeing units, two fabric processing and four effluent treatment plants were established in the field covered under the Central Sector Scheme "Integrated Scheme for Development of Silk Industry".

COLLABORATION WITH INTERNATIONAL ORGANIZATIONS

1. **Japan:** An MoU of collaboration between CSB and the Institute of Agro-biological

Sciences, National Agriculture and Food Research Organization (NAFRO) to promote co-operation in the field of silkworm and silk industries was signed. A joint project towards rolling out the elements of collaboration elaborated in the MoU is in the final stages of preparation.

2. **China:** An MoU between CSB and Department of Agriculture, Guangxi Provincial Govern-ment, Guangxi, China for collaboration in silk sector is under execution. This would be followed by taking up a joint collaborative project benefiting both the countries.

3. **Bulgaria:** Under the collaborative research project with Sericulture and Agriculture Experiment Station, Bulgaria for a period of 5 years from 2016, mulberry and silkworm genetic materials were procured, which are undergoing trials at CSR&TI, Mysuru. The project aims to develop high yielding mulberry varieties and silkworm breeds suitable to both the countries.

4. **Australia:** CSTRI, Bengaluru took up the following three collaborative research projects with Deakin University, Australia:

- Development of sericin based nano-finish for textiles materials,
- Studies on photo degradation of silk fabrics and
- Studies on electro spun silk fibroin nano-composite fibres for biomaterial applications.

5. **African-Asian Rural Development Organization (AARDO), New Delhi:** CSB extended local support for organizing an international workshop on "Potential of Sericulture and Silk Industry for Employment and Income Generation in AARDO Member Countries" during 11-16 April, 2016 at Mysuru. Twelve countries from Asia and Africa participated in the workshop which came out with major recommendations for the development of sericulture and silk industry in African and Asian regions.

6. **SAARC Agriculture Centre (SAC), Dhaka:** In line with the agreement among the SAARC member countries, a joint collaborative project on sericulture sector comprising Bangladesh, Nepal and India is currently under preparation. As part of this, International Sericultural Commission has undertaken an evaluation study in Bangladesh. Evaluation study in India would be undertaken very shortly.

CAPACITY BUILDING AND TRAINING

During 2016-17, CSB, covering all the nine R&D institutions and three seed organizations spread across the country, continued to train and build capacities of industry stakeholders as well as in-house officers/officials and state government extension agents. The Capacity Building and Training division coordinated all such efforts of Skill Seeding and Skill Development by CSB covering all activities on silk value chain pertaining to all the four silk sub-sectors *viz.,* mulberry, tasar, eri and muga. A total of 16,690 farmers, seed producers, reelers, other industry stakeholders, students, extension agents, trainers, R&D and technical personnel were covered. The institute-wise and programme-wise coverage details are in Table 3.1 and 3.2

Table 3.1: Institution-wise break-up of number of persons trained during 2016-17

Sl. No.	Sector / Institute	Number
A	**R & D Sector**	
	CSR&TI, Mysuru	2811
	CSR&TI, Berhampore	1836
	CSR&TI, Pampore	1716
	CTR&TI, Ranchi	966
	CSR&TI, Lahdoigarh	3403
	CSTRI, Bengaluru	1225
	Sub-total (A)	**11957**
B	**Seed Sector**	
	NSSO, Bengaluru	1295
	BTSSO, Bilaspur	1906
	SSTL, Kodathi	264
	MSSO & ESSO	462
	Sub-total (B)	**3927**
C	**CBT Division, Bengaluru**	**806**
	Grand Total (A+B+C)	**16,690**

Institute-wise Highlights

CSR&TI, Mysuru

- Total persons trained - 2811 farmers and industry stakeholders
- 199 beneficiaries (farmers, entrepreneurs and officials) were trained under need-based programmes including intensive bivoltine technology, chawki rearing, bio-control agent production, Integrated Pest & Disease Management.
- 57 personnel were trained under intensive bivoltine training programme for 45 days including eleven newly recruited CSB Scientist-Bs and Field Assistants.
- Three DoS officials were trained in silkworm race maintenance programme for 45 days.
- Two volunteers from Japan Overseas Co-operation (JOCV) were trained in sericulture activities for 30 days.

Table 3.2 : Category-wise break-up of number of persons trained during 2016-17

Sl.	Training Category	Number
A	Skill training and exposure visits for sericulture farmers	7064
B	Silk reelers, twisters, dyers, printers, weavers	1725
C	Private graineurs, ASRs, support staff and seed officials	3927
D	CSB scientists, other employees and State Govt. officials	917
E	Post Graduate Diploma in Sericulture	31
F	Other sponsored training programmes	3026
	Total	**16,690**

- 44 entrepreneurs were trained in CRC activities for three months as a part of Seed Act registration process.

CSR&TI, Berhampore

- Total persons trained – 1836 farmers and industry stakeholders.
- Established three Sericulture Resource Centres at Barbakpur (Nadia), Alinagar (Malda) and Bankipur (Murshidabad) and trained 609 farmers.
- A total of 24 students (2015-16 batch) completed and 13 new students (2016-17 batch) joined 15-month PGDS course affiliated to the University of Kalyani, Nadia (West Bengal) to generate a steady stream of professionally competent human resources.
- 264 farmers of West Bengal and Odisha were trained in different training programmes like Disease and Pest Management, chawki rearing, late age rearing etc.
- A total of 94 officials both from state and central governments related to sericulture

were trained in different specialized training activities under Technology Orientation Programme.

- A total of 1465 farmers from Bihar and Uttar Pradesh were trained on mulberry sericulture under need based training programme.
- A total of 107 farmers from NE states have visited the Institute under exposure visit on the mulberry sericulture practiced in and around West Bengal.

CSR&TI, Pampore

- Total persons trained – 1716 farmers and industry stakeholders.
- A total of 720 persons were imparted skill enhancement trainings on different aspects of sericulture under CBT.
- In order to popularize sericulture in the Kargil zone of Jammu & Kashmir, 20 women were given practical training on Intensive Bivoltine Sericulture at Poyen village of Kargil district during June-July 2016.
- 50 technical staff of CSB posted at different units of the Institute throughout northern India were covered under Refresher Training Programme during the year at the Institute and RSRSs.
- 130 skilled farm workers of this Institute and its sub-ordinate units were given Skill Enhancement Training.
- 12 administrative staff working at different delegated units of CSB in the northern India were imparted training for operation of newly introduced FAS/PRS package.
- 78 DOS sponsored officials were provided training on various aspects under capsule courses during the year.
- 13 scientists were deputed for skill enhancement and specialized trainings to different CSB and other institutions in addition to one administrative staff under capacity building programme.

CTR&TI, Ranchi

- Total persons trained – 966 farmers and industry stakeholders.
- 886 persons were provided training under different programmes (Structured course-18; Farmers Skill Training-595; Farmers Exposure visit-100; *Ad hoc* programmes-173).
- 1,53,205 farmers / stakeholders were trained for cashless transaction (UPI, BHIM, Paytm, etc.).
- Two Technology Orientation programmes on Central Sector Scheme and Faculty Development Programme for PGDS trainers were organized in CTR&TI, Ranchi under which 31 persons were trained.

CMER&TI, Lahdoigarh

- Total persons trained – 3403 farmers and industry stakeholders.
- Organized Farmers Skill Training (CBT)-785; Exposure visit for technology awareness-60; Technology Orientation Programme -101; Sericulture Resource Centre (Farmers)-465; Farmers Skill Training-57; Farmers skilled training sponsored by DOS-UP-100; Farmers skilled training sponsored by DOS-Assam - 21; Farmers skilled training sponsored by DOS-Nagaland-14; Foundation training for CSB Young Scientists (MDP)-3.
- Four Sericulture Resource Centres were established during 2016-17 making it a total of eight SRCs (4 during 2015-16) in NE region. Total coverage through these SRCs during 2016-17 was 1277 farmers.

- One national level workshop-cum-training programme on "Sericulture and Seri-bio-technology" was organized at the institute during March 28-30, 2017, where 32 scientists/ scholars / students from different organizations participated.
- Under Institutional Biotech Hub Project, demonstration and awareness programmes were conducted where many students from nearby Schools and Colleges participated.
- Under Unified Payments Interface (UPI), 15,449 persons were sensitized.

CSTRI, Bengaluru

- Total persons trained – 1225 reelers, spinners, dyers, weavers and other industry stake-holders.
- Three scientists from CSTRI were deputed for two weeks' training (October 12-26, 2016) on processing technology to Zhejiang Science Tech. University, Zhejiang, China.
- A 'Centre of Excellence' for skill training in silk technologies was established under ISDS Project with the financial support from Ministry of Textiles, Govt. of India. The new building was inaugurated by Smt. Smriti Zubin Irani, Hon'ble Union Minister of Textiles on December 20, 2016.

NSSO, Bengaluru

- Total persons trained – 1295 seed cocoon producers, seed producers, DoS officials, players of Seed Act, Students etc.
- Two NSSO scientists were deputed for specialized training /exposure on "Shaping future of extension with new digital media" and three officials on "Public Procurement System".

BTSSO, Bilaspur

- Total persons trained – 1906 seed farmers, seed produces, farmers etc.
- 54,787 farmers were sensitized for cashless transaction (UPI) in Chhattisgarh.

MSSO & ESSO

- Total persons trained – 462 farmers, seed producers and other stakeholders.
- Training was imparted to 83 muga ASRs and 25 Private Graineurs against a target of 70 ASRs and 20 Private Graineurs, respectively. Besides, 198 muga RSPs were also trained under Seed Act.
- Training was imparted to 90 eri ASRs and 20 eri private graineurs on improved technologies for quality improvement. 46 eri RSPs were also trained under Seed Act.

SSTL, Kodathi

- Total persons trained – 264 stakeholders.
- Conducted 90 days training for Registered Seed Producers under the Seed Act.
- Conducted seed training for 50 farmers funded by DoS, Govt. of Karnataka.

CSB Secretariat

- Capacity Building and Training (CBT) Division conducted 14 training programmes covering 775 persons and 15 training deputations of CSB officers and officials to other agencies *viz.,* National Institute of Financial Management, MANAGE, Hyderabad, ISTM, New Delhi, UAS, Bengaluru, Parsam's Institute, Bengaluru, National Productivity Council etc., covering 31 persons.
- CSB organized two batches of Trainers' Orientation Programmes covering around 50 officers / officials for ISDP project imple-menting teams from Manipur state under NERTPS programme.
- As a special initiative for the first time this year,

two Faculty Development Programmes were organized for 50 CSB Scientists / PGDS faculties for updating their knowledge levels and session handling skills, one each at CTR&TI, Ranchi and CSR&TI, Berhampore during February 2017.

- During the year, a total of 2275 school and college students visited CSB complex at Bengaluru and were exposed to basics of sericulture and seri-technologies.

TRANSFER OF TECHNOLOGY

CSR&TI, Mysuru

- 1.5 lakh sericulturists were sensitized with new technologies through 2350 extension communication programmes on bivoltine rearing, mulberry and silkworm disease management and quality cocoon production.
- Four Sericulture Resource Centres (SRCs) were established (two each in Karnataka and Tamil Nadu) to promote bivoltine sericulture technology through awareness and demonstration programmes.
- Infrastructure assistance was provided to five CRCs to promote supply of bivoltine chawki silkworms to the farmers in South India.
- A manual containing guidelines for establishment of Seri-FPO (Sericulture Farmer's Producers Organization) in Karnataka was prepared in association with DoS.
- Weekly Seri-Agro-Met advisories on pest and disease management were issued for two districts each in Andhra Pradesh and Telangana.
- *Reshme Vaahini*, a 39-week sponsored programme on sericulture technologies was initiated through All India Radio.
- Technology Descriptor for Mulberry Sericulture in South India was published in regional languages for the benefit of sericulture farmers and officials.
- Seri-Lac-Agro system for income augmentation with sericulture farmers was successfully demonstrated by RSRS, Chamrajanagar.

CSR&TI, Berhampore

- 18 villages were identified and developed in eastern and North-eastern region of the country as seri model villages.
- Technology packages for rainfed and irrigated farming were disseminated among 1800 beneficiaries at their field level.
- By adopting Thiamethoxam (0.015%) for whitefly management in 150 farmers' field, the leaf loss was reduced by 8.1-13.8%.
- Yellow sticky traps for the management of major mulberry pests was adopted by 250 farmers and the crop loss was reduced by 6-10.6%.
- Application of soil test based Sulphur fertilizer in mulberry fields for productivity and quality improvement, covering 185 farmers observed a yield gain of 8.7-12.4%.
- For moisture retention, foliar application of 1% Potassium Chloride / *Jalsanjeevini* was taken up in mulberry field under rainfed condition by 100 farmers and observed a yield gain of 4.3-5.9%.
- A total of 3,015 farmers' database was created and 115 forewarning messages were sent in different languages *viz.,* Bengali, Hindi, Oriya, Nepali, Khasi in English script through m-kisan portal.
- In “Seri-5k” portal, 6,815 farmers' data were uploaded.
- Survey and surveillance of the pests of mulberry, forewarning as well as remedial measures are extended through m-kisan portal messages for the direct benefit of the sericulture stakeholders.

- Three documentary films of 15 minutes duration each were made on 'Kisan Nursery', 'Nari Shakti in Sericulture' and 'Bivoltine Sericulture'.
- 16 episodes of *Resham Katha* were broadcast through All India Radio and two FM stations for dissemination of information on modern technologies for the farmers.
- E-version of the brochures / pamphlets published in different vernaculars during the year were uploaded in the institute website www.csrtiber.res.in
- 16,375 stakeholders were sensitized through 273 extension communication programmes 51 awareness programme (3294 farmers), 31 audio-visual programme (1141 farmers), 44 exhibitions (3991 farmers), 39 field days (1753 farmers), 59 group discussions (1827 farmers), 37 technical demonstrations (1493 farmers) and 15 resham krishi melas / mini RKMs / workshops (2876 farmers). In addition, 35 farmers' training programmes (2279 farmers) and two trainers training programmes (15 farmers) were organized.

CSR&TI, Pampore

- A total of 13.5 lakh dfls were reared by 17,653 farmers under RECs / clusters across North-West India and produced 645.4 MT cocoons with an average yield of 47.7 kg/100 dfls.
- 10,000 dfls were reared by the farmers under IVLP, registering 15-20% increase in cocoon productivity with an average productivity of 42.79 kg/100 dfls in Kashmir Valley.
- Under the three Bivoltine clusters (Dachnipora, Lolab and Sonawari) in Kashmir covering 121 villages and 1,300 farmers, 1,31,700 dfls were reared by the farmers producing 60,609 kg of cocoons with an average productivity of 46.0 kg / 100 dfls.
- 32,535 stakeholders were sensitized with new technologies through 605 extension communication programmes *viz.,* group discussion, awareness programme, field days etc.
- 412 farmers were benefited in resham krishi mela organized by RSRS, Sahaspur at Kotabagh, Ramnagar (Uttarakhand).

CMER&TI, Lahdoigarh

- Large scale popularization of eri C2 breed was done among farmers through awareness programmes, trainings, demonstrations and group discussions.
- For In-situ conservation of muga silkworm in natural habitat, 200 muga dfls have been released to conservation site.
- Latest information on technologies in muga and eri culture was disseminated to 1.72 lakh farmers through SMS.
- Four seri model villages each in muga and eri were established with 100 beneficiaries in each village. Likewise, one seri model village was also set up in post-cocoon technology covering 62 beneficiaries. As a result, the average cocoon yield increased by 25.8% in seed crop and 27.5% in commercial crop over benchmark.
- 115 extension communication programmes were conducted *viz.,* krishi mela, technology awareness programmes, field days and group discussions for effective dissemination of technologies to the farmers and field functionaries.
- Under transfer of technology programme on integrated technology package of muga culture, 6,650 farmers were covered.
- Eight Sericulture Resource Centres were established to conduct training / demo sessions, regularly.

- A total of 18,834 beneficiaries were trained on different seri-technologies under different training programmes.
- Farmers skill training (CBT) -60 exposure visits by 101 persons, Technology orientation programme -101; Sericulture Resource Centre (Farmers)-465; Farmers skill training-57; Farmers skilled training sponsored by DOS, UP-100; Farmers skill training sponsored by DOS-Assam- 21; Farmers skill training sponsored by DOS, Nagaland-14; Foundation training for CSB Young Scientists (MDP)-3 and Unified Payments Interface-15449.

CTR&TI, Ranchi

- 9420 stakeholders participated under various motivation programmes.
- Multi location trial of CTR-14 conducted at 5 locations obtained encouraging result and showed 20-22% gain over control in respect of productive traits.
- Multi location trial of semi-synthetic diet conducted at 6 locations obtained very encouraging results.
- Integrated package of rearing with 4 low cost technologies continued to be popular among stakeholders.
- Eco-race conservation and popularization programme was undertaken with Bhandara, Sarihan, Sukinda and Andhra local at the respective regions.
- IVLP & CSB Cluster programmes were conducted successfully at RTRS, Baripada, Jagdalpur, Bhandara, Warangal, Bhimtal and Imphal and farmers harvested good crops.
- Under IVLP 1,24,480 dfls were prepared and a total of 27,21,564 cocoons harvested @ 40.8 cocoons / dfl through RTRS, Baripada.
- A total of 10,29,400 cocoons were harvested @ 51.5 cocoons / dfl through RTRS, Jagadalpur in Chhattisgarh under IVLP.

CSTRI, Bengaluru

- 107 extension communication programmes *viz.,* group discussions, awareness programmes, stakeholder melas, technology upgradation programmes were conducted covering 3,375 stakeholders of the silk industry.
- 302 technology demonstrations were conducted on various technologies developed by the institute.
- 413 field programmes were conducted on various post-cocoon activities.
- About 1,576 field visits were made for solving / guiding various field problems / issues.

SSTL, Kodathi, Bengaluru

- 2600 persons were sensitized under technology awareness programme.
- Two technology orientation programmes were organized and 31 personnel were trained.
- 9,420 stakeholders were sensitized under various motivation programmes.

IT INITIATIVES

Some of the significant IT initiatives by CSB during 2016-17 are given below:

- mKisan: CSB has widened the outreach of scientists and experts to disseminate information and give scientific advisories to farmers through their mobile telephones using mKisan Web Portal; till date, 22 lakh messages have been sent.
- **SMS service**: It is provided through mobile phone on day-to-day rates of silk and cocoons in all prominent markets for the use by the farmers and other stakeholders of the industry. Both push and pull SMS services are in

operation. All the registered 4100 farmers are receiving SMS on daily basis.

- **SILKS Portal:** Sericulture Information Linkages and Knowledge System (SILKS) portal has been developed in association with North Eastern Space Application Centre, Dept. of Space, Govt. of India by capturing geographical images through satellite and used for analysis and selection of potential areas for promoting sericulture activities in those areas. Multi-lingual, multi-district data is being updated regularly.
- **SERI-5K database**: It has been designed and developed to maintain and manage Bivoltine cluster farmers throughout the country.
- **Video Conference:** CSB has full-fledged video conference facility at CSB Complex, Bengaluru, CSR&TI, Mysuru, Berhampore and Pampore, CTR&TI, Ranchi, CMER&TI, Lahdoigarh and Regional Office, New Delhi. A total of 45 video conference sessions were successfully conducted during the year.
- **CSB website:** CSB has a website "csb.gov.in" in bi-lingual-English and Hindi. Maximum information is disseminated through this portal for the benefit of common citizen, who may need to know about the organization as well as schemes and other details about the silk industry. Publicity of sericulture plan programmes, achievements and sharing of success stories are featured in the website. Initiated the process to make CSB website on par with Guidelines for Indian Government Websites (GIGW) compliant with security audit.
- **On-line applications:** CSB is accepting online applications for various posts, making it easy and effective for job aspirants to submit their applications. This also leads to an efficient processing of applications on various parameters and also to complete the screening / selection process in time.
- **AEBAS:** Aadhaar enabled bio-metric attendance system is successfully under implementation at CSB, Bengaluru and 133 nested offices.
- **Farmers and Reelers Database:** CSB has been creating and managing the Farmers and Reelers database and over 1,50,000 farmers and reelers data have been captured till March 2017 from all over the country.
- **MIS on "Intensive Bivoltine Sericulture Development Project in North-eastern states:** MIS was hosted on the virtual servers at the Computer Section, CSB.
- **Grievances and VIP references:** Designed and developed programme database for management of grievance petitions and VIP references.
- **Digitization of Pension Records:** A software has been designed / developed for digitization of pension papers. All the pension records were digitized for security, safety and ease of management.
- **Digitization of Land records:** CSB has uploaded details of 164 stations / units of CSB land records on www.ncog.gov.in as mandated by Govt. of India.

Applications of Remote Sensing (RS) and Geographical Information System (GIS) in Sericulture Development

CSB in collaboration with North Eastern Space Applications Centre (NESAC), Umiam, Shillong (Meghalaya) is implementing the project *viz.*, "Applications of Remote Sensing (RS) and Geographical Information System (GIS) in Sericulture Development" with twin objectives *i.e.,* (i) to map and identify potential areas for

rearing mulberry and non-mulberry food plants in selected districts, and (ii) to integrate all spatial and non-spatial information pertaining to seri-development in SILKS portal. As a part of this project, the team has developed a Sericulture Information Linkages and Knowledge System (SILKS) web portal and put in the public domain under the web id http://silks.csb.gov.in, which covered 108 select districts in 24 states.

Outcome of the first phase

- Survey and mapping of potential areas for seri-plantation in 108 districts (24 states).
- Launch of a web-portal SILKS in public domain in 12 languages.
- SILKS portal provides various information like areas suitable for sericulture, disease and pest forewarning and management, weather advisory, schemes/programmes implemented, etc.
- The project won 'National e-Governance Award 2014-15', in the category of Innovative use of GIS technology for e-Governance.

Second phase

As a part of the extension of the project, CSB has approved the 2nd phase in collaboration with NESAC covering 70 additional districts from the 25 states, out of which 20 districts are from North-eastern region. Highlights of 2nd phase project are:

- NESAC, Umiam, Meghalaya has conducted four interaction meets in different zones for finalizing target distribution in consultation with state representatives collecting feedback of the phase-I findings.
- Satellite data have been procured covering all the selected 20 districts of NE for mapping of potential areas and analysis of data is in progress.
- Coordinated with State Remote Sensing Application Centres and DoS for finalization of the 50 districts to be covered (other than NE region).
- Completed mapping of potential areas for mulberry and non-mulberry silkworm food plants in Jaintia Hills district of Meghalaya.
- Generation of spatial layer for socio-economic data has been initiated in the project areas.

B. SEED ORGANIZATION

The seed organization in CSB consists of National Silkworm Seed Organization (NSSO), Bengaluru; Basic Tasar Silkworm Seed Organization (BTSSO), Bilaspur; Muga Silkworm Seed Organization (MSSO) and Eri Silkworm Seed Organization (ESSO), Guwahati, which are responsible for production and supply of basic as well as commercial seed. These organizations have set in the standard for seed cocoon production of quality dfl in mulberry and vanya sectors.

National Silkworm Seed Organization

National Silkworm Seed Organization (NSSO) is a premier mulberry silkworm seed producer in the country where quality basic silkworm seed and also production and supply of quality commercial bivoltine and cross breed silkworm hybrids is effected through its Basic Seed Farms (BSFs) and ISO certified Silkworm Seed Production Centres (SSPCs). NSSO with all its seed production centres, ISO 9001:2008 certified, ensures production of seed of the highest quality.

Seed Cocoon Generation and Basic Silkworm Seed Production

The Basic Seed Farms (BSFs) generate quality seed cocoons and produce basic seed. During the year, all the 19 BSFs and one Centre for Sericulture Development produced 70.25 lakh bivoltine and 33.27 lakh multivoltine seed cocoons against a target of 78.35 and 47.94 lakh, respectively.

Table 3.3: Basic seed production and supply

Breed		P3	P2	P1	Total
Production	Bivoltine	3613	35103	847032	885748
	Multivoltine	1625	9187	255480	266292
	Total	**5238**	**44290**	**1102512**	**1152040**
Supply	Bivoltine	8903	21508	586937	617348
	Multivoltine	1625	9147	265430	276202
	Total	**10528**	**30655**	**852367**	**893550**

A total of 11.52 lakh basic seed (8.86 lakh bivoltine and 2.66 lakh multivoltine) was produced. The comparative bivoltine and multivoltine basic seed production at BSFs is presented in Table 3.3. A quantity of 6.17 lakh bivoltine and 2.76 lakh (including the balance of previous year) multivoltine basic seed were distributed.

Generation of quality seed cocoons: Aided with highly successful 'Adopted Seed Rearer' (ASR) system involving technically sound and competent seed rearers adopted by different SSPCs, 1074.34 lakh bivoltine seed cocoons were generated during the year for the production of bivoltine hybrid and cross breed dfls. NSSO has also supported the DOS and Registered Seed Producers (RSPs) of West Bengal, DOS, Uttar Pradesh and North-eastern states by generating 53.30 lakh (40.14 lakh for West Bengal; 13.16 lakh for Uttar Pradesh) bivoltine seed cocoons in South India and supplying to them against an indent of 53.68 lakh seed cocoons (38.80 lakh for West Bengal; 14.88 lakh for Uttar Pradesh).

The Seed Cocoon Procurement Centre (SCPC) at Kunigal supported the SSPCs by procuring 33.78 lakh multivoltine seed cocoons for preparation of cross breed layings. SCPCs at Denkanikottai, Kunigal and Punganur had generated 37.62 lakh, 15.09 lakh and 10.62 lakh multivoltine seed cocoons, respectively through ASRs of their respective areas for crossbreed dfl production at SSPCs.

Commercial Seed Production in Silkworm Seed Production Centres:

The main task of NSSO is the production of quality commercial silkworm hybrid dfls (bivoltine x bivoltine and multivoltine x bivoltine) and its distribution among farmers. Accordingly, during 2016-17, a record quantum of 430.37 lakh dfls – the highest ever in the history of NSSO, were produced against the target of 450.00 lakh dfls achieving 95.64% through its 20 SSPCs. Out of the total production of 430.37 lakh dfls, 342.77 lakh dfls were bivoltine hybrids (79.65%) while the crossbreed layings were 87.60 lakh dfls (20.35%). 342.77 lakh bivoltine hybrids were produced against a target of 350.00 lakh (achievement of 97.93%). This includes 7.32 lakh CSR hybrids, 308.84 lakh double hybrids, 12.03 lakh traditional hybrids and 14.58 lakh new hybrids. N x Bi formed (45.02 lakh) the core production of multi x bi voltine hybrids, followed by Nistari x M12W (22.61 lakh). The bivoltine hybrid dfl production and distribution for the last year is indicated in Table 3.4.

Table 3.4: Combination-wise target and production of dfls (2016-17)

Combination		Target (lakh dfls)	Achievement (lakh dfls)	% Achievement
Bivoltine hybrid	CSR2 x CSR4	12.00	7.32	61.00
	FC1 x FC2	318.00	308.84	97.12
	SH6 x NB4D2	20.00	12.03	60.15
	Others		14.58	
Total		**350.00**	**342.77**	**97.93**
Multi x Bivoltine hybrid	PM x CSR2	22.00	8.15	37.05
	PM x FC2		9.08	
	N x Bi	44.00	45.02	102.32
	N x M12 (W)	34.00	22.61	66.50
	Others		2.74	
Total		**100.00**	**87.60**	**87.60**
Grand Total		**450.00**	**430.37**	**95.64**

NSSO supplied 271.85 lakh bivoltine and 76.45 lakh multi x bivoltine hybrid dfls to various state departments and CSB units during the year. The year-wise production and distribution details of basic and hybrid dfls for the past five years are presented at Figs.3.1 to 3.5.

Fig 3.1 : Year-wise Bivoltine Basic Seed Production in BSFs

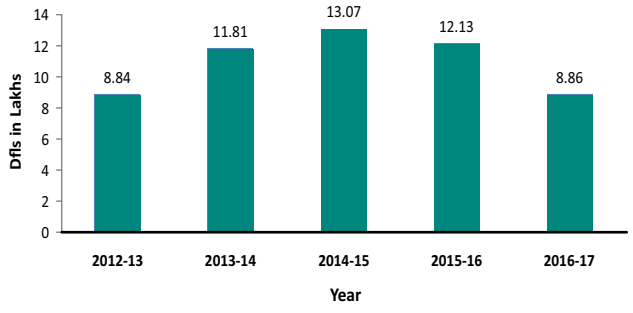


Fig 3.2 : Year-wise Multivoltine Basic Seed Production in BSFs

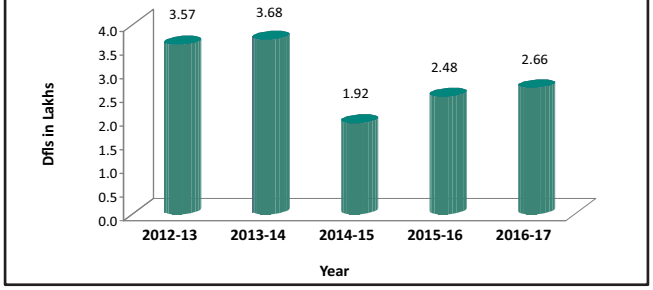


Fig 3.3 : Year-wise Commercial dfl Production by SSPCs of NSSO

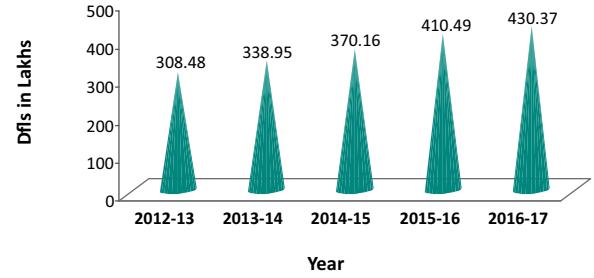


Fig 3.4 : Year-wise Bivoltine Hybrid dfl Production at SSPCs of NSSO

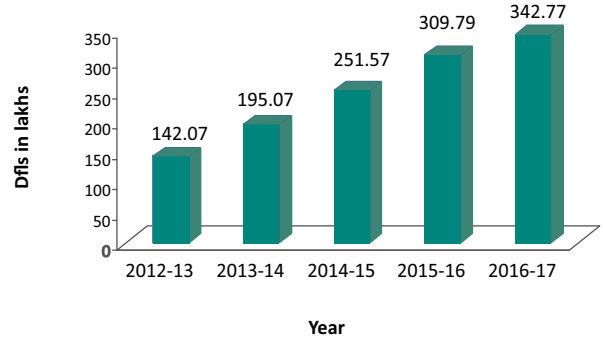
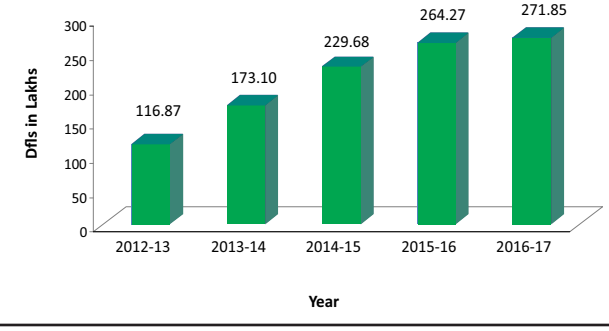


Fig 3.5 : Year-wise Bivoltine Hybrid dfl Distribution by SSPCs of NSSO



Extension Activities: The extension units including Sericulture Service Centres (SSCs) and Sericulture Service Units (SSUs) together with scientists of SSPCs and NSSO played a significant role in distribution of commercial seed produced at SSPCs and providing extension support through crop monitoring and transfer of proven technologies to the field. During the year, 19 SSCs

and 13 SSUs distributed 123.08 lakh dfls including 60.09 lakh bivoltine hybrid dfls.

- ***Cluster Promotion Programme:*** In 16 clusters of NSSO, 36.18 lakh dfls were distributed against a target of 34.18 lakh dfls, achieving 105.85% and the estimated raw silk produced was 347.43 MT.
- ***Institute Village Linkage Programme:*** 1.01 lakh bivoltine hybrid dfls were distributed in Andhra Pradesh and Tamil Nadu and the estimated raw silk generated was 10.11 MT.
- ***Chawki Rearing Centre (CRCs) discount scheme:*** Distribution of bivoltine hybrid dfls through the CRC discount scheme gained immense popularity. A quantum of 157.64 lakh dfls were distributed under the scheme.

Trials of New Silkworm Hybrids: 7.21 lakh dfls comprising 4.48 lakh bivoltine x bivoltine combinations and 2.73 lakh multi x bi combination dfls were produced and supplied for evaluation.

Seed Act Implementation: NSSO continued its efforts for implementation of the provisions of CSB (Amendment) Act, 2006. New applications received for registration during the year were scrutinized and processed. 989 multi-colour, bilingual (Hindi-English) Registration Certificates were prepared using a special software package developed for the purpose. Certificates in respect of 256 RSPs, 161 RCRs and 572 RSCPs were printed and dispatched under 45 days of clearance, on an average. All the Registered Seed Producers and Chawki Rearers across various states were linked to the concerned Seed Officers (SO) and Seed Analysts (SA) and the SAs and SOs were regularly notified with the additions. The data base of registered stakeholders were updated from time to time and sent to all the State Sericulture Departments and also uploaded to the CSB website.

On-site inspection of the premises of RSPs and RCRs by Seed Analysts and Seed Officers was carried out for the purpose of system and product certifications respectively. Seed Officers and Seed Analysts Meet was organized at Mysuru, Bilidevalaya, Madanapalle and Salem to take stock of the status of mandatory inspections. A one-day technical workshop was conducted for Registered Chawki Rearers at Bengaluru and Hindupur. Certificate training course of three months duration was organized in CSRTI, Mysuru for chawki rearing and in SSTL Kodathi for seed production. 63 persons completed training in three batches in Chawki rearing. Refresher training to 128 chawki rearers, 763 RSPs and training on quarantine procedures were provided to 26 scientists. Apart from this, 11 awareness programmes were also conducted.

Impact of NSSO on bivoltine raw silk production: NSSO leads the bivoltine raw silk production programme in the country by contributing nearly 60% of the country's bivoltine raw silk production through distribution of 271.85 lakh bivoltine hybrid dfls directly and another 40% indirectly through supply of bivotline basic seed to various state sericulture departments for utilizing the same for commercial bivoltine silkworm seed production.

Progress of Vanya Seed sector

Tropical Tasar: Basic Tasar Silkworm Seed Organization (BTSSO) is responsible for organizing the systematic seed production and supply of tropical tasar, functioning at Bilaspur, Chhattisgarh with its wings of 21 Basic Seed Multiplication and Training Centres for Tropical Tasar (BSM&TCs) operating in different states and a Central Tasar Silkworm Seed Station (CTSSS) at Kota, Chhattisgarh. CTSSS is responsible for production

and distribution of tasar nucleus seed to BSM&TCs for further multiplication, besides, maintaining germplasm of different silkworm races. CTSSS has produced and supplied 1.20 lakh tasar nucleus dfls during the year for replenishment of existing stock of BSM&TCs. There is a gradual improvement in performance of these 21 BSM&TCs located in nine states that produced 39.00 lakh dfls during 2016-17. Besides, BTSSO has also produced 7.77 lakh dfls by involving private graineurs.

Oak Tasar: The cumulative production by two RTRSs, one oak tasar grainage, three RECs and two REC-cum-BSM&TCs located in six states in oak tasar seed production during 2016-17 was 0.63 lakh dfls.

Muga seed: The Muga Silkworm Seed Organization comprised two P4 and five P3 Muga Seed Stations (Central Sector) and 10 P2 seed centres and six reeling units (state sector). The present reorganized MSSO with the units created under Central Sector has two P4 units, six P3 units for production of basic seed and one Muga SSPC for the production of commercial seed. Besides, under NERTPS, three muga P3 Basic Seed Stations and one SSPC have also been established. The cumulative performance of Muga Basic Seed Stations during the year 2016-17 was 4.64 lakh muga dfls and also one Muga SSPC located at Kaliabari (Boko) in Assam produced 2.23 lakh muga dfls.

Eri seed: The Eri Silkworm Seed Organization (ESSO) located at Guwahati, Assam performed well with its single Eri SSPC in NE region and four Eri SSPCs in non-traditional states producing 4.78 lakh eri dfls during 2016-17 for distribution to different state departments. Under NERTPS, one P2 Eri Basic Seed Farm has been established.

C. COORDINATION AND MARKET DEVELOPMENT

Co-ordination: Board's Secretariat

The CSB has been assigned the responsibility for the overall development of silk industry in the country, besides, advising Govt. of India in the matters related to the silk industry. Various developmental and interrelated supportive programmes, as well as R&D schemes are implemented by CSB.

The CSB with its secretariat located at Bengaluru monitors the activities of R&D organizations, frontline demonstrations, maintenance of four tier silkworm seed production network, leadership role in commercial silkworm seed production, standardizing and instilling quality parameters in various production processes and promotion of 'Indian Silk' as a brand in domestic and international markets. These activities are being carried out by the R&D institutes, seed organizations, regional offices and raw material banks located in different parts of the country.

Publicity and Media Programmes
CSB Secretariat

The Publicity Division of CSB Secretariat has carried out various publicity and media activities during the year on sericulture and silk industry, as detailed below:

I. Publications

a. Indian Silk: The CSB published Indian Silk - the bilingual industrial journal devoted to the sericulture and silk industry of India. Presently, the journal is in its 55th year of publication.

b. Annual Administrative Report 2015-16: This annual bilingual Report (Hindi and English) provides detailed information about the

activities of CSB and its nested units, research and development, project and schemes implemented by the CSB and DOSs in various states and the relative progress, achievements and accolades and industry statistics. The Report was published during October 2016 and placed before the Parliament.

c. Handbook of Sericulture Technology in Telugu language: The 4th edition of the Board's popular publication "Handbook of Sericulture Technology" was translated and printed in Telugu language and made available to the concerned state Directorates of Sericulture.

d. CSB Act and Rules: The updated version of the CSB Act (1948), (Amendment) Act 2006 (42 of 2006), CSB Rules 1955, (Amendment) Rules 2015, CSB General Provident Fund Rules 1996, as amended upto 24.10.2000 and CSB Silkworm Seed Regulations 2010, as amended upto 31.03.2015 was brought out in January, 2017.

e. Multicoloured Calendar-2017: The Publicity Section has printed in-house multicolour new year calendar - 2017 depicting pre and post-cocoon activities of sericulture and silk industry and distributed to all the units of CSB and organizations associated with the silk industry.

f. CSB's Vision Board: CSB's Vision Statement "Our Vision - To see India emerge as the Global Silk Leader" was designed/printed in bilingual (English and Hindi) and supplied to various units of CSB for display in prominent places.

II. Press and Media relations

CSB had released a number of press notes on various occasions and organized for media coverage of important events. The major ones are:

a. Sericulture Stakeholders Meet held in the CSB Complex, Bengaluru on August 20, 2016. Shri Anant Kumar, Union Minister of Chemicals and Fertilizers and Parliamentary Affairs inaugurated the meet. Shri K.M. Hanumantharayappa, Chairman, CSB and Shri T.V. Maruthi, Chairman, Indian Silk Export Promotion Council were present on the occasion.

b. Launch of Indigenous Automatic Silk Reeling Machine and Inauguration of Centre of Excellence for Training by Smt. Smriti Zubin Irani, Hon'ble Union Minister of Textiles on 20.12.2016 at CSB Secretariat, Bengaluru. Shri D.V. Sadananda Gowda, Union Minister of Statistics and Programme Implementation, Shri Ajay Tamta, Hon'ble Union Minister of State for Textiles, Members of Parliament and CSB Members, Secretary (Textiles) and Joint Secretary (Textiles) from Ministry of Textiles, Govt. of India graced the occasion. Doordarshan Kendra, Bengaluru telecast the live coverage of the event both at regional as well as national level. Other national and local English, Hindi and Kannada dailies also covered the event, apart from other local TV channels and All India Radio, Bengaluru.

In this connection, a curtain raiser Press Meet was held on 19.12.2016 at Press Club, Bengaluru and Shri K.M. Hanumantharayappa, Chairman, CSB addressed the media. The events were widely covered in the electronic as well as print media. Multicolour advertisements were released on the inaugural function of ARM and Centre for Excellence in few national and regional dailies in English, Hindi and Kannada languages.

III. Audio-visual publicity

a. In order to popularize sericulture as well as promote use of silk, CSB has produced radio and video spots of 20-second duration in English, Hindi and 13 vernacular languages.

CSB has released these spots in All India Radio and Doordarshan network, across the country for a month.

b. Besides, radio advertisements were released in the Prime Minister's programme 'Mann ki Baat' and 'Ek Nayi Subah' in AIR. CSB also released TV advertisement spots of 20 seconds duration during TV telecast programme on DD National Network on 'Badhte Kadam – Live Talkathon with Prime Minister of India' on May 28, 2016, highlighting two years of present government's achievement and in DD Kisan channel, agricultural programme in DDK, Guwahati and Programme Production Centre, North-East. CSB has also coordinated 14 episodes of live phone-in-programme in DDK, Guwahati and PPC, North-East involving CSB Scientists from North-East to address the local problems of the Sericulturists.

c. The Central Office of CSB has also produced a short video film of 3.45 minutes duration on "Empowerment of Tribal Women through Tasar Culture" in English and Hindi languages to commemorate the event of International Women's Day held on March 8, 2017 at Vigyan Bhavan, New Delhi inaugurated by Union Minister of Textiles, Govt., of India.

IV. Participation in exhibition/trade fairs

- CSB participatied in the 14th Folk Fair 2016 held at Puri, Odisha during June 4-8, 2016 in coordination with RO, Bhubaneswar and also in the 20th National Exhibition 2016 held at Kolkata during August 10-14, 2016,
- Publicity Section also coordinated with RO, Bhubaneswar for participation in the National Level Special Handloom Expo 2016 held at Bhubaneswar during September 26 to October 9, 2016.

CSB also participated in:

- Krishi Shilpa Banijya Mela held at Chandipur district, Purba Medinipur, West Bengal during December 2-6, 2016 in coordination with CSRTI, Berhampore.
- Sunderban Krishi Mela-O-Loko Sanskriti Utsav, held at Kultali, South 24 Parganas, West Bengal during December 20-29, 2016 and
- Vision Jammu & Kashmir held during February 23-25, 2017 at Jammu in co-ordination with RSRS, SCTH, Jammu and SMOI, Srinagar.
- Reshme Krishi Mela held at Doddaballpur, Karnataka on February 17, 2017, organized by CSR&TI, Mysuru.

V. Others

Publicity Section designed a customized memento for the retiring employees and smart identity card for the employees of CSB.

VI. Publications of research institutes

CSR&TI, Mysuru: Published 26 research papers in international and 10 in national journals, 52 Abstracts, 9 Books/book chapters, 11 technical reports and 15 technical bulletins and pamphlets.

CSR&TI, Berhampore

- Two issues of News and Views, a half-yearly R&D news bulletins were published.
- Four issues of Resham Krishi Barta, a quarterly sericulture bulletin in Bengali, were published.
- 19 international and national research papers, nine research articles, one book, 14 booklets, 68 extension literatures like technical bulletins/ compendium/ brochures/ pamphlets/ extension manuals/ leaflets in local language were published.

CSR&TI, Pampore: Published 12 research papers in international journals, 22 in national journals,

56 abstracts, three books/book chapters, five booklets, seven bulletins and two pamphlets.

CTR&TI, Ranchi: Published 22 research papers in international and six in national journals, four abstracts, seven popular articles, one book and two extension bulletins.

CMER&TI, Lahdoigarh: Published 7 research papers in journals and 13 research articles in the proceedings of various seminars / conferences / workshops, six books / manuals and 24 technology posters. Also published two issues of Sericulture Newsletter (Hindi) and (English).

SBRL, Kodathi: Published seven research papers in international, one abstract and one Book chapter.

CSGRC, Hosur: Published eight research papers in international and four in national journals, 15 abstracts, three Book chapters, one technical report and three manuals & pamphlets.

CSTRI, Bengaluru: Published 3 research papers in international and 5 in national journals, 20 abstracts and 2 pamphlets.

NSSO, Bengaluru: Five publications including research/popular articles and papers presented / accepted for scientific seminars / workshops.

Hindi publications

- CTRTI, Ranchi published "Tasar Samvad" Issue-7, Annual Technical Report 2014-15, Booklets / Pamphlets on operation of Motorized Reeling Machine, M.M. 5 "Tasar Khadya Paudhon ke liye dwitiya poshak tatvon ka mishran", Depuratex and Jeewan Sudha. Soil Health Card in bilingual.
- BTSSO, Bilaspur published "Niji Beejagaar ke sthapna hetu aavashyak aadharroop ghatak", "Tasar Reshamkeet beej phasal ke dauran visankraman evam swatchata and Reshamkeet beej utpadan mein istemal hone wale rasayanikon pe ghol benane kee vidhiyan" pamphlets in bilingual, Newsletter (Tasar Reshamkeet Beej magazine Vol. 2, issues 1 and 2, Feb, 2017)
- CSRTI, Mysuru published half-yearly Magazine "Resham Kiran" December, 2016, Vol. 5, Issue 1.
- CMERTI, Lahdoigarh published Hindi Newsletter July-December, 2016.
- CSGRC, Hosur published Newsletter Vol. 16, Issue 2, December, 2016 and Annual Report 2015-16 in bilingual.
- CSRTI, Pampore published Intensive Bivoltine Sericulture Technology Package for North-West India in Hindi.

OFFICIAL LANGUAGE POLICY

During the year, efforts continued for achieving the targets fixed by the Department of Official Language, Ministry of Home Affairs, Govt. of India, New Delhi for implementation of the Official Language Policy of the Union for the year, 2016-17. As a result of accelerating the progressive use of Hindi in official purposes, the following offices of CSB were awarded by different forums. The awards so received were:

- NSSO, Bengaluru received Third Prize from TOLIC, Bengaluru for the year 2015-16 on 22.07.2016.
- CTR&TI, Ranchi received Official Language Regional Third Prize and Certificate for the year 2015-16 on 12.11.2016 and also received prize for Excellent Presentation of Official Language activities from TOLIC, Ranchi on 28.10.2016.
- CSR&TI, Berhampore received Official Language Regional Second Prize for the year 2015-16 on 12.11.2016.

- MSSO, Guwahati received Official Language Regional Second Prize for the year 2015-16 on 12.11.2016 and also received TOLIC [Undertaking], Guwahati Refinery Citation for the year 2015-16 on 28.12.2016.
- RO, Guwahati received TOLIC (Under-taking), Guwahati Refinery Citation for the year 2015-16 on 28.12.2016.
- RO, Bhubaneswar received Official Language Regional first prize and Certificate for the year 2015-16 on 12.11.2016.
- DCTSC, Cuttack received Official Language Regional Second Prize and Certificate for the year 2015-16 on 12.11.2016.
- TTL, Varanasi received Official Language Regional Third Prize and Certificate for the year 2015-16 on 06.10.2016.
- Certification Centre, Varanasi received Official Language Regional First Prize and Certificate for the year 2015-16 on 06.10.2016.
- RO, Lucknow received Official Language Committee Sixth Prize and Citation for the year 2015-16 on 16.12.2016.
- MRMB, Shivsagar received Official Language Regional Third Prize for the year 2015-16 on 12.11.2016.

Compliance of official language Act, 1963 and Rules, 1976: Apart from ensuring 100% compliance of Section-3(3) of the Official Language Act, 1963, letters received in Hindi were replied to in Hindi and bilingual under Rule-5 of Official Language Rules, 1976. Targets fixed for original correspondence, fax, etc., in the Annual Programme 2016-17 were also achieved. 95 offices including the CSB Secretariat have so far been notified under Rule 10(4) of Official Language Rules, 1976 and Orders/Memoranda were issued for doing work in Hindi under Rule 8(4) of Official Language Rules, 1976.

Training: Hindi training was imparted in a phased manner in Board's Secretariat and its subordinate units. 21 officers and 60 staff were trained on computer for doing work in Hindi.

Meetings: Quarterly meetings of Official Language Implementation Committee, which monitors official language implementation programme in CSB Secretariat, research institutes and other main/sub-ordinate offices, were held on 22.06.2016, 28.09.2016, 22.12.2016 and 28.02.2017. Secretariat, Bengaluru organized meeting of Hindi Advisory Committee of MoT at Mussoorie, Uttarakhand on 29.06.2016 in co-ordination with RSRS, CSB, Sahaspur, Dehradun and other CSB offices situated at Dehradun, Uttarakhand and also attended to the meeting of the same Committee in Kolkata held on 27.12.2016. In most of the attached/sub-ordinate offices also, the meetings of Official Language Implementation Committee were held as planned.

Hindi week/Fortnight: Hindi Fortnight was observed jointly by Central Office, National Silkworm Seed Organization and Central Silk Technological Research Institute, Bengaluru from 1-14, September, 2016 in CSB premises in Bengaluru and competitions such as handwriting, extempore speech, noting-drafting, dictation, Hindi reading, written quiz, cross word and glossary competitions were organized. Hindi day was celebrated on 14.09.2016. Hindi Fortnight valedictory-cum-prize distribution function was organized on 23.09.2016. Smt. Meena S. Kamath, Senior Translator (Hindi), CSB Secretariat, Bengaluru, Smt. C.P. Jayashree, Assistant Director (OL), Smt. Sampath Kumari, Stenographer (Hindi), NSSO, CSB, Bengaluru and Smt. Asha Rao, Senior Translator (Hindi), CSTRI, Bengaluru received consolation prizes in ''Vividha'' Competition conducted by TOLIC, Bengaluru on 26.12.2016. Shri O.P.N. Singh, Asst. Librarian & Information

Officer, CSTRI, CSB, Bengaluru received consolation prize in "What is the Right Term?" organized on the occasion of Hindi Day 2016 by TOLIC, Bengaluru on 26.12.2016. Hindi Day/ Week/Fortnight was also organized in most of the attached/sub-ordinate units of CSB.

Workshop/Seminar: CSB Secretariat organized five one-day full-time Hindi workshops for the employees, one in each quarter. CSR&TI, Berhampore organized a Rajbhasha Technical Seminar on 20.01.2017 in which officers and staff from different R&D institutes and field units participated. Hindi workshops were also organized in attached and sub-ordinate offices of the Board.

Softwares and its use: Following the instructions of Department of Official Language, Ministry of Home Affairs, Govt. of India, 'Unicode' software is being used in CSB and in all its main institutes, regional offices and other units. In addition, 'Leap Office 2000' is also being used in some of the CSB units/centres. CSTRI, Bengaluru has taken corporate licence of bank script software for preparing pay slip in bilingual in CSB Secretariat and accounting divisions of CSB.

Inspection: The Third Sub-Committee of Committee of Parliament on Official Language visited Central Sericultural Research and Training Institute, Pampore, J&K for inspecting official language Implementation on 11.06.2016. Regional Implementation Office, Bengaluru inspected NSSO, Bengaluru on 18.10.2016. Inspections pertaining to the implementation of Official Language were carried out in 44 attached and sub-ordinate offices of the Board by the Board Secretariat and its attached/sub-ordinate offices.

Translation: The Hindi Section of CSB Secretariat translated Training Courses for Sericulture Sector in CSB Calendar 2015-16, Background Note on Silk and Sericulture in Hindi, Point-wise replies of MoT/CSB on the list of points raised by the Parliamentary Standing Committee on Labour, Minutes of the Standing Committee Meeting and Board's Meeting, Annual Report 2015-16 and Certified Accounts with Audit Certificate and Audit Report for the year 2015-16.

Rolling shield award: In order to accelerate the tempo of implementation of official language in Board Secretariat and in its units, CSB has introduced Rajbhasha Rolling Shield Scheme, which envisages award for the best performing CSB Institutes/units in different categories during the year. CSB Secretariart, Bengaluru organized CSB Rajbhasha Rolling Shield distribution function for the year 2014-15 on 28.02.2017. The recipients of the award for the year were: Central Silk Technological Research Institute, Bengaluru; Central Tasar Research & Training Institute, Ranchi; Regional Sericultural Research Station, Sahaspur; Basic Tasar Silkworm Seed Organization, Bilaspur; Zonal Office, CSTRI, Bilaspur; Regional Tasar Research Station, Jagadalpur; Regional Office, Guwahati and Research Extension Centre, Bangriposi.

A provision for a separate Rolling Shield was also made for different sections of the Board Secretariat. Among the sections of the Board Secretariat, Publicity Section bagged the Rolling Shield while the Establishment Section received the citation for 2014-15. CTR&TI, Ranchi and BTSSO, Bilaspur organized Rolling shield distribution function on 14.09.2016 and 06.09.2016 for the year 2015-16 respectively and CSR&TI, Berhampore, CSTRI, Bengaluru also has introduced Rajbhasha Rolling Shield Scheme to boost the implementation of Official Language Policy in the main institute and in their respective units/sections.

Competitions: CSB Secretariat, Bengaluru organized an inter-office competition "What is the Right Term?" in coordination with TOLIC, Bengaluru at Town Level on 10.11.2016.

REGIONAL OFFICES OF CSB

Regional Offices (ROs) of CSB liaise with states and their Departments of Sericulture and nested units in their jurisdiction. They coordinate with these agencies regarding various sericulture development programmes implemented in respective states. CSB has 10 regional offices located at New Delhi, Mumbai, Kolkata, Jammu, Hyderabad, Bhubaneswar, Guwahati, Lucknow, Chennai and Patna. They are performing their roles and responsibilities as per the mandates.

In order to have a close monitoring and efficient functioning with proper coordination, the Regional Offices at New Delhi, Guwahati, Kolkata and Chennai have been decentralized and designated as Regional-cum-Zonal Offices to carry out the additional responsibilities of overseeing / monitoring the regional offices in their respective zones.

EXPORT-PROMOTION SCHEME

Pre-shipment Inspection

- Even after the compulsory pre-shipment inspection of natural silk goods meant for export has been dispensed with since 2000 as per the directions of the Ministry of Textiles, Govt. of India. CSB, however, continues to be one of the inspection authorities for natural silk goods to be exported from India and is undertaking voluntary quality inspection against payment of service charges prescribed by the Board. Various Tariff Certificates including GSP, Handloom Certificates, Carpet Labels, Certificate of Origin and Handicraft Certificates were issued by CSB on inspection of silk goods and on self-declaration by the exporters as well.
- Silk waste inspection and certification meant for export also forms a part of the services offered by the Board.
- 100% silk pile carpet inspection has been suspended w.e.f. 07-10-1999 as per the directions received from Ministry of Textiles, Govt. of India, New Delhi. However, CSB is undertaking carpets inspection under 'voluntary basis scheme' as an export promotion measure, wherever the exporter or importer makes a request to CSB.
- **Issue of Tariff Certificates:** To enable the foreign importers to avail duty free or concessional duty for the import of natural silk / mixed silk products into their country under the EXIM Policy and Bilateral agreements, various tariff certificates *viz.,* Handlooms and Handicraft Certificate to E.E.C., Handicraft Certificate to Australia, Austria, Switzerland, Tariff Certi-ficate, Certificate of Origin and other Special Certificate of origin to the U.A.E., Sri Lanka, Yugoslavia etc., are issued to goods inspected and certified for export and on the self declaration by the exporters, against payment of requisite fees. Handloom fabrics also enjoy a special privilege for duty concession at import destination offered by EEC Countries.
- **Testing facilities:** CSB extends testing services for checking silk quality, physical / chemical properties and other parameters through laboratories attached to Certification Centers of the Board and analysis of sample swatches of silk for identification of constituent yarns and its percentages, etc. CSB also extends technical assistance in identifying constituent yarns and percentage of silk content in products, as and when approached by different organizations like Customs Department, Directorate General of Foreign Trade, Directorates of Sericulture, textile institutes, private firms and individuals.
- During 2016-17, natural silk / mixed silk goods certified for exports by the Certification

Centers of CSB under 'Voluntary Quality Inspection Scheme' amounted to 13.938 lakh sq. mtrs. valued at Rs.179.974 crore (Table 3.5). Various Tariff Certificates such as GSP, Handloom Certificate, Handicrafts Certificate and Certificate of Origin etc., have been issued by the EPS section.

- A total revenue of Rs.16,61,825 has been generated under the scheme by way of inspection charges, sale of blank forms, sample testing charges and issue of various tariff certificates such as GSP, Certificate of Origin, Handloom Certificate, Handicrafts Certificate etc. (Table 3.6).
- A quantity of 54546 Sq.mtr. of silk goods valued at Rs.588.66 lakh exported by 100% Export Oriented Units (EOU) was certified by Certification Centre, Bengaluru during 2016-17.
- During the year, 42,271 kg of silk waste valuing Rs.244.968 lakh was certified by CSB offices at Hyderabad and Chennai (Table 3.7).

Table: 3.5 : Centre-wise details of natural silk goods certified under voluntary quality inspection scheme during 2016-17

Certification Centre	Silk fabrics certified (lakh sq. mtr.)	Value (Crore Rs.)
Mumbai	1.594	14.547
Bengaluru	9.135	56.970
New Delhi	1.466	79.093
Kolkata	1.025	6.798
Chennai		5.894
Varanasi	0.036	2.235
Srinagar	0.085	13.816
Hyderabad	-	0.441
Grand Total	**13.938**	**179.794**

Table 3.6: Revenue Generation from Certification Services during 2016-17

Certification Centre	Sale of Blank Forms	Issue of GSP	Issual of Tariff Certificates	Inspection Charges	Sample Testing Charges	Carpet Labels	Others	Grand Total
Mumbai	-	69650	350	9450	-	-	7000	86450
Bengaluru	25600	226800	178850	145800	216150	-	11600	804800
New Delhi	40000	69650	23100	68350	1100	283550	275	486025
Kolkatta	3400	53900	16100	23100	32100	-	-	128600
Chennai	-	10850	-	22150	-	50	1200	34250
Varanasi	100	2450	-	3500	7000	100	9000	22150
Srinagar	600	5950	4900	10150	-	75850	-	97450
Hyderabad	-	-	-	2100	-	-	-	2100
Grand Total	**69700.00**	**439250.00**	**223300.00**	**284600.00**	**256350.00**	**359550.00**	**29075.00**	**1661825.00**

Table 3.7: Details of silk waste certified by Certification Centre, Hyderabad and Chennai during 2016-17

Certification Centre	Quantity (Kg)	Value (Lakh Rs.)
Chennai	28954	200.890
Hyderabad	13317	044.078
Total	**42271**	**244.968**

MARKET DEVELOPMENT

Raw Material Banks (RMBs) for Tasar and Muga

CSB has set up Raw Material Banks for cocoons and by-products under Price Stabilization Scheme of Govt. of India on *no profit no loss basis* to support the primary growers and supply cocoons at steady price in tasar and muga sectors and also to protect the interests of rearers from exploitation by middlemen. They ensure right incentive for production, relieve the beneficiaries from wide fluctuations in market prices of cocoon and raw silk and provide off-the-shelf supply of essential raw materials to actual users and manufacturing exporters of silk goods at steady prices.

RMBs for Tasar at Chaibasa (Jharkhand) with four Sub-depots (Bhandara, Raigarh, Warangal and Bhagalpur) and for Muga at Sibsagar (Assam) with three Sub-depots ensure economic and fair price to the primary tasar and muga cocoon growers. The transaction details of tasar and muga cocoons made by RMBs during 2016-17 are given in Table 3.8.

Table 3.8: Performance of Raw Material Banks

(Unit: Qty. in lakh No. and Value in lakh Rs.)

Sector	Procurement of cocoons		Sale of cocoons	
	Quantity	Value	Quantity	Value
Tasar	200.76	287.10	171.68	229.88
Muga	1.55	2.77	1.55	2.92

D. Quality Certification System

One of the main objectives of the Quality Certification System is to initiate suitable measures towards strengthening quality assurance, quality assessment and quality certification. Under the scheme, two components *viz.,* "Cocoon Testing Units and Raw Silk Testing Units" and "Promotion of Silk Mark" are being implemented. Quality of cocoons influences the performance during reeling and quality of raw silk produced. Cocoon Testing Centres, established in different cocoon markets with the support under CDP, facilitate scientific cocoon testing.

CSB is popularizing Silk Mark labels, through the Silk Mark Organization of India (SMOI). "Silk Mark", a quality assurance label that protects the interests of the consumers from the traders selling blended and artificial silk products in the name of pure silk. The network of certification centres of CSB are carrying out pre-shipment inspection of natural silk goods meant for export from exporters who apply voluntarily for availing the inspection facility to ensure quality and purity of the natural silk goods exported from India. These offices are also multi tasking by carrying out the promotion of Silk Mark scheme, thereby, helping the consumers of pure silk products to get the value for their money and the stake holders of silk value chain, reap greater business. The progress achieved under the Quality Certification Systems (QCS) scheme during 2016-17 is given in Table 3.9.

Table 3.9: Progress achieved under QCS scheme

Particulars	2016-17	
Total No. of Authorised Users enrolled (No.)	Target	Achievement
Total No. of Silk Mark Labels sold (Lakh No.)	250	254
Awareness Programmes	25	25.53
Exhibitions/Fairs/Workshops/Road Shows (No.)	410	622
Cocoon Testing Centres (No.)	10	2

Export, Brand Promotion and Technology Upgradation

During XII Plan, a new component "Export/ Brand Promotion and Technology Upgradation" was conceived for the implementation by SMOI and Indian Silk Export Promotion Council. As a rationalization effort, this scheme was discontinued from 2015-16 and some of the components of the scheme were merged with the existing Quality Certification System of CSB for the remaining part of the plan period as per directives from the Ministry. Some of the promotional activities undertaken during the period are:

- SMOI has participated by putting up an exclusive theme pavilion to showcase the newly developed silk products and various activities of Silk Mark and CSB in the following international standard exhibitions:
  1. Hemtextil India 2016, 5th India International Silk Fair, Destination North East at Pragati Maidan, New Delhi and Destination Uttarakhand organized at Dehradun.
  2. 14th Pravasi Bharatiya Divas at Bengaluru International Exhibition Centre (BIEC), Bengaluru organized by the Ministry of External Affairs, Govt. of India in collaboration with the Government of Karnataka.
  3. XIII Agricultural Science Congress on "Climate Smart Agriculture" organized at Gandhi Krishi Vignana Kendra (GKVK), University of Agricultural Sciences (UAS), Bengaluru and in coordination with National Academy of Agricultural Sciences (NAAS), New Delhi.
  4. "Colour of Independence" to create awareness about the importance of Indian Independence was organized to coincide with the Independence Day celebrations. Huge cloth canvases were put up in important locations such as Lalbagh, CSB Secretariat, M.G. Road and Karnataka Chitrakala Parishath for the public to express their thought and ideas about the independence.
  5. Colourful logo of Silk Mark made from roses was displayed in the Glass House of Lalbagh during famous flower show by the Karnataka Horticulture Department, at Bengaluru as part of Republic Day celebration. More than 10 lakh visitors thronged the Lalbagh flower show and appreciated the concept of Silk Mark.
  6. 24th Congress on Sericulture and Silk Industry organized by International Sericultural Congress at Thailand and "Who's Next" at Paris.
  7. "North-East Investment Summit" - an exhibition jointly organized by CII, CSB and NEHHDC at Shillong, to demonstrate the major sericulture activities of CSB and availability of immense business and investment opportunities in silk sector in the North-eastern region.
- SMOI has organized Awareness prog-rammes, Workshops, Seminars etc., to spread the message of Silk Mark and CSB in the following locations:
  1. Dr. D.S. Kothari Auditorium, DRDO Bhawan, Rajaji Marg, New Delhi for the members of "IAS Officers Wives Association" (IASOWA). The members took active participation in exclusive live demonstration show of pure silk sarees selected from 12 different weaving clusters of the country.
  2. Designers Meet on the commercial utilization of Vanya silk products and design contest at Mumbai, Chennai and Guwahati for the young, budding designers and

students of fashion institutes using the Vanya Silk products.

3. In the third edition of Srimathi Silk Mark-Vizag at VUDA Children's Arena and Srimathi Silk Mark 2017- at Ravindra Bharathi Auditorium, Hyderabad to encourage the women empowerment on the eve of International Women's Day.

- To create more visibility in the capital city, SMOI has put up 15 hoardings of 20 x 10 ft (200 sq. ft.) and 100 tree guards at prominent locations of New Delhi.
- SMOI has undertaken a collaborative venture with Andhra Pradesh Handloom and Handicraft Corporation Ltd (Lepakshi), Govt. of Andhra Pradesh to promote exclusive Silk Mark store, "Resham Ghar - Home of Pure Indian Silks" and authorized users from different silk clusters as participants. This Store is having collections of pure silk merchandise from different clusters and caters to the consumer demands throughout the year. This Store is refurbished with new stocks of silk products and publicity through both print and electronic media has been arranged to augment its business turnover. The outlet has registered a record annual sale of Rs 1.10 crore during 2016-17.
- Bollywood celebrity Ms Vidya Balan has graciously agreed to promote Indian Silk in general and 'Silk Mark' in particular as its "Brand Ambassador" on honorary terms. The still photography, video film shooting, editing, dubbing in regional languages and other post-production work of the audio-visual promos have been completed. The campaign on promotional launch ads of Ms. Vidya Balan has been vigorously taken up in a systematic way both in print and electronic media. A 40 seconds video film of Silk Mark featuring Ms Vidya Balan has been widely publicized through multiplexes in major cities and through regional and national TV channels.
- SMOI has established a testing centre for silk stakeholders like consumers, weavers and traders in Sualkuchi, a silk weaving cluster located in Assam. The Centre was established as a collaborative venture with an NGO dedicated to the welfare of the weavers and traders of Sualkuchi. More than 7,750 samples have been tested for fibre purity and identification.

Silk Mark Expos

In order to ensure that Silk Mark gains further credibility and popularity, Silk Mark Expos are being organized across the country exclusively for Silk Mark Authorized Users. The expo is an ideal platform not only to popularize Silk Mark but also in bringing the manufacturers and the consumers under one platform for buying and selling of pure silk products. Substantial business for the participants is generated during this event, which is backed by massive awareness and publicity campaigns by the SMOI.

During 2016-17, expos were organized at Dibrugarh, Guwahati, Kolkata, Hyderabad, Bengaluru and Lucknow. Authorized users of Silk Mark like weavers, manufacturers, cooperative societies, retail traders from different clusters participated in the all the expos. An overwhelming response was seen and more than 43,500 consumers visited the expos and approximately Rs 7.40 crore business transactions took place in these expos.

VANYA SILK MARKET PROMOTION CELL

The activities under Vanya Silk Market Promotion Cell (VSMPC) include a special focus on generic, brand and market promotion of *Vanya Silk*

by organizing Vanya Silk expos, workshops, interaction meets, commercialization programmes, participation in expos, exhibitions, product development through collaborative projects and promotion of organic Vanya Silks.

Vanya Silk Expos

During 2016-17, VSMPC/P3D participated in three Silk Expos organized by SMOI at Bengaluru, Guwahati and Hyderabad with a special focus on brand and market promotion of Vanya Silks. This apart, a Vanya Silks Theme Pavilion was also organized and diversified Vanya Silk products were displayed to bring awareness among the consumers. In addition, VSMPC/P3D participated in the following exhibitions and displayed newly developed diversified products:

- ISC Congress at Bangkok – August 10 -14, 2016
- Who's Next Fair, Paris, France –September 2-5, 2016
- 5th India International Silk Fair, New Delhi - October 15 – 17, 2016
- North East Summit, Shillong - January 31- February 1, 2017
- 14th Pravasi Bharatiya Divas, Bengaluru- January 7 - 9, 2017
- Destination North-East, Chandigarh - March 6-8, 2017

Generic and Brand Promotion

The Vanya Silks has a registered logo which is being used in all the publicity material, hoardings, handbills and web-site. Wide publicity was given to this logo during the exhibitions through paper advertisement, hoardings and carry bags. Advertisements on generic and brand promotion of Vanya Silks were released in Silk Mark expos in association with SMOI. VSMPC has released advertisements in Indian Silk and Silk Mark Vogue magazines. The advertisements in respect of generic promotion of Vanya Silk were also released in popular magazines.

During the period, following new initiatives on generic and brand promotion of Vanya Silks were taken up in association with SMOI:

- Released 40 seconds visual advertisement in PVR Cinemas in all the metro cities (Bengaluru, New Delhi, Kolkota, Chennai, Guwahati, Mumbai and Hyderabad) through SMOI.
- Put up a flex advertisement in the bus shelter in 5 locations in Bengaluru.
- Released newspaper advertisements in English, Hindi and Kannada on sale promotion in Vanya Silk shoppees at Bengaluru and New Delhi.
- Printed new VSMPC brochure, folder and DVDs with Vanya product videos.

Commercialization of Vanya silk products

Organizing Interaction Meet

VSMPC/P3D in association with CSTRI and SMOI, organized interaction meets at Guwahati on July 29, 2016, Tirupur on October 6, 2016, Mumbai between January 24 – 25, 2017 at NIFT Mumbai and SVT College of Home Science and at Chennai on February 19, 2017. The designers, boutique owners, manufacturers, traders and exporters participated in the interaction meets. The newly developed diversified products were displayed and the following presentations were made:

- "Vanya Silk - Products Development and Commercialization" by Shankar Kotrannavar, Assistant Director (Inspection), VSMPC.
- "Product Development Opportunities and Possibilities" by S.A. Hipparagi, Scientist-D CSTRI, Bengaluru.

In Mumbai, prior to the interaction meet, a designer competition was organized involving 45

budding designer students from 15 Fashion Design Institutes in Mumbai and Pune. The Vanya silk fabrics of different varieties were provided to the students in the design competition. The garments designed by the students were evaluated by the Jury. The garments were displayed by the students on a ramp walk organized during the interaction meet and the best three designs were awarded.

After the interaction meet, the students from NIFT, Mumbai approached for internship programme in knitwear development and the same was sponsored by CSB. The manufacturers, designers and boutique owners have approached for technical details / samples of few products for commercialization.

Collaborative Projects with external agencies

A collaborative project on "Development of Silk Knitwear on Seamless Technology" by NIFT-TEA, KFI, Tirupur at a total budget of Rs. 3.40 lakh was sanctioned during 2015-16 and funds were released. The project concluded during 2016-17. Further, the following collaborative projects have been sanctioned and implemented during 2016-17.

Collaborative Project with NIFT-TEA KFI, Tirupur: A collaborative project entitled "Commercialization of eri silk knitwear's" at the budget of Rs. 5.50 lakh is under implementation and the following activities were carried out under the project during 2016-17:

- CSB and NIFT-TEA organized an interaction meet with around 40 knitwear manufacturers.
- NIFT-TEA has identified 5 knitwear manufacturers for product development and commercialization.
- NIFT-TEA, VSMPC and CSTRI team visited the commercialization partners and discussed in detail the module of the project.
- Eri silk and blended yarn required for the project was procured and distributed to the identified beneficiaries.
- NIFT-TEA is coordinating and providing technical know how on knitting and processing of eri silk.
- The commercialization partners developed the knitted fabrics.

Collaborative project with Indian Institute of Science (IISc), Bengaluru: The IISC has taken up a "Study on demand for Vanya Silk products in the non-traditional market". IISC has completed the study and presented the final draft report on its findings to CSB Officers on March 20, 2017. Based on the suggestions of the CSB Officers, IISC will prepare and submit the final report to CSB with its findings and recommendations.

Development and Commercialization of Hand woven eri silk denim fabric in North-East: An exploratory work was taken up to develop eri silk denim fabric on handloom with locally produced eri silk yarn available in North-East. Around 20 mtr. of handloom fabric was woven on handloom, converted into garments and displayed in Silk Mark Expo, Guwahati. The products were appreciated and local weavers and entrepreneurs showed a keen interest in its production and commercialization.

Vanya Silk Shoppees: Two Vanya Silk shoppees in New Delhi and one in Bengaluru continued to function with improvement in sales turnover. During 2016-17, the shoppees were allotted to new beneficiaries who are primary producers of Vanya silk and authorized users of Vanya silk logo, as well. Wide publicity has been given to Vanya silk shoppee through print media; website etc., for sales promotion and regular maintenance undertaken. Support was also extended in preparing suitable advertisement, providing linkages with designers, boutiques and bulk consumers etc. The diversified products developed under VSMPC / P3D are commercialized through shoppees.

Promoting Organic Silk: The Vanya silk manufacturers are being encouraged in promoting Vanya silks as organic silks and VSMPC has been facilitating the agencies with relevant information to get accreditation of organic / eco silk. The information in the form of CD was provided to the Vanya silk logo authorized users for reference and further necessary action.

Indian Standards for Organic Textiles (ISOT): Standards for silk were included in ISOT published under National Programme for Organic Production by Dept. of Commerce, Ministry of Commerce and Industries, New Delhi.

Interaction with manufacturers, traders, exporters, designers and consumers: The VSMPC has been continuously interacting with manufacturers, traders, exporters, designers and consumers during expos; events etc., and bring in awareness about the Vanya Silk products, their comfort characteristics, availability and production process and obtain feedback. VSMPC also provides backward and forward linkages to the entrepreneurs, manufacturers, traders and exporters.

Product Design Development and Diversification (P3D)

The activities under Product Design, Development & Diversification (P3D) covers special focus on fabric engineering, silk blends, designing new fabric structures, design and development of new products in silk and silk blends, product development in the clusters, commercialization of new products developed, assisting the commercializing partner in providing backward linkage, technical know-how and assisting / coordinating in sample development.

Product Development: During 2016-17, the following fabrics were engineered:

- **Cross Colour Crepe fabric:** Using the ARM reeled international grade bivoltine mulberry yarn, cross-colour crepe sarees were developed. The newly developed sarees have been commercialized through M/s. Krishna's, Bengaluru.
- **Eri denim on handloom:** Eri denim fabric using 2/80s and 2/120s eri spun yarn has been developed on handloom at Erode (Tamil Nadu) in plain and self-design styles. Designers and retailers have shown interest in commercialization and collected the sample from P3D against depositing the cost price.
- **Uppada cluster mulberry saree using muga silk**: In order to create demand in niche market as a product diversification, P3D identified the manufacturers at Uppada cluster and developed mulberry saree using muga yarn in the design instead of pure jari.

Collaborative projects on Product Development with other Institutes

During 2016-17 following collaborative projects with different institutes and organizations were initiated and P3D Cell has provided technical details and financial assistance under P3D–CSS scheme:

- **Product development and diversification in Chanderi silk weaving cluster with NIFT Bhopal:** Under this project, 18 sarees (traditional and modern designers), 20 garments and textile accessories were developed. The newly developed sarees were released by the Union Minister of Textile for commercialization through M/s Mriganayanee, Madhya Pradesh.
- **Design Intervention and Diversification in Lambani Embroidery - A Contemporary approach in Chintamani Cluster:** Contemporary ideation, product development and

diversification with NIFT Bengaluru was initiated and completed during the year. Under the project, garments and home furnishing items were developed using the technique of Lambani embroidery and mirror works.

- **Development of silk knitwear products / garments using Indian silk of international grade with CSTRI Bengaluru:** In the project, knit wears will be developed through Tirupur cluster exporters using Indian Silks.

Participation in Exhibitions

During the period under report, the P3D cell participated in different Expos, B2B meets like Vanya-SMOI expos, Pravasi Bharthi Diwas at Bengaluru, 5th India International Trade Fair at New Delhi, North-East Summit at Shillong and 13th Agricultural Science Congress on Climate Smart Agriculture at Bengaluru. In the exhibitions, P3D Cell arranged the theme pavilion and displayed newly developed products.

Students from NIFT, Chennai and Bhubaneswar took up the internship programme at P3D for a period of eight weeks and developed / designed garments and Batik sarees.

Glimpses of New Products by P3D/VSMPC

Mulberry silk saree developed in Uppada cluster using muga silk in designing

Eri silk denim fabric developed on handloom

Tasar & Eri Dress developed by young design student - Design competition in Mumbai

Chanderi silk sarees using Mulberry and Vanya spun silk

Muga life style products

Implementation of Scheduled Caste Sub-Plan (SCSP)

A Project entitled "Empowerment of Scheduled Caste families through Sericulture" under Scheduled Caste Sub-Plan (SCSP) was implemented in coordination with State Sericulture Departments and other implementing agencies. The objective of the project includes social upliftment of SC families on sustainable basis with a visible impact in terms of income generation and employment through sericulture. During 2016-17, the project covered 1175 SC beneficiaries in Andhra Pradesh, Bihar, Himachal Pradesh, Jammu & Kashmir, Kerala, Madhya Pradesh, Tamil Nadu and Uttarakhand and an amount of Rs.22.73 crore was released to the states. The project envisaged to support SC families through mulberry sericulture as indicated below:

- Support for development of Kisan nursery
- Support for raising systematic mulberry plantation
- Irrigation facilities to mulberry plantations preferably with solar pumps
- Vermi-compost units for organic farming
- Scientific rearing house and equipments
- Promotion of solar lights for feeding mulberry silkworm during night
- Establishment of Chawki Rearing Centres
- Door-to-door service agents for disinfection and inputs supply
- Sericulture Resource Centres
- Establishment of reeling / twisting infra-structure
- Support for construction of reeling shed
- Skill upgradation and capacity building of the stakeholders

This apart, support was also provided to eri growing farmers in Bihar.

Implementation of Tribal Sub-Plan

Another project entitled "Empowerment of Scheduled Tribe families through Sericulture" under Tribal Sub-Plan (TSP) was implemented in coordination with State Sericulture Departments and other implementing agencies during 2016-17. The aim of the project was to empower down-trodden ST families through various activities of tasar and mulberry sericulture. The project covered 3263 ST beneficiaries in Andhra Pradesh, Bihar, Chhattisgarh, Jammu & Kashmir, Jharkhand, Maharashtra, Odisha, Telangana, Uttarakhand and West Bengal. An amount of Rs.8.50 crore was released to the states to support ST families through various activities of tasar and mulberry sericulture under TSP during 2016-17, as indicated below:

Tasar Sector

- Support to nucleus, basic and commercial seed rearers, including crop and rearers' insurance
- Assistance to private graineurs for commercial seed production
- Assistance to basic seed production units for basic seed production
- Assistance to producer groups for cocoon storage / conversion, equipment, common facilities and working capital
- Assistance towards maintenance of existing tasar plantation.

Mulberry Sector

- Certified Kisan nurseries
- Raising of systematic plantation in new areas
- Irrigation facilities to mulberry plantations preferably with Solar pumps

- Vermi-compost units for organic farming.
- Scientific rearing house and equipments
- Establishment of Chawki Rearing Centres
- Door-to-door service agents for disinfection and inputs supply.
- Sericulture Resource Centres

General

- Promotion of Solar lighting
- Establishment of reeling/ twisting/ spinning infrastructure
- Skill upgradation and capacity building of the stakeholders
- Nurturing and engaging Community Resource Persons and Para-professionals
- Information, Education and Communication Strategy
- Institution building of Producer groups and collectives
- Project implementation and monitoring costs

BIVOLTINE SERICULTURE IN INDIA

The foremost thrust of the XII Five year plan (2012-13 to 2016-17) is to augment the production of import substitute quality silk in the country by increasing the production of bivoltine silk to 5,000 MT. To achieve the target, CSB, in association with state sericulture departments has organized 174 bivoltine clusters to produce about 3,400 MT of bivoltine silk during XII Plan, besides, concentrating on non-captive areas to produce remaining 1,860 MT.

The year-wise bivoltine raw silk production during XII Plan period indicating the progressive increase in the bivoltine raw silk production as an impact of Cluster Promotion Programme is given Table 3.10.

Table 3.10: Bivoltine Raw Silk Production during XII Five Year Plan Period

Year	Raw Silk Production Target (MT)	Achievement (MT)	% Achievement against set target	% increase over previous year
2012-13	2100	1984	94	-
2013-14	2480	2559	103	28.98
2014-15	3500	3870	111	51.23
2015-16	4500	4613	103	19.20
2016-17	5260	5266	100	14.20

With the joint concerted efforts of CSB and DoSs, the production of bivoltine raw silk in the country has reached 5266 MT during the year registering a growth rate of 14.20%. Out of the total production of over 5,266 MT, the contribution of 174 bivoltine clusters was about 3,400 (65%) MT under CPP. A database of farmers covered under the Cluster Promotion Programme is maintained in CSB web-portal seri5k.csb.gov. in and the cluster performance being monitored and reviewed at CSB Secretariat. The details of zone-wise and state-wise progress of bivoltine silk production for the year 2016-17 given in Table 3.11.

Table 3.11: Zone-wise and state-wise progress of bivoltine silk production during 2016-17

Sl. No.	State/Zone	No. of Clusters	Output raw silk (MT) during 2016-17			Ranking
			Captive (Clusters)	Non-captive (outside clusters)	Total	
I	**Southern Zone**					
1	Karnataka	46	1240	248	1488	2
2	Andhra Pradesh	13	806	250	1056	3
3	Telangana	4	89	16	105	7
4	Tamil Nadu	28	890	737	1627	1
5	Kerala	2	9	2	11	17
6	Maharashtra	9	131	97	228	4
	Total (I)	102	3165	1350	4515	
II	**North-western Zone**					
7	Jammu & Kashmir	25	50	95	145	6
8	Uttarakhand	7	10	21	31	14
9	Haryana	0	0	1	1	23
10	Himachal Pradesh	8	30	2	32	13
11	Punjab	1	2	1	3	22
	Total (II)	41	92	120	212	
III	**Central-western Zone**					
12	Chhattisgarh	0	0	0.32	0.32	25
13	Madhya Pradesh	5	24	6	30	11
14	Uttar Pradesh	10	37	60	97	8
	Total (III)	15	61	66.32	127.32	
IV	**Eastern Zone**					
15	Bihar	1	Neg	6	6	24
16	Odisha	3	1	2	3	20
17	West Bengal	4	32	6.4	38.4	12
	Total (IV)	8	33	14	47	
V	**North-eastern Zone**					
18	Assam/Bodoland	3	10	42	52	9
19	Arunachal Pradesh	0	0	2	2	21
20	Manipur	1	20	129	149	5
21	Mizoram	1	6	41	47	10
22	Meghalaya	0	0	28	28	15
23	Nagaland	1	6	1	7	18
24	Sikkim	0	0	6	6	19
25	Tripura	2	7	68	75	16
	Total (V)	8	49	317	366	
	Grand Total (I) to (V)	**174**	**3400**	**1867**	**5267**	
	65% raw silk production through clusters					

PROGRAMMES / PROJECTS

Institute Village Linkage Programme (IVLP)

For effective transfer of technology from lab to land and to establish Seri Model Villages (SMV), CSB has been implementing the Institute Village Linkage Programme (IVLP) through its main R&D institutes since 2014-15. The major activities of IVLP are as follows:

- Identify domains for new technology requirement at macro and micro levels.
- Introduce technological interventions with emphasis on stability and sustainability along with productivity of small farm production system.
- Introduce and integrate appropriate technologies to sustain technological interventions and their integration to maintain productivity and profitability, considering environmental issues.
- Facilitate adoption of appropriate on-farm value addition of agricultural products, by-products and wastes for greater economic dividend.
- Facilitate adoption of appropriate technologies for removal of drudgery, increase efficiency and higher returns from seri-activities.
- Monitor socio-economic impact of the technology intervention.

A total of 5,585 farmers are covered under the programme of which, 3,573 farmers are under 27 mulberry clusters and 1,712 farmers under 21 vanya clusters and 300 beneficiaries under post-cocoon sector being implemented by nine research institutes. The results in the above clusters were encouraging with good impact of 30-40% increase in average yield of bivoltine cocoon production over the benchmark production level which contributed to the increased bivoltine production in the country. It is expected that the benefits of the programme would encourage the farmers of the adjoining areas to adopt these latest technologies in the coming years that will eventually help in percolation of scientific practice of sericulture on a wider scale. It has been decided to continue the programme for the next three years from 2017-18.

North-East Region Textile Promotion Scheme (NERTPS)

In order to boost the textile sector in the NE region, the Govt of India has approved a project-based strategy for the North-East Region under an umbrella scheme by name "North- East Region Textile Promotion Scheme". The expenditure under this scheme will be met from the 10% budget outlay earmarked for the North-eastern states by the Ministry of Textiles. The broad objective of NERTPS is to develop and modernize the textile sector in the North-East region by providing the required government support in terms of raw material, seed banks, machinery, common facility centres, skill development, design and marketing support etc.

Under NERTPS, 24 sericulture projects have been approved under two broad categories *viz.,* ISDP and IBSDP covering mulberry, eri and muga sectors in all NE states. The projects aim at holistic development of sericulture in all its spheres from plantation development to production of fabrics with value addition at every stage of production chain. These projects have been approved at a total cost of Rs.819.19 crore with GoI share of Rs.690.01 crore for implementation from 2014-15 to 2018-19. These projects are expected to contribute additional production of 2,285 MT of raw silk during the project period and 1,100 MT of raw silk per annum involving 33,550 families, which will generate employment to 1,67,700 persons. The details of ISDP and IBSDP projects status are as follows:

Integrated Sericulture Development Project (ISDP)

Under ISDP, 16 sericulture projects have been approved with a total cost of Rs.582.42 crore (GoI share of Rs.479.60 crores) for implementation in 8 NE States *viz.,* Assam, BTC, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland and Tripura from 2014-15 to 2018-19. This includes setting up of silk printing and processing unit for Tripura, Soil to Silk for BTC and PCT for Nagaland. While 15 projects are meant for implementation by states to consolidate the NE efforts to strengthen the existing facilities including support for infrastructure creation at farmers, seed cocoon producers, reelers and weavers level in identified areas, one project is meant for creation of seed infrastructure for CSB to produce and supply quality seed to NE states.

Upto March 2017, 3,114 ha of plantations have been developed against the project target of 4,100 ha under mulberry, eri and muga sectors by involving 9,507 beneficiaries against the target of 24,798 beneficiaries. During this period, 1,216 MT raw silk was produced in the project areas against the target of 2,076 MT. The Ministry has released Rs.249.78 crore for the above project, against which the expenditure reported is Rs.164.46 crore (66%) (Table 3.12).

Table 3.12: Details of Integrated Sericulture Development Project (ISDP) under NERTPS

Sl. No.	State	Total Cost (Rs. Cr.)	GoI share (Rs. Cr.)	GoI Release till date (Cr.)	Benef. to be covered (No)	Output during Project (MT)
1	Assam	66.67	47.42	26.73	3,265	196
2	BTC	34.92	24.68	15.62	1,576	171
3	BTC (IEDPB)	11.41	10.61	2.29	500	60
4	BTC (Soil to Silk)	51.61	49.37	9.41	3000	245
5	Arunachal Pradesh	18.42	18.42	17.50	1,362	79
6	Manipur (Valley)	149.76	126.60	38.08	2,896	450
7	Manipur (Hill)	30.39	24.67	13.01	1,514	68
8	Meghalaya	30.16	21.91	13.87	1,466	162
9	Mizoram	32.49	24.49	21.85	1,811	117
10	Mizoram (IMSDP)	13.52	12.83	8.13	600	15.86
11	Nagaland	31.47	22.66	21.52	1,898	166
12	Nagaland (IESDP)	13.66	12.83	1.90	1000	72
13	Nagaland (PCT)	8.57	8.48	2.69	400	Post-cocoon and post-yarn activities
14	Tripura	47.95	33.20	21.02	3,510	275
15	Tripura (Printing)	3.71	3.71	3.16	----	1.50 lakh mts./yr
16	Mulberry & Vanya Seed Infrastructure under CSB	37.71	37.71	32.99	----	30 lakh mulberry & 21.50 lakhs muga/eri dfls/yr
	Total	**582.42**	**479.60**	**249.78**	**24,798**	**2,076**

Intensive Bivoltine Sericulture Development Project [IBSDP]

Eight projects on Intensive Bivoltine Sericulture Development Project (IBSDP) for all NE states (except Manipur) with a total cost of Rs.236.78 crore (GoI share of Rs.210.41 crore) have been approved for implementation from 2015-16 to 2017-18. The project aims at production of international quality bivoltine silk to substitute import in the coming years. The project envisages to cover 200 ha. under mulberry plantation in 2 blocks at each cluster involving approximately 1,100 women beneficiaries per state including weavers. Overall, it aims to cover 4,000 acres of mulberry plantation around 8,750 women beneficiaries in eight clusters of NE states. Social Mobilization and Women Group Formation along with supporting interventions for plantation development and infrastructure creation are integral part of the projects. These projects are presently under implementation in respective states.

Upto March 2017, 1,000 ha of mulberry plantations were developed against the project target of 1,600 ha by involving 3,440 beneficiaries against the target of 8,750 beneficiaries. The raw silk production was 30 MT against the project target of 209 MT. The Ministry has released Rs.110.07 crore for the above project, against which the expenditure reported is Rs.80.15 crore (73%) (Table 3.13).

Table 3.13: Details of Intensive Bivoltine Sericulture Development Project (IBSDP) under NERTPS

Sl. No.	State	Total Cost (Rs. Cr.)	GoI share (Rs. Cr.)	GoI Release till date (Rs.Cr.)	Benefit to be covered (No.)	Raw Silk Output during Project (MT)
1	Assam	29.55	26.28	14.26	1,100	29
2	BTC	30.06	26.75	15.35	1,200	26
3	Ar. Pradesh	29.47	26.20	14.23	1,100	20
4	Meghalaya	29.01	25.77	14.91	1,000	27
5	Mizoram	30.15	26.88	15.70	1,100	26
6	Nagaland	29.43	26.16	15.13	1,100	27
7	Sikkim	29.68	26.43	5.50	1,050	27
8	Tripura	29.43	25.95	14.99	1,100	27
	Total	**236.78**	**210.41**	**110.07**	**8,750**	**209**

PROJECTS WITH FUNDING FROM OTHER ORGANIZATIONS

Japan Overseas Cooperation Volunteers (JOCV)

CSB has implemented JOCV programme in cooperation with JICA since 07.01.2015 for a period of two years in the field of extension methodology in organizing Self-Help Groups/ CBOs by involving sericulturists for effective technology transfer in bivoltine clusters. Six JOCVs have been posted in cluster locations in Karnataka (1), Tamil Nadu (1), Andhra Pradesh (2) and Uttarakhand (2).

Vanya Cluster Promotion Programme (VCPP)

CSB, under XII Plan, has envisaged implementation of Vanya Cluster Promotion Programme (VCPP) for organized development of vanya sericulture with a view to address the critical gaps in seed production and supply, improve cocoon productivity and quality of vanya silk through technological interventions, input support and capacity building of stakeholders. 22 clusters in tasar sector were identified for implementing the VCPP. Benchmark survey and diagnostic studies were completed by the Cluster Development Facilitators (CDFs) nominated by CSB and States to these clusters. The VCPP is implemented jointly by CSB units in close coordination with concerned State DOS by utilizing the funds allocated under the restructured Central Sector Scheme (CSS). The VCPP is implemented in the following 22 clusters (Table 3.14):

Table 3.14: Vanya Clusters

Sl. No.	Institutes linked	State	Name of the Tasar cluster
1	CTRTI, Ranchi	Jharkhand	Mohanpur, Deoghar
2			Jharmundi, Dumka
3			Ramgarh, Dumka
4			Bandhgaon, West Singhbhum
5			Majhgaon, W. Singhbhum
6			Boarijore, Godda
7		Odisha	Thakurmunda-Mahuldiha-Kendujuani, District- Mayurbhanj
8			Baincha-Jalghati-Dantiamuhan, District -Mayurbhanj
9		Telangana	Mahadevpur, Karimnagar
10		Andhra Pradesh	Kunavaram, Khammam
11		Maharashtra	Nisti, Tahsil- Pavani, Bhandara
12		West Bengal	Kashipur, Purulia
13		Uttar Pradesh	Bundelkhand, Jhansi
14	BTSSO, Bilaspur	Jharkhand	Barhet, Sahibganj
15			Jhinkapani, Chaibasa
16			Jagdishpur, Deogarh
17			Rajnagar, Saraikela/ Kharsawan
18		Odisha	Telkoi-Benhamunda, District -Keonjhar
19			Jeenari-Pardapada, District-Keonjhar
20		Madhya Pradesh	Narsinghpur
21		Uttar Pradesh	Mungadih, Sonbhadra
22		Chhattisgarh	Ambikapur

Each cluster is proposed to cover 180 to 200 beneficiaries based on the potential and topography in the cluster to build backward and forward linkages for self-sustainability as well as to support stakeholders of nearby areas for seed, to develop them as demonstrable models for development of vanya silk. Following major interventions are undertaken in the clusters:

- Organize the stakeholders to undertake different tasar activities in clusters.
- Organize seed production in private sector to cater to the needs of increased raw silk production target.
- Productivity improvement through maintenance of existing vanya host plants, disease monitoring and remedial measures.
- Transfer of improved technologies to the farmers and skill upgradation and training of stakeholders in proven technologies in the areas of seed production and rearing activities, etc., as per need of the cluster.
- Strengthen backward and forward linkages for silkworm seed production, cocoon processing, etc.
- Infrastructure development in private sector especially for silkworm seed production and cocoon processing.
- Community building for the integrated development of vanya silk by improving the group activity / capacity building.
- Disease monitoring through Joint Disease Monitoring Squads.

During the year, 1226 beneficiaries were covered under capacity building, exposure visit, door-to-door and awareness programme on technology transfer service under the programme. Further a total of 1.79 lakh dfls were brushed by ASRs in seed crop (1st crop) and 47.75 lakh seed cocoons were produced. These seed cocoons were processed by 125 private graineurs to produce 5.0 lakh dfls, of which 3.41 lakh dfls were reared by commercial farmers in second crop (commercial) in the clusters and produced 87.35 lakh cocoons. Remaining 1.59 lakh seed was supplied to the commercial farmers outside the clusters.

Convergence

The Ministry of Textiles is extending support to the sericulture sector in the form of CSS and NERTPS. Efforts are made further by mobilizing additional funds through convergence, by availing the benefits from the schemes like MGNREGS, RKVY, etc., being implemented by other ministries of Govt of India/ states. CSB facilitated the state governments for preparation and submission of convergence projects for developing plantations and infrastructure and monitored the progress. During 2016-17, the states have submitted 163 proposals for Rs.935.08 crore and received sanction for an amount Rs.900.58 crore for 128 proposals and funds worth Rs.519.37 crore as per details given at Annexure-III.

Project for Sericulture Development in Tribal Areas under Tribal Sub-Plan (TSP)

Projects at an outlay of Rs.20 crore for each year for promotion of tasar under Tribal Sub Plan (TSP) of the Ministry of Textiles, Govt. of India during the period between 2015-16 and 2016-17 were approved by EFC, in the states of Jharkhand, Odisha, Chhattisgarh, Telangana and West Bengal. Projects were proposed, to take up seed augmentation and rearing activities at block and states levels supporting plantations, convergence, extension support, infrastructure and manpower support, facilitating backward and forward linkages, marketing etc. Details of beneficiary coverage, sharing pattern and project output are depicted in Table 3.15.

CSS funds amounting to 20.0 crore was released during 2015-16. Besides, some additional proposals submitted by states under CSS were considered under TSP for which funds amounting to Rs. 4.566 Cr have been released during 2016-17 as per details given in Table 3.16.

Table 3.15: Details of beneficiary coverage, sharing pattern and project output under TSP

Sl. No.	State	Beneficiary coverage	Sharing Pattern (Rs. in Lakh)			Commercial dfls produced (lakh)	Total raw silk production (MT)	Total tasar spun silk production (MT)
			Ben.	Grant	Total			
1	Jharkhand	1966	24.000	1193.553	1217.553	4.400	14.993	5.761
2	Odisha	1966	24.000	1052.121	1076.121	4.400	14.993	5.761
3	Chhattisgarh	1966	24.000	1052.121	1076.121	4.400	14.993	5.761
4	West Bengal	492	6.000	285.395	291.395	1.100	3.748	1.440
5	Telangana	732	9.000	416.810	425.810	1.500	5.610	2.123
	Total	**7122**	**87.000**	**4000.000**	**4087.000**	**15.800**	**54.337**	**20.846**

Table 3.16: Release of CSS funds to the states

(Rs in Lakh)

Sl. No.	States	Fund Released (Rs. in Lakh)	
		2015-16	2016-17
1	Andhra Pradesh	-	270.22
2	Telangana	126.54	98.00
3	Uttarakhand (Oak Tasar)	0.63	16.05
4	Chhattisgarh	43.85	72.36
5	Jharkhand	693.03	-
6	Odisha	992.26	-
7	West Bengal	92.84	-
8	Maharashtra	25.00	-
9	Madhya Pradesh	5.33	-
10	Bihar	20.52	-
	Total	**2000.00**	**456.63**

As the fund was released during the last quarter after the crop season got over, states have taken up baseline survey, inception workshops and planning for various activities in the ensuing year.

MKSP Projects for Tasar Development

Building on the successful models developed under special SGSY Projects in Bihar and Jharkhand for replication, the CSB and the Ministry of Rural Development (MoRD) came up with projects for tasar development for the states of Jharkhand, Odisha, West Bengal and Chhattisgarh in coordination with PRADAN, in Maharashtra and with BAIF, Pune, in Andhra Pradesh and in Telangana with SERP and Kovel and in Bihar in coordination with BRLPS and PRADAN. The projects propose to create over 36,000 sustainable livelihoods for the marginalized households, especially women belonging to Scheduled Tribes in selected 23 districts of eight states, which are mostly Left Wing Extremism (LWE) affected. It is also proposed to rejuvenate 9468 ha of natural flora, to raise 3503 ha of block plantations and nurture 478 community resource persons. The multi-state project in Jharkhand, Odisha, West Bengal, Chhattisgarh and Maharashtra will be concluded by March 2018.

CSB is responsible for providing technical inputs and training of field staff of the NGO partners through its field units in various sectors *viz.*, seed, pre-cocoon and post-cocoon. Being the coordinating agency, CSB would receive funds from the Ministry of Rural Development, GOI and transfer to the Project Implementing Agencies (PIAs) as per the requisition received from the PIA and Action Plan (Table 3.17).

Table 3.17 : State-wise details of MORD and CSB share and their utilization

Sl. No.	Project State	Total MoRD share	MoRD share received (75%)	MoRD share released to PIAs	UC submitted by PIAs	Total CSB share	CSB share released to PIAs (2013-14)	UC submitted by PIAs	Balance CSB share to be released
1	Jharkhand	1795.46	1346.625	1141.041	701.894	598.487	411.399	397.875	187.088
2	Chhattisgarh	598.73	449.025	364.996	222.696	204.256	148.398	129.935	55.858
3	Odisha	358.586	268.950	228.414	133.165	119.447	103.102	102.890	16.345
4	West Bengal	400.400	300.300	254.571	143.795	133.598	117.848	117.470	15.75
5	Maharashtra	759.800	569.850	464.596	264.564	253.211	171.693	152.626	81.518
6	AP/ Telangana	784.04				262.668	62.498	62.498	200.17
7	Bihar	669.43				223.145	115.083	76.888	108.062
	Total	**5366.446**	**2934.750**	**2453.618**	**1466.114**	**1794.812**	**1130.021**	**1040.182**	**664.791**
MoRD Funds are released directly to PIAs.									

MoRD has released 75% of its share (Rs. 29.34 crore) to CSB under multi-state project, of which Rs. 24.536 crore has been released to the PIAs (PRADAN and BAIF), of which Rs.15.028 crore has been utilized (43.05%). MoRD share is released directly to BRLPS and SERP in respect of Bihar, AP and Telangana projects, respectively. CSB has also released a total amount of Rs.11.300 crore (CDP share) to all the PIAs including SERP, of which Rs.10.40 crore has been utilized.

Physical Progress-Multi-State Project

Project coverage: As on March, 2017, 24,226 farmers were covered against the target of 25479 including 19113 STs (78.89%), 1000 SCs (4.13%) and 4113 minorities (16.98%) under the project since inception. Of the above, 625 revenue villages, 38 blocks and 21 districts of the Project states were covered.

Augmentation of tasar host plants: 2453 mahila kisans established 1340.04 ha. of tasar host plants in private waste lands through seedlings raised by them in kisan nurseries. Progress was slow as this activity was dovetailed to MGNREGS and project funds were not utilized for the purpose.

Seed rearing and seed augmentation: Under the seed cocoon production 1520 seed rearers brushed 4.574 lakh dfls of basic seed procured from BTSSO and BSPUs established under special SGSY Projects, to produce 142.31 lakh seed cocoons. 268 nucleus seed rearers brushed 87000 dfls of nucleus seed to produce 49.362 lakh seed cocoons @ 56.73 seed cocoons per dfl. 199 private graineurs processed 98.545 lakh seed cocoons and produced 21.7873 lakh commercial dfls @ cocoon:dfl ratio of 4.5:1 and 8869 commercial rearers brushed 21.98 lakh dfls procured from the private grainages of MKSP/special SGSY projects/ DOSs, to produce 847.20 lakh reeling cocoons.

Capacity building and institution building: Under human resource programme various capacity and institution building training programmes were organized under the project. Major ones being the Technical training (19539 nos.), training on sectoral activities *viz.,* sustainable agriculture, vegetable cultivation etc., (19064 nos.), Community Resource Persons(CRP) training (887 nos.), on-field training to CRPs (32957 nos.), etc. Further, 3171 mahila kisans were taken on exposure visits (under producer collectives) and 2 trainers training programme were conducted. Six training modules for various HRD activities and technical protocol were prepared and submitted to NRLM, under the project. Also, 530 producer groups were organized of which 20 were federated.

Physical Progress: AP and Telangana (As on 30.09.2016)

Project coverage: 4574 farmers were covered against the target of 2153 including 3574 STs (78.14%), 470 SCs (10.28%) and 530 minorities (11.59%) under the project since inception. Of the above it included 67 revenue villages, 22 blocks and 5 districts of the project states.

Augmentation of tasar host plants: 173 mahila kisans established 136.40 ha of tasar host plants in private waste lands through seedlings raised by them in kisan nurseries.

Seed rearing and seed augmentation: 35 nucleus seed rearers brushed 7000 dfls of nucleus seed to produce 2.556 lakh seed cocoons @ 36.51 seed cocoons per dfl. Under the seed cocoon production, 239 seed rearers brushed 1.016 lakh dfls to produce 14.65 lakh seed cocoons. 16 private graineurs processed 12.26 lakh seed cocoons and produced 2.89 lakh commercial dfls @ cocoon:dfl ratio of 4.2:1 and 1416 commercial rearers brushed 5.98 lakh dfls procured from the

private grainages of MKSP/special SGSY projects/ DOSs, to produce 82.052 lakh reeling cocoons.

Integrated Soil to Silk Tasar Project in Janjgir-Champa district of Chhattisgarh

As per the decisions taken in the meeting conducted by the Joint Secretary (Silk) with the CSB officers on 7th April, 2016 at New Delhi, a soil to silk tasar project in Janjgir-Champa Cluster of Chhattisgarh was prepared with a total financial outlay of Rs.68.529 crore for a period of three years, (2016-17 to 2018-19). The project envisages GoI share of Rs.22.88 crore, state share (State Plan and MGNREGS) of Rs.35.68 crore and beneficiary contribution of Rs.1.31 crore. The GoI share of Rs.22.88 crore is proposed to be met from the general CSS schemes of CSB. The project envisages developing new block tasar plantations in 2,500 hectares of land in the project area and maintenance of 2,000 ha of existing block plantations in forest/community land, besides, support for building forward and backward linkages to facilitate basic and commercial seed production, supply of rearing appliances and disinfectants for disease management to tasar rearers for ensuring crop productivity, cocoon storage facilities, reelers collectives, cocoon bank and marketing support in the project area.

The interventions proposed under the project are estimated to increase cocoon production from present level of 40 lakh/ annum to 454 lakh and silk production from 3.3 MT/ annum to 45 MT of reeled tasar yarn and 14MT of spun yarn during the project involving a total of 5824 project beneficiaries. The project shall be implemented in group approach and accordingly, provisions also include support for engaging CRPs and Para Extension Workers (PEW) for implementation of the project components.

During the year, the GoI share of Rs. 51.995 lakh was released to the project under general CSS. New tasar plantations in 305 ha were undertaken and maintained in the project areas. Apart from this, 105 buniyaad reeling machines were supplied to thigh reelers of silk. The activities for strengthening seed production and commercial rearing are being established.

Oak Tasar Development Project in Uttarakhand

A project for "Oak Tasar Development Project in Uttarakhand" was formulated with a total financial outlay of Rs.28.36 Cr for a period of 4 years, from 2016-17 to 2019-20. The project envisages GOI share of Rs.19.55 crore, state share (State Plan and MGNREGS) of Rs 6.83 crore and beneficiary contribution of Rs.1.96 crore. The GoI share of Rs.19.55 crore is proposed to be met from TSP schemes of GoI. The project is proposed to address the infrastructure development for streamlining the seed sector, chawki rearing, equipments/ infrastructure support for conducting seed crop and commercial crops rearing, reeling / spinning and capacity building of various stakeholders, etc. Apart from this, raising of new *Q. serrata* plantations in 500 ha is proposed with a support from MGNREGA in forest / community land to support future development.

The interventions proposed under the project are estimated to increase cocoon production from present level of 1 lakh cocoons / annum to 109 lakh cocoons and silk production from 0.05 MT/ annum to 3.6 MT / annum of reeled tasar yarn and 1.7 MT of spun yarn / annum at the end of the project involving a total of 2,290 project beneficiaries. The project will be implemented by Department of Sericulture, Govt of Uttarakhand in potential districts across low, middle and high altitudes regions of the state to create employment opportunities to poor tribal population inhabiting in these areas. During the year, the GoI share of

Rs.16.095 lakh was released to the project for undertaking awareness and publicity programmes and capacity building of the farmers.

Mysuru Mega Cluster Project

The Govt. of India during the budget announcement for 2014-15, had proposed to set up seven Textile Mega Clusters in the country with an allocation of Rs.200 crore, with one such cluster for silk at Mysuru (Karnataka). Accordingly, it was proposed to set up a Mega Silk Cluster at Mysuru following the guidelines of Comprehensive Powerloom Cluster Development Scheme of Govt. of India. The main objective of the project is to create infrastructure and common facility required for carrying out silk weaving and processing activities.

The Ministry of Textiles, Govt. of India had appointed the Karnataka State Textile Infrastructure Development Corporation Ltd., Bengaluru as Cluster Management and Technical Agency (CMTA) for the project. Ten acres of land identified for the purpose near Mysuru was handed over to the Department of Handlooms and Textiles, Govt. of Karnataka. The SPV has been registered during March 2017. A detailed Project Report preparation is under progress.

4

FINANCE AND ACCOUNTS

I. Receipts (Grant-in-Aid) and Expenditure booked for the financial year 2016-17 and the outlay (BE) approved by the Ministry for 2017-18 are as under:

In accordance with the Section 9(1) of CSB Act, 1948, the Central Government released Grant-in-Aid to CSB during the year 2016-17 for enabling it to exercise the powers and discharge its functions under the Act. The details of the Grant-in-Aid released by the Government of India, Ministry of Textiles, New Delhi and the expenditure booked by CSB during the financial year 2016-17 and also the provisions approved by the Ministry in BE 2017-18 are given in Table 4.1.

Table 4.1: Details of Grant-in-Aid released by Government of India and expenditure booked by CSB during 2016-17

(Unit: Rs. in Lakh)

Sl. No.	Budget heads	GIA Released by MoT during 2016-17	Expenditure booked during 2016-17	Outlay (BE) Approved by MoT for 2017-18
I.	**NON-PLAN**			
1	Grants towards Administrative Expenses – GIA - Salaries	34,250.00	34,250.00	–--
	TOTAL - NON-PLAN	34,250.00	34,250.00	–--
II.	**PLAN**			
	Central Sector Schemes			
II.A	**Grants towards Development of Silk Industry**			
i.	Grants-in-Aid - Salaries (36)	–--	–--	37,200.00
ii.	Grants-in-Aid - General (Revenue) (31)	5,378.00	5,378.00	6,000.00
iii.	Grants-in-Aid - Creation of Capital Assets (35)	4,595.00	4,595.00	5,500.00
	Sub-total	**9,973.00**	9,973.00	48,700.00
II.B	**Grants towards Development of Silk Industry: Special Component Sub-Plan for Scheduled Caste (SPSC)**			
i.	Grants-in-Aid - General (Revenue) (31)	444.20	444.20	1,150.00
ii.	Grants-in-Aid - Creation of Capital Assets (35)	1829.10	1829.10	1,150.00
	Sub-total	2,273.30	2,273.30	2,300.00
II.C	**Grants towards Development of Silk Industry: Tribal Area Sub Plan (TSP)**			
i.	Grants-in-Aid - General (Revenue) (31)	750.00	750.00	1,500.00
ii.	Grants-in-Aid - Creation of Capital Assets (35)	100.00	100.00	1,500.00
	Sub-total	850.00	850.00	3,000.00
	TOTAL - PLAN	**13,096.30**	**13,096.30**	**54,000.00**
III.	**Grants towards Development of Silk Industry in North-eastern Areas (NEA)**			

Sl. No.	State	GIA Released by MoT during 2016-17	Expenditure booked during 2016-17	Outlay (BE) Approved by MoT for 2017-18
i.	Grants-in-Aid - Salaries (36)	----	----	900.00
ii.	Grants-in-Aid - General (Revenue) (31)	1305.00	1305.00	600.00
iii.	Grants-in-Aid-Creation of Capital Assets (35)	1000.00	1000.00	1,000.00
	Sub-total	**2,305.00**	**2,305.00**	**2,500.00**
	TOTAL - NE - PLAN	**2,305.00**	**2,305.00**	**2,500.00**
	GRAND TOTAL (I+II+III)	**49,651.30**	**49,651.30**	**56,500.00**

Loan for the Year 2016-17

No Loan amount was released by the Ministry of Textiles to CSB towards House Building Advance during 2016-17.

Internal Audit

Board Secretariat having its Internal Audit wings with 5 Zonal Audit Teams (ZAT) is conducting internal audit of all the units of CSB on regular basis every year. The Internal Audit Teams have conducted the internal audit during 2016-17 and achieved the target as on 31.03.2017 as per the approved programme (Table 4.2).

In addition, the Internal Audit Section had also given its opinion in respect of 36 cases referred by various sections of CSB on different service matters and other subjects during the year.

Table 4.2: Details of internal audit conducted during 2016-17

Sl. No.	States	Units Covered		Total
		Delegated	Non-Delegated	
1	C O - I A Team	41	10	51
2	ZAT - A, CTR&TI, Ranchi	26	06	32
3	ZAT - B, CSR&TI, Berhampore	16	15	31
4	ZAT - C, CSR&TI, Mysuru	17	15	32
5	ZAT - D, RSRS, Jammu	13	17	30
6	ZAT - E, MSSO, Guwahati	05	16	21
	Total	**118**	**79**	**197**

11 AG audit reports pertaining to various units of CSB have been received and suitable replies were furnished to the respective Accountant Generals/PDC, MAB during 2016-17.

5

SERICULTURE STATISTICS

Raw Silk Production

India has the unique distinction of being the only country producing all the five known commercial silks, namely, mulberry, tropical tasar, oak tasar, eri & muga, of which muga with its golden yellow glitter is unique and prerogative of India.

The import-substitute bivoltine silk has showed a tremendous increase of 14.2% during the current year over the previous year due to the joint efforts of CSB and State Sericulture Departments and keen involvement of farmers in growing bivoltine. Tasar, eri and muga silks achieved a record production of 3268 MT, 5637 MT and 170 MT, respectively during 2016-17.

Table 5.1: Raw Silk Production in India

Sl. No.	Particulars	2016-17 (Target)	2016-17	2015-16	Increase over 2015-16 (%)
A.	**Mulberry Plantation (ha.)**	227000	216810	208947	3.8
B.	**Mulberry Raw Silk (MT)**				
1.	Bivoltine	5260	5266	4613	14.2
2.	Cross Breed	17400	16007	15865	0.9
	Sub-Total (B)	22660	21273	20478	3.9
C.	**Vanya Silk (MT)**				
1.	Tasar	3285	3268	2819	15.9
2.	Eri spun silk	5835	5637	5060	11.4
3.	Muga	220	170	166	2.5
	Sub-Total (C)	**9340**	**9075**	**8045**	**12.8**
	Total (B+C)	**32000**	**30348**	**28523**	**6.4**

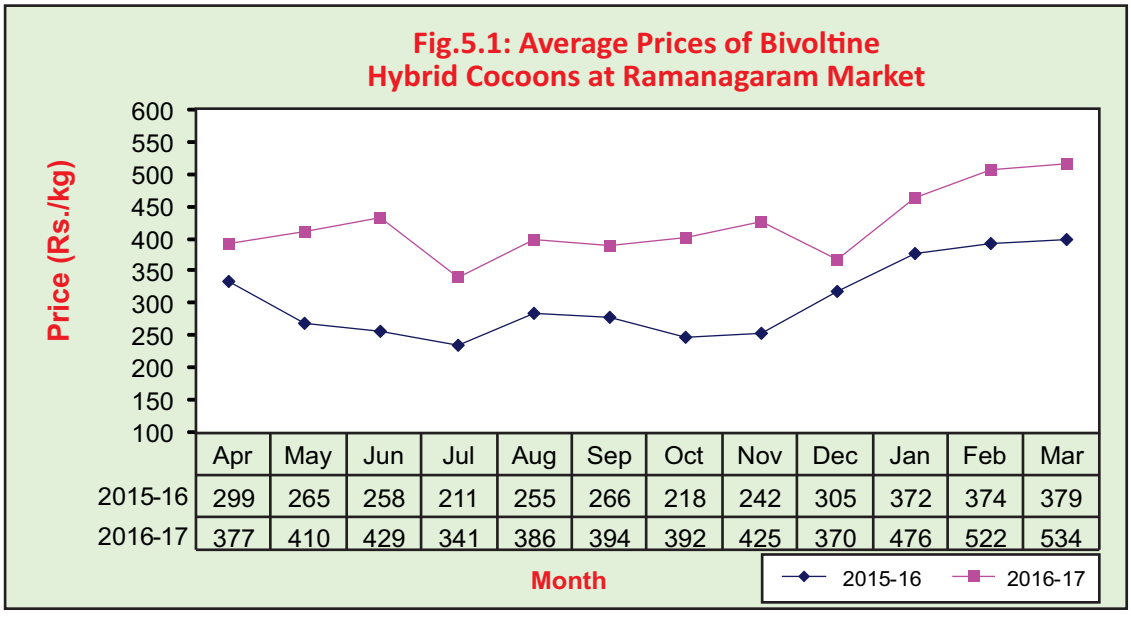
During 2016-17, the total raw silk production in the country has reached to 30,348 MT as compared to 28,523 MT during 2015-16 indicating an increase of 6.4% (Table 5.1). The mulberry raw silk production in the country was 21,273 MT (BV - 5,266 MT and CB - 16,007 MT) in 2016-17 as compared to 20,478 MT (BV - 4,613 MT and CB - 15,865 MT) in 2015-16. Tasar, eri and muga raw silk production recorded an increase of 15.9%, 11.4% and 2.5% respectively, during the current year as compared to last year.

State-wise and variety-wise raw silk production during 2016-17 as compared to 2015-16 is given in the Annexure -IV (A) & (B).

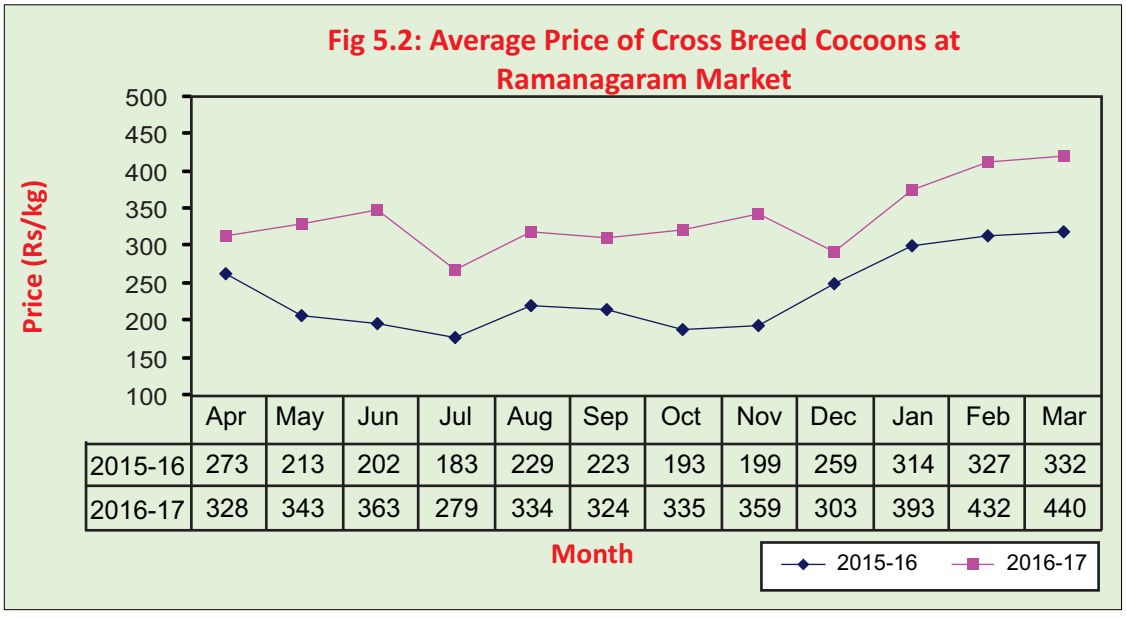
Cocoon and Raw Silk Prices

Mulberry Cocoon Prices:

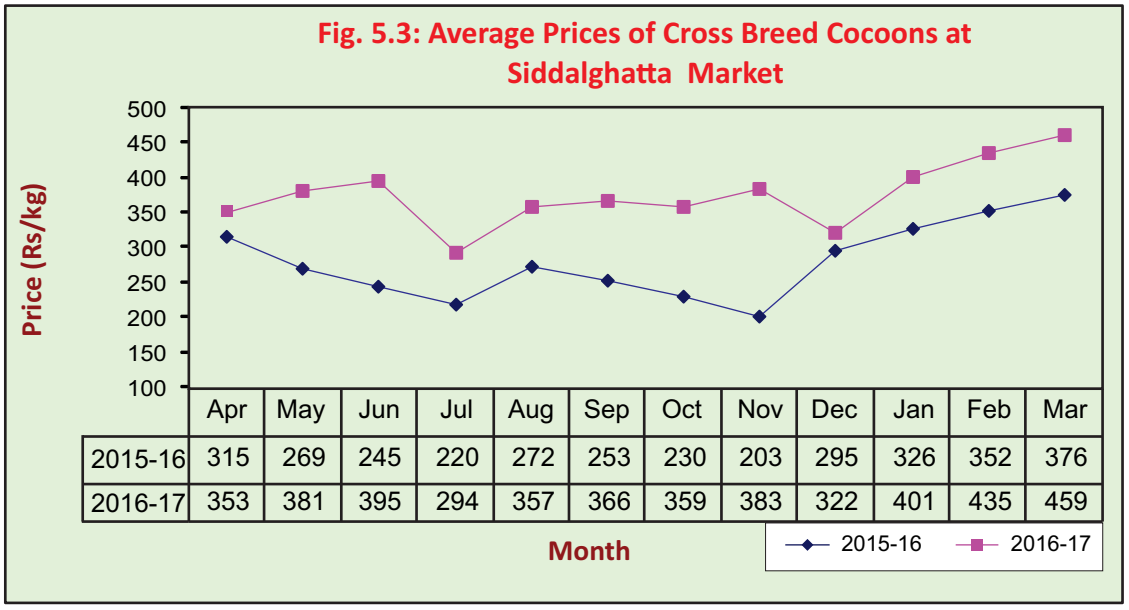
The average prices of bivoltine hybrid reeling cocoons at Government Cocoon Market (GCM), Ramanagaram and cross breed reeling cocoons at GCM, Ramanagaram and Siddlaghatta during 2015 - 16 and 2016 - 17 are depicted in Figs. 5.1 to 5.3.



Data Source: Department of Sericulture, Karnataka



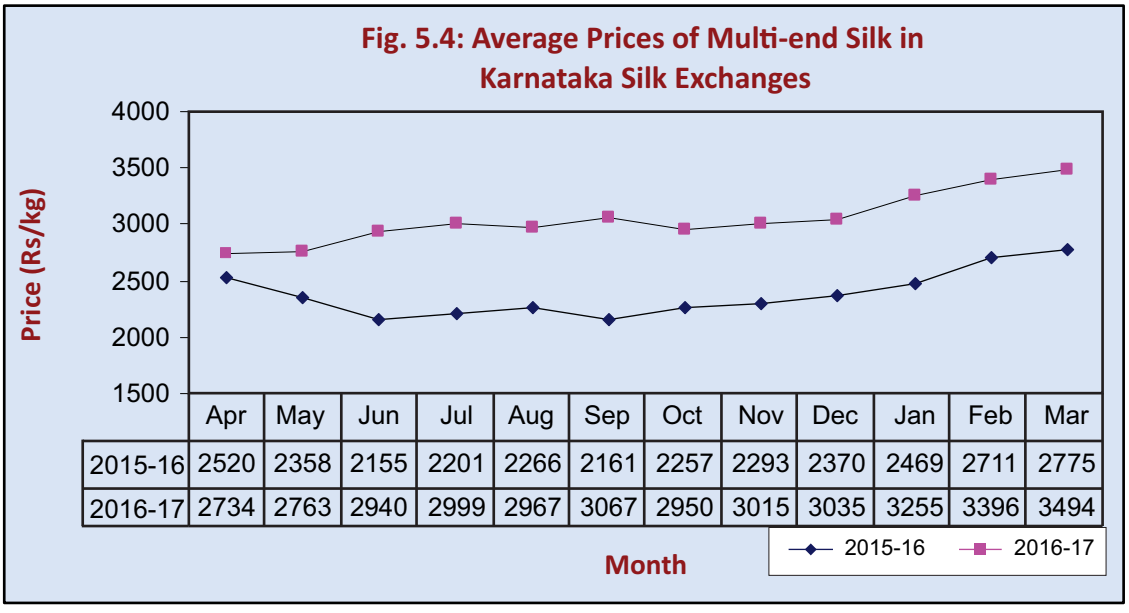
Data Source: Department of Sericulture, Karnataka



	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
2015-16	315	269	245	220	272	253	230	203	295	326	352	376
2016-17	353	381	395	294	357	366	359	383	322	401	435	459

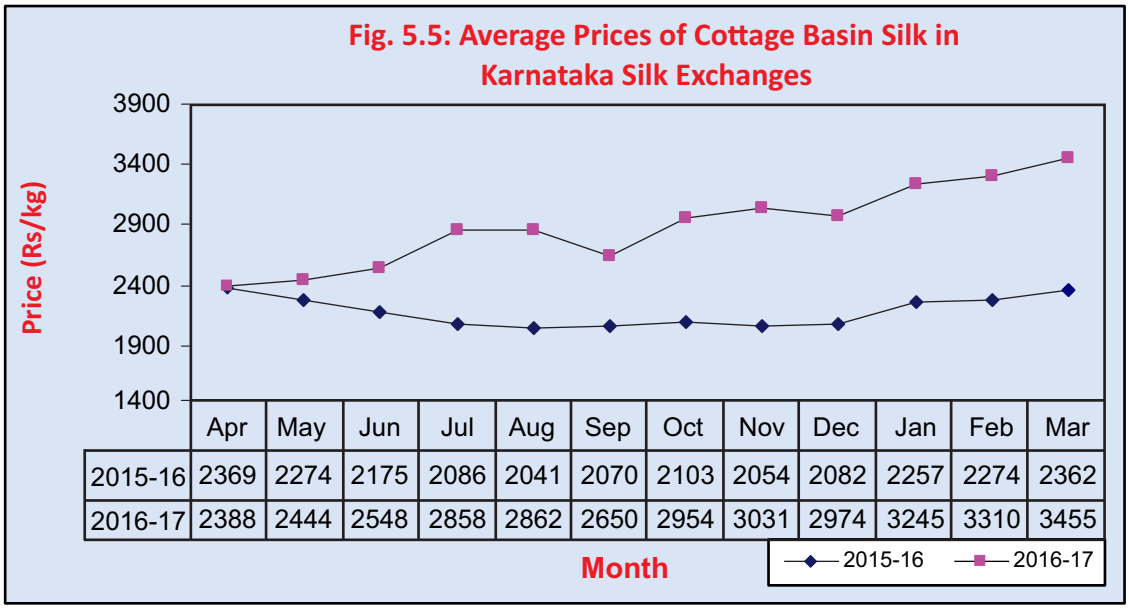
Data Source: Department of Sericulture, Karnataka

Mulberry Raw Silk Prices: The prices of multi-end, Cottage Basin and Dupion silk transacted in silk exchanges of Karnataka are also shown in Figs. 5.4 to 5.6.



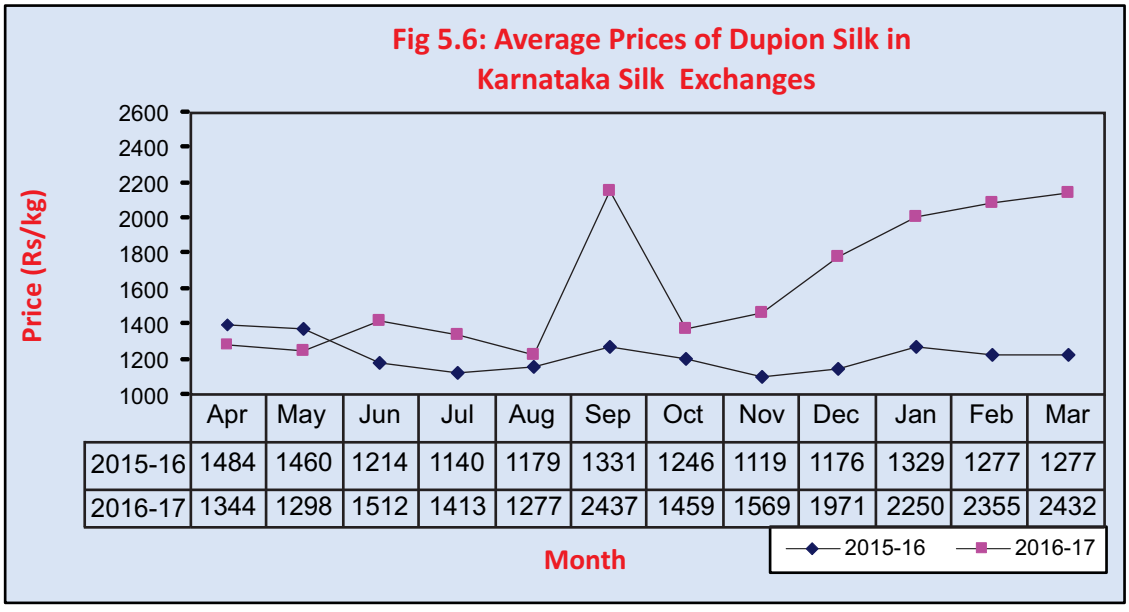
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
2015-16	2520	2358	2155	2201	2266	2161	2257	2293	2370	2469	2711	2775
2016-17	2734	2763	2940	2999	2967	3067	2950	3015	3035	3255	3396	3494

Data Source: Department of Sericulture, Karnataka



	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
2015-16	2369	2274	2175	2086	2041	2070	2103	2054	2082	2257	2274	2362
2016-17	2388	2444	2548	2858	2862	2650	2954	3031	2974	3245	3310	3455

Data Source: Department of Sericulture, Karnataka



	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
2015-16	1484	1460	1214	1140	1179	1331	1246	1119	1176	1329	1277	1277
2016-17	1344	1298	1512	1413	1277	2437	1459	1569	1971	2250	2355	2432

Data Source: Department of Sericulture, Karnataka

Vanya Cocoon and Silk Prices: Prices of cocoon and silk of tasar, eri & muga in important markets of Vanya silk producing states for the years 2015-16 and 2016-17 are given in Table 5.2.

Table 5.2: Prices of Vanya Cocoons and Raw Silk

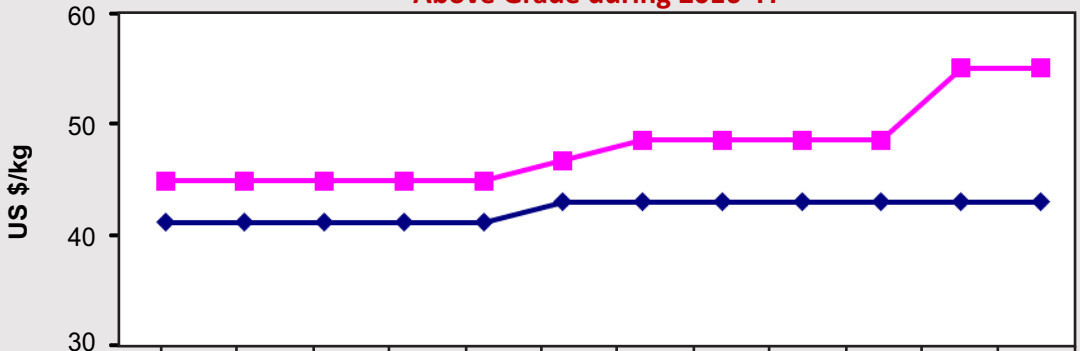
Variety	2015-16	2016-17
A.Tasar Prices *		
1. Reeling Cocoon Rs./(1000 No.)(Grade 1)		
a) Raily	4500-6300	3500-6300
b) Daba	3000-4500	3000-3300
2. Reeled Yarn (Rs./Kg)	3500-4800	3200-4800
3. Ghicha Yarn (Rs./Kg)	1200-2900	1300-2500
B. Eri Prices** (Rs./Kg)		
1. Cut Cocoons (Superior Quality)	600-800	550-850
2. Spun Yarn	1600-3300	1800-2600
C. Muga Prices **		
1. Reeling Cocoon Rs. / (1000 No.)	1300-2150	1600-3500
2. Raw Silk (Rs./Kg)		
a. Warp Yarn	12500-15500	14200-18000
b. Weft Yarn	11000-14000	12500-15500

Note: * Tasar prices pertain to Chaibasa (Jharkhand), Champa & Raigarh (Chhattisgarh) and Bhagalpur (Bihar) markets, ** Eri & muga prices pertain to Guwahati (Assam) market

Source: Raw Material Bank, CSB, Chaibasa and Regional Office, CSB, Guwahati.

Prices of imported Chinese mulberry raw silk: Price range of imported Chinese mulberry raw silk of 3A and above grades along with its sale price at Varanasi market during 2016-17 is depicted in Figs.5.7 to 5.8.

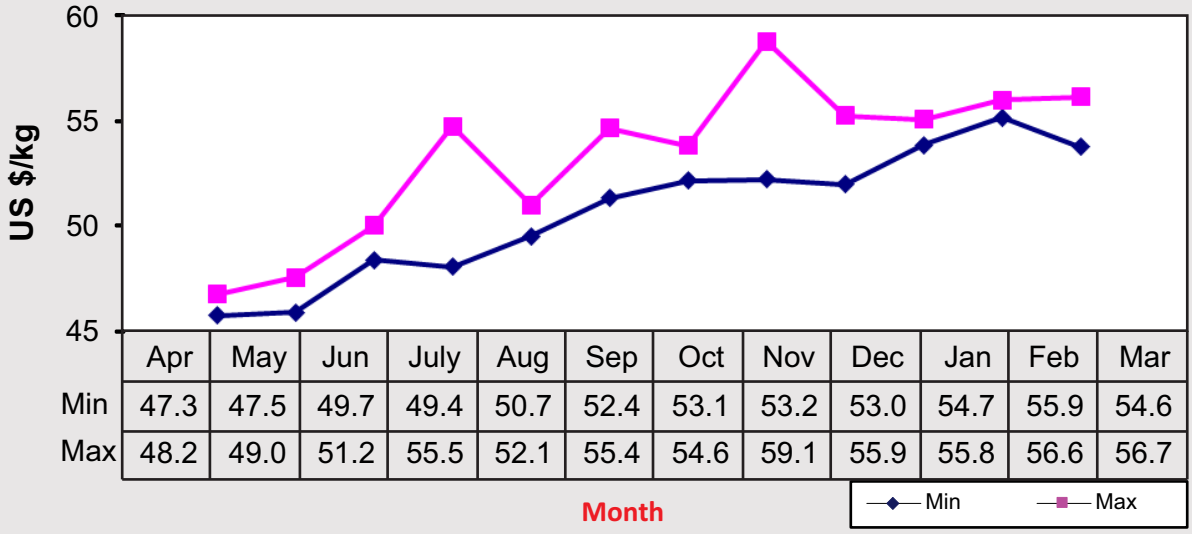
Fig.5.7: Prices of Imported Chinese Mulberry Raw Silk of 3A & Above Grade during 2016-17



	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Min	42	42	42	42	42	44	44	44	44	44	44	44
Max	46	46	46	46	46	48	50	50	50	50	57	57

Data Source: Regional Office, CSB, Mumbai (Collected through M/s Shah Trading Co., Mumbai)

Fig.5.8: Sale Prices of Imported Chinese Silks of 3A & Above Grade during 2016-17 in Varanasi Market



	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Min	47.3	47.5	49.7	49.4	50.7	52.4	53.1	53.2	53.0	54.7	55.9	54.6
Max	48.2	49.0	51.2	55.5	52.1	55.4	54.6	59.1	55.9	55.8	56.6	56.7

Sale prices include custom and Excise duties

Source : Certification Center, CSB, Varanasi

Export of silk goods

Fabrics, made-ups and readymade garments are the major items of India's silk exports, which account for about 91.52% of the total silk goods exports of the country. The export earnings from silk goods during 2016-17 was Rs.2093.42 Crore (US$ 312.12 million) compared to Rs.2495.98 Crore (US$ 381.24 million) in 2015-16. Variety-wise export earnings from silk and silk goods during 2016-17 and 2015-16 is given in Table 5.3.

Table 5.3: Export Earnings from Silk Goods during 2015-16 and 2016-17

Items of export	2015-16		2016-17		% change	
	Crore Rs.	Mn.US$	Crore Rs.	Mn.US$	Crore Rs.	Mn.US$
Cocoons	2.47	0.38	0.32	0.05	-87.04	-87.35
Raw Silk	1.43	0.22	0.44	0.07	-69.23	-69.96
Natural Silk Yarn	26.41	4.03	14.57	2.17	-44.83	-46.15
Fabrics, Made-ups	1280.60	195.60	1051.65	156.80	-17.88	-19.84
Readymade Garments	1078.39	164.71	864.33	128.87	-19.85	-21.76
Silk Carpets	16.88	2.58	63.78	9.51	277.86	268.85
Silk waste	89.80	13.72	98.33	14.66	9.49	6.88
Total	**2495.98**	**381.24**	**2093.42**	**312.12**	**-16.13**	**-18.13**

Source: DGCIS, Kolkata and Ministry of Commerce & Industries website.

The UAE, the USA, the UK and Germany are the major importers of Indian silk goods. Netherland, which did not figure among top ten countries during 2015-16 has emerged as a major exporting destination for Indian silk goods during 2016-17. The export earnings from top ten importing countries put together accounted for 68.96% of total exports. Country-wise export earnings from silk goods during 2016-17 and 2015-16 are given in Table 5.4.

Table 5.4: Country-Wise Export Earnings from Silk Goods during 2015-16 and 2016-17

Sl. No.	Country	2015-16		2016-17		% change	
		Crore Rs.	Mn.US$	Crore Rs.	Mn.US$	Crore Rs.	Mn.US$
1	U.A.E.	606.76	92.68	546.31	81.45	-9.96	-12.11
2	U.S.A.	340.37	51.99	263.85	39.34	-22.48	-24.33
3	U.K.	155.84	23.80	128.39	19.14	-17.61	-19.58
4	Germany	73.03	11.15	107.78	16.07	47.58	44.06
5	China	89.48	13.67	89.17	13.30	-0.35	-2.72
6	France	90.43	13.81	78.61	11.72	-13.07	-15.14
7	Italy	79.58	12.16	73.72	10.99	-7.36	-9.57
8	Netherlands	36.13	5.52	55.99	8.35	54.97	51.27
9	Tanzania	96.91	14.80	53.13	7.92	-45.18	-46.48
10	Sudan	74.82	11.43	46.63	6.95	-37.68	-39.16
Other Countries		852.64	130.23	649.84	96.89	-23.78	-25.60
Total		**2495.98**	**381.24**	**2093.42**	**312.12**	**-16.13**	**-18.13**

Source: DGCIS, Kolkata and Ministry of Commerce & Industries websites.

Import of silk goods

Raw silk, silk yarn, fabrics and made-ups are the major items of imports, which account for about 98.09% of the total imports. During 2016-17, the value of silk goods import was Rs. 1438.17 crore (US $ 214.43 million) compared to Rs.1389.10 crore (US$ 212.17 million) in 2015-16, indicating an increase of 3.53% in Rupee terms and an increase of 1.06% in US$ terms. The import value of raw silk and silk goods during 2016-17 and 2015-16 are given in Table 5.5.

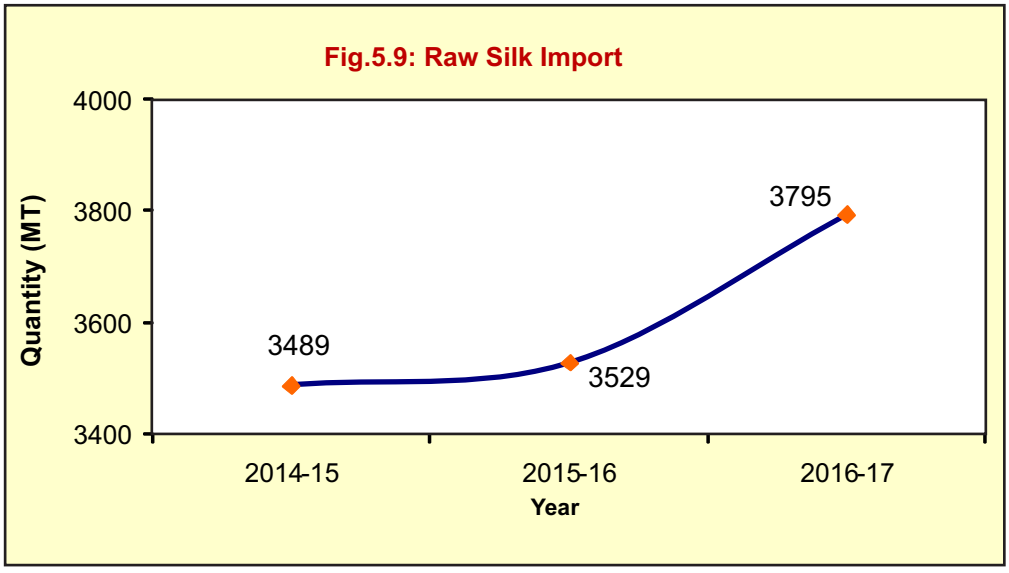
Table 5.5: Value of Import of Silk Goods during 2015-16 and 2016-17

Item	2015-16		2016-17		% change	
	Crore Rs.	Mn.US$	Crore Rs.	Mn.US$	Crore Rs.	Mn.US$
Raw Silk	1006.16	153.68	1092.26	162.85	8.56	5.97
Silk Yarn	81.66	12.47	76.66	11.43	-6.12	-8.36
Fabrics, Made-ups	249.46	38.10	241.74	36.04	-3.09	-5.41
Readymade Garments	15.00	2.29	12.37	1.84	-17.53	-19.50
Silk Carpets	0.05	0.01	0.11	0.02	120.00	114.75
Silk waste	36.77	5.62	15.03	2.24	-59.12	-60.10
Total	**1389.10**	**212.17**	**1438.17**	**214.43**	**3.53**	**1.06**

Source: DGCIS, Kolkata and Ministry of Commerce & Industries websites.

The quantity of raw silk import increased from 3,529 MT in 2015-16 to 3,795 MT in 2016-17 and registered an increase of 7.5 (Fig 5.9).

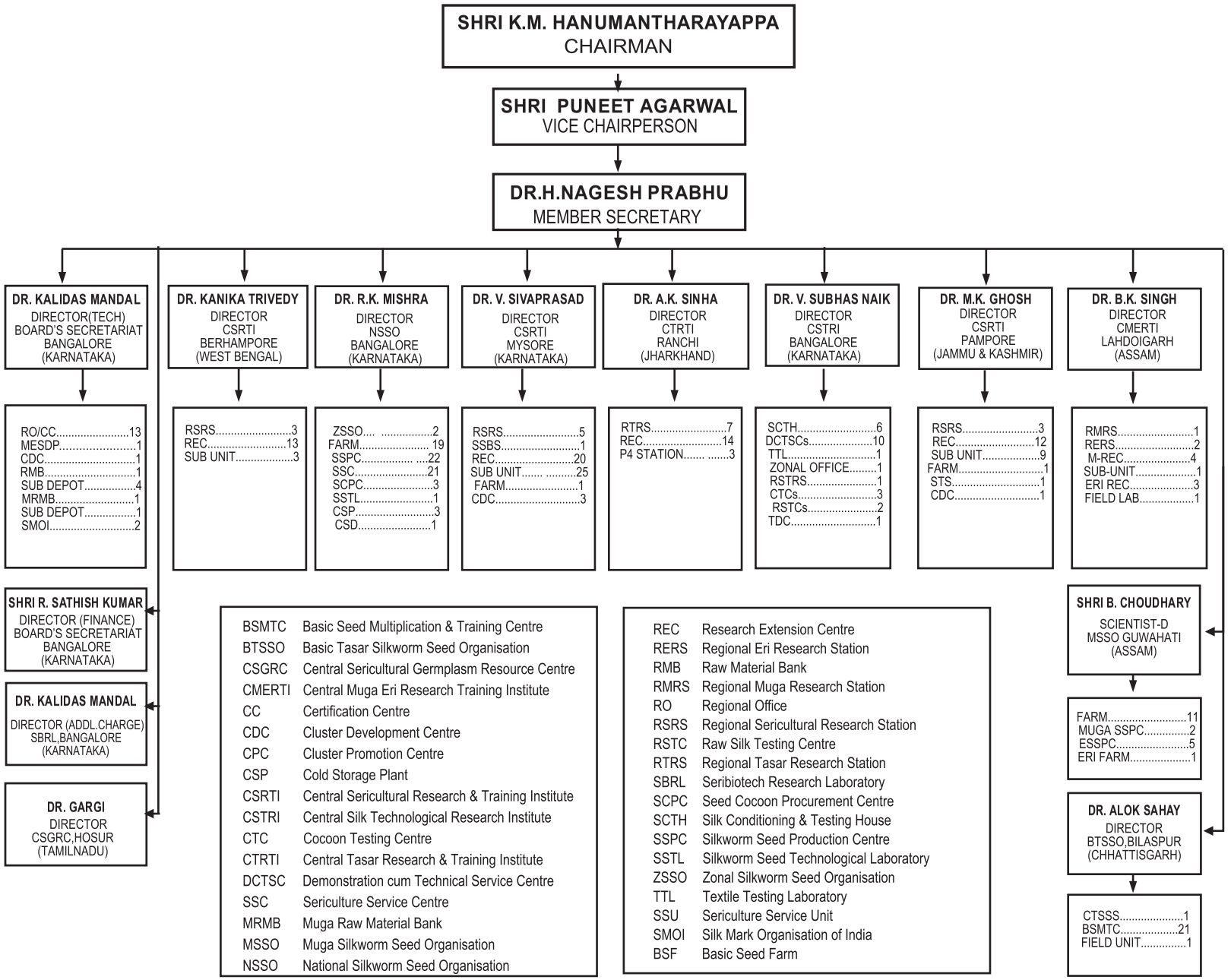
Fig.5.9: Raw Silk Import



Data Source: DGCIS, Kolkata

Annexure-I(A)

ORGANISATION CHART OF CENTRAL SILK BOARD



INSTITUTE-WISE UNITS OF CENTRAL SILK BOARD, BANGALORE AS ON 31.03.2017

Annexure I(B)

CSR &TI MYSORE (56)

RSRS Bangalore
RSRS Salem
RSRS Ananthpur
RSRS,Chamrajnagar
RSRS,Shadnagar
SSBS,Coonoor
REC Madivala
REC Bidaraguppe
REC Chitradurga
REC Rayachoty
REC Vikarabad
REC Krishnagiri
REC Samayanallur
REC Parbhani
REC Baramati
REC Madakisra
REC Venkatagirikota
REC Udumalpet
REC Eluru
REC G.palayam
REC,Amaravathi
REC Hoshangabad
REC Palakkad
REC, Kalyanidurgam
REC Palamner
REC,Srivilliputhur
S-unit,Aurangabad
S-unit,Kanakapura
S-unit Bidar
S-unit Koppal
S-unit Kinkanahally
S-unit,Penukonda
S-unit, Maddur
S-unit,Osamanabad
S-unit,Jalna
S-unit,Burhanpur
S-unit,Markapur
S-unit,Suryapet
S-unit,Chebrolu
S-unit,Atmakur
S-unit,Metpally
S-unit,Tumkur
S-unit,Ranebennur
S-unit,Berigai
S-unit,Shahapur
S-unit,Shirahatti
S-unit,Bijapur
S-unit,Jamkhandi
S-unit,Avinashi
S-unit,Trichy
S-unit,Kudlagi
CDC,Palamner
CDC,Hosakote
CDC,Agali
P4 Hassan

RSRSs	5
SSBS,Coonoor	1
RECs	20
CDC	3
S-Unit	25
Farm	1
Total	**55**

CSR & TI PAMPORE (27)

RSRS Sahaspur
RSRS Jammu
RSRS,Ghumarwin
REC Naduan (HP)
REC Sujanpur (PUNJ)
REC Barnoti (J & k)
REC Gonda (U.P.)
REC,Fatehnagar
REC, Nowshera (J&K)
REC, Gorakhpur(UP)
REC, Chutmalur(UP)
REC, Bageswar (UTR)
REC, Una (HP)
REC,Udhamsinghnagar
S-unit Tikri(J&K)
S-unit Tral (J&K)
S-unit Bandipora(J&K)
S-Unit,Panchkula(Har)
S-unit,Bhadrasi(UP)
S-unit, Kotdwar
S-unit,Pathri
S-unit,Pilibhit
S-unit,Bahraich
CDC,Kalsi
STS,Fatehnagar
P4 Manasbal (BV)

RSRSs	3
RECs	11
CDC	1
S-Unit	9
STS	1
Farm	1
Farm	1

CSR & TI BERHAMPORE (19)

RSRS Kalimpong (W.B)
REC, Mongoldai(Assam)
REC, Dhenkikote
REC Rangpoo (SIKKIM)
REC Kamnagar (W.B)
REC Mahespurraj(JHA)
REC, Bhandra(JHA)
REC Bademarenga(CHA)
REC Bagamara (W.B)
S-Unit, Deogarh (ORI)
S-Unit, Kolitha(SB)
RSRS, Jorhat(Assam)
REC.Agartala(Tripura)
REC, Shillong(Meghalaya)
REC, Dimapur(Nagaland)
REC, Aizwal(Mizoram)
REC, Imphal (Manipur)

RSRSs	3
RECs	13
S-Unit	2
Total	**18**

CTR & TI RANCHI (24)

RTRS Jagadalpur (CHHA)
RTRS Baripada (ORISSA)
RTRS Warrangal (A.P)
RTRS Bhandara (MAH)
RTRS Bhimtal (UTR)
RTRS Imphal (MANIPUR)
RTRS,Dumka (JHA)
REC Palampur (H.P)
REC Hatgamaria (JHA)
REC Katghora (CHHA)
REC Bangriposi (ORISSA)
REC Robertsganj (U.P)
REC,Bhadrachalam (AP)
REC,Kapista (W.B)
REC,Gopeshwar (UTR)
REC Umrangsu (ASSAM)
REC Kikruma (NAGALAND)
REC Yaikongpao(MANIPUR)
REC Purulia (W.B)
REC,Jhansi (UP)
P4 Station,Katghora(CHHA)
P4 Station, Chakradharpur(JHA)
P4 Station,Dumka (JHA)

RTRSs	7
P4 Station	3
RECs	13
Total	23

BTSSO, BILASPUR(CHHA) (24)

CTSSS,Kargi Kota(CHHA)
BSMTC Chinnoor (A.P)
BSMTC Narasapur (A.P)
BSMTC Rampachodavaram(AP)
BSMTC Kharswan (JHA)
BSMTC Kathikund (JHA)
BSMTC Madhupur (JHA)
BSMTC Deoghar (JHA)
BSMTC Ambikapur (CHHA)
BSMTC Pali (CHHA)
BSMTC Bastar (CHHA)
BSMTC Balaghat (M.P)
BSMTC Boirdadar (CHHA)
BSMTC Bhandara (MAH)
BSMTC Nowrangpur (ORISSA)
BSMTC Sundargarh (ORISSA)
BSMTC Patelnagar (W.B)
BSMTC Dudhi (U.P)
BSMTC Bhagalpur (Bihar)
BSM&TC Bilaspur (CHHA)
BSM&TC Baripada (ORI)
BSM&TC Kendujhar(ORI)
Field Unit,PallaharA (ORI)

BSM&TCs	21
Field Uni	1
CTSSS	1
Total	**23**

NSSO, BANGALORE(73)

KARNATAKA	TAMIL NADU	WEST BENGAL
SCPC Kunigal	P2 Krishnagiri (MV)	ZSSO,MALDA
SCPC,K.R.Pet	P2 Y. Hills (BV)	
	SSPC Dharmapuri	P3 A.falkatta
P3 Mysore	SSPC,Hosur	P2 Karnasubarna
P3 Nagamangala	SSPC Tirupattur	P2 Banguria
P2 Dharmapura (BV)	SCPC,Denkanikottai	P2 Dhubulia
P2 Gavimata (BV)		
P2 Nagenahalli(MV)	CSP,Hosur	SSPC Berhampore
		SSPC D.B Pur
SSPC Bangalore	**ANDHRA PRADESH**	SSPC Kolitha
SSPC Mysore		SSPC Raiganj
SSPC Ramanagaram	P2 Horsely Hills	
SSPC Vijayapura	P2 Madakasira (BV)	SSC Hemtabad
SSPC Chintaman	P2 Parigi (MV)	SSC Bhadrapur
iSSPC K.R.Nagar	SSPC Hindupur	SSC Gadadharpur
SSPC Malavalli	SSPC Madanapalle	SSC Alinagar
	SSPC Chittoor	SSC Amrity
Grainage/P1,	SSC Vijayawada	SSC Sujapur
Chikkamalavadi		SSC Mothabari
	KERALA	SSC Panchagram
SSC K.R.Pet	SSPC Palakkad	SSC Kaliachak
SSC C.R.Patna	P2 Palakkad	SSC,Kaliaganj
SSC Pandavapura		SSC, Aiho
SSC K.P.Doddi	**BIHAR**	SSC, Bishnupur
SSC Gowribidanur	P2 Purnea	**UTTARANCHAL**
SSC Belgaum		ZSSO, Dehradun
SSC Haveri	**ORISSA**	P3 Majra
SSC Attibele	CSD, Ramgiri	P2 Sheeshambara
		SSPC Dehradun
	JAMMU & KASHMIR	CSP,Dehradun
SSTL Kodathi	SSPC Udhampur	SSTL = 1
BSF,Yediyur		ZSSOs = 2
		BSFs = 19
CSP,Mysore		SSPCs = 22
		SSCs = 21
		SCPCs = 3
		CSP = 3
		CSD = 1
		Total =72
RO's (10)	RO,Hyderabad	**CERTIFICATION**
RO,New Delhi	RO,ChennaiS	**CENTRES (3)**
RO,Jammu	MOI,Coimbatore	CC,Varanasi
RO,Jammu	RO,Bhubaneswar	CC,Bangalore
RO,Kolkata	RO,Guwahati	CC,Srinagar
RO,PatnaME	RO,Lucknow	
SDP,Kishanganj		
CDC,Saharsa	MRMB,Sivasagar	**CSGRC, Hosur**
	MRMB SD,Sulakuchi	**SBRL,BANGALORE**

CSTRI BANGALORE (25)

Text. Testing Lab,Varanasi
SC&TH Dharmavaram
SC&TH Kancheepuram
SC&TH/ECO Lab Jammu
SC&TH Srinagar
SC&TH Malda
Zonal Office,Bilaspur
CTC,Coimbatore
CTC,Ramanagaram
CTC,Dharmapuri
RSTRS,Guwahati
RSTC,Sidlaghatta
RSTC,Kollegal

DCTSC,Rayapura(Kar)
DCTSC,Hindupur(AP)
DCTSC,Dharmapuri(TN)
DCTSC,Bhandara(Mah)
DCTSC,Cuttack(Ori)
DCTSC,Dehradun(U'khand)
DCTSC,Jammu(J&K)
DCTSC, Bhagalpur(Bihar)
DCTSC,Suri(WB)
DCTSC,Nurupur(HP)

RSTRS,Guwahati	1
TTL	1
SC&THs	6
DCTSCs	10
Zonal Office,Bilaspur	1
RSTCs	2
CTCs	3
Total	**24**

CO,Bangalore
SMOI, Palakkad

RMB,Chaibasa (Jha)
RMB SD,Bhagalpur(Bihar)
RMB SD,Raigarh (Chha)
RMB SD,Warangal
RMB SD,Bhandara

MSSO, GUWAHATI (19)

P4 Nongpah (MEGH)
P3 Rompara (MEGH)
P3 Adokgiri (MEGH)
P3 Hahim (ASSAM)
P3 Mendipathar (MEGH)
P3, Naryanapur
P3, Kalimpong
P3, Kovabill
P3,Paliapool
P3,Kobulong
P4, Tura
MUGA-SSPC Kaliabari
MUGA-SSPC Tura

Eri BSF,Topatali
Eri SSPC, Azara
ERISSPC , Peddapuram

ERISSPC,Hosur
Eri SSPC,Haldwani

Farms	11
M-SSPC	2
E-SSPC	4
E-BSF	1
Total	**18**

CMER&TI LADOIGARH (12)

RERS,Mendipathar(MEG)
RMRS Boko (ASSAM)

MUGA-REC, Lakhimpur
MUGA-REC, Coochbehar
MUGA-REC, Tura
MUGA-REC,Balijan
MUGA-REC Sub-unit, Kokrajhar
MUGA Field Lab,Titabar

ERI REC Diphu (ASSAM)
ERI REC,Fatehpur (UP)
ERI REC,Navasari

RMRS	1
RERS	1
M-REC	4
E-REC	3
REC Sub-unit	1
Field lab	1
Total	**11**

ABSTRACT

CSB - HQ	1	ERI-BSF	-> 1
CSR&TI	3	MRMB (Muga)	-> 1
CTR&TI	1	MRMB-SD	-> 1
CSTRI	1	SC&TH->6	-> 6
NSSO	1	Zonal Off.Bilaspur	-> 1
MSSO	1	DCTSCs	->10
CMERTI	1	CTCs/TDC	-> 3
RERS	1	RSTCs->2	-> 2
CSGRC	1	BTSSO,Bilaspur	-> 1
SBRL,B,lore	1	CTSSS Kargi Kota	-> 1
SSTL	1	BSM&TC (Tasar)	->21
ROs/CCs	13	Field Unit,Pallahara	-> 1
SMOI	2	ZSSO (Mulb)	-> 2
MESDP,Kishanganj	1	SCPC (Mulb)	-> 3
TTL,Varanasi	1	BSFs (Mulb)	->21
RSTRS,Guwahati	1	BSFs (MSDP)	->11
RSRS (Mulb)	11	SSPC (Mulb)	->22
SSBS, Coonoor	1	SSPC (Muga)	-> 2
RMRS (Muga)	1	SSCs (Mulb)	->21
RTRS (Tasar)	7	STS/CSP/CSD	-> 5
REC (Mulb)	44	ERISSPC	-> 4
REC (Tasar)	13	CDCs/CPC	-> 5
REC (Muga)	4	P4 Stations	-> 3
REC (Eri)	3	Field Lab,Titabar	-> 1
S-unit (Mulb)	36	**Total**	**306**
S-unit,(Muga)	1		
RMB (Tasar)	1		
RMB-SD (Tasar)	4		

BTSSO - Basic Tasar Silkworm Seed Organization
CC - Certification Centre
CSR & TI - Central Sericultural Research & Trg. Institute
CSTRI - Central Silk Technological Research Institute
CTR & TI - Central Tasar Reasearch & Training Instititute
CSGRC - Central Sericultural Germplasm Res. Centre
CTSSS - Central Tasar Silkworm Seed Station
DCTSC - Demonstration cum Technical Service Centre
TTL - Textile Testing Laboratory

SSC - Sericulture Service Centre
MRMB - Muga Raw Material Bank
NSSO - National Silkworm Seed Organisation
P4,P3,P2 - Basic Seed Farms
REC - Research Extention Centre
RMB - Raw Material Bank
RMB-SD - Raw Material Bank (Sub Depot)
ZSSO - Zonal Silkworm Seed Organisation
CSD - Centre for Seiulture Development

RMRS - Regional Muga Research Station
RO - Regional office
RERS - Regional Eri Research Station
RTRS - Regional Tasar Research Station
SC&TH - Silk Conditioning & Testing House
SCPC - Seed Cocoon Procurement Centre
S-UNIT - Sub unit attached to Research Extension Centre
SSPC - Silkworm Seed Production Centre
CTC - Coccon Testing Centre

Annexure II

COMPOSITION OF BOARD MEMBERS AS ON 31.03.2017

Sl. No.	Name & Address of the Member
I	**UNDER SECTION 4(3)(a)**
1	**Shri K.M. Hanumantharayappa** Chairman, Central Silk Board Bengaluru – 560 068, Karnataka (08.08.2016 to 07.08.2019)
II	**UNDER SECTION 4(3)(b)**
2	**Shri Puneet Agarwal, IAS** Joint Secretary (Silk) & Vice-Chairman, CSB Ministry of Textiles, Govt. of India 'Udyog Bhavan', New Delhi - 110 011 (26.02.2016 to 25.02.2019)
3	**Smt. Neelam S. Kumar** Chief Controller of Accounts Ministry of Textiles, Govt. of India 'Udyog Bhavan', New Delhi - 110 011 (10.07.2015 to 09.07.2018)
4	**Dr. H. Nagesh Prabhu, IFS** Member Secretary Central Silk Board, Bengaluru-560 068, Karnataka (20.07.2015 to 15.05.2017)
III	**UNDER SECTION 4(3)(C)**
5	**Shri P.C. Mohan** Member of Parliament (Lok Sabha) 1928, 30th Cross, 12th Main Banashankari 2nd stage, Monotype G.K. Kalyana Mantapam, Bengaluru-560 050, Karnataka (18.07.2014 to 17.07.2017) No.160, South Avenue, New Delhi – 110 011
6	**Shri Ashwini Kumar Choubey** Member of Parliament (Lok Sabha) New Delhi (18.07.2014 to 17.07.2017) T.N. Singh Lane, Manik Sarkar Adampur, Bhagalpur, Bihar
7	**Shri Nimmala Kristappa** Member of Parliament (Lok Sabha) 12-A, Ferozeshah Road, New Delhi (18.07.2014 to 17.07.2017) Gorantla – 515 231, Anantapur District, Andhra Pradesh
8	**Smt. P.K. Sreemathi Teacher** Member of Parliament (Lok Sabha) Kannur Azhikkodan Samaraka Mandiram Kannur – 670 302, Kerala (18.07.2014 to 17.07.2017) Edathil House, Athiyadam, Payangadi (PO) Kannur – 670 303, Kerala
9	**Shri Basawaraja Patil** Member of Parliament (Rajya Sabha) No.C-703, Swarn Jayanti Sadan Dr. B.D. Marg, New Delhi – 110 011 (08.05.2015 to 02.04.2018) No.3/1/28, Vidyanagara Colony Sedam - 585 222, Gulbarga District, Karnataka
10	**Shri Neeraj Shekhar** Member of Parliament (Rajya Sabha) No.3, Gurudwara Rakabganj RoadNew Delhi-110 001 (08.05.2015 to 07.05.2018) Village & Post – Ibrahim Patti, District Balia, Uttar Pradesh – 221 716
IV	**UNDER SECTION 4(3)(d)**
11	**Shri Rajeev Chawla, IAS** Principal Secretary Govt. of Karnataka, Horticulture Department Room No.404, 4th Floor,3rd Gate, M.S. Building Dr. B.R. Ambedkar Veedhi Bengaluru – 560 001, Karnataka (09.10.2014 to 08.10.2017)

Sl. No.	Name & Address of the Member
12	**Shri G.S. Kariyappa, IFS** Commissioner for Sericulture Development & Director of Sericulture, Government of Karnataka 5th Floor, M.S. Building, Dr. B.R. Ambedkar Veedhi Bengaluru – 560 001, Karnataka (09.10.2014 to 08.10.2017)
13	**Shri Mohamud Dastagira** S/o. Shri Abdul Rahim No.3738, Mehaboobnagar Ramanagaram – 562 159, Karnataka (20.08.2014 to 19.08.2017)
14	**Shri K. Mudde Gowda (Ramesh)** S/o. Shri Kempe Gowda, Kempaiana Hundi T. Narasipura Taluq, Mysore District, Karnataka (20.08.2014 to 19.08.2017)
15	**Shri P. Somanna** S/o. Late Puttaswamy Suttur Village, Biligere Hobli, Nanjangud Taluq Mysore District, Karnataka (20.08.2014 to 19.08.2017)
V	**UNDER SECTION 4(3)(e)**
16	**Shri Harmander Singh, IAS** Principal Secretary to Govt. Handlooms, Handicrafts, Textiles & Khadi Department (G2) Govt. of Tamil Nadu, Secretariat, Fort St. George, Chennai-600 009, Tamil Nadu. (20.08.2014 to 19.08.2017)
VI	**UNDER SECTION 4(3)(f)**
17	**Smt. Soma Bhattacharjee, IAS** Commissioner of Textiles, Govt. of West Bengal New Secretariat Building, 6th Floor, Block-A, Kiran Sarkar Ray Road, Kolkata-700 001, West Bengal (3.11. 2014 to 02.11.2017)
18	**Janab Mohammad Sohrab** S/o. Late Yar Mohammad, Village-Mongolian, P.O. Charsale, P.S. Raghunathganj-742 225 Dist. Murshidabad, West Bengal (17.03.2017 to 16.03.2020)

Sl. No.	Name & Address of the Member
VII	**UNDER SECTION 4(3)(g)**
19	**Shri Chiranjiv Choudhary, IFS** Commissioner of Sericulture, Govt. of Andhra Pradesh Department of Sericulture, TTPC Building, 1st Floor, Old Market Yard, Chuttugunta, Nallapadu Road,Guntur-522 004, Andhra Pradesh.(22.12.2014 to 21.12.2017)
20	**Shri Mukta Nath Saikia, ACS** Director of Sericulture, Government of Assam Directorate of Sericulture, Near Research Gate P.O. Khanapara - 781 022, Guwahati, Assam (20.8.2014 to 19.8.2017)
21	**Shri Saket Kumar, IAS** Director, Handloom & Sericulture Department Government of Bihar, Vikas Bhavan Patna - 800 015, Bihar (3.11. 2014 to 2.11. 2017)
22	**Shri Shyam Lal Dhawde** Director, Directorate of Rural Industries (Sericulture Sector) Govt. of Chhattisgarh, 4th Floor, Block-A, Indravathi Bhawan, New Raipur-492002, Chhattisgarh (16.09.2016 to 15.09.2019)
23	**Smt. Vatsala Vasudeva, IAS** Secretary & Commissioner, Cottage & Rural Industries, Govt. of Gujarat, Block No.7 Udyog Bhavan, Gandhinagar - 382 010, Gujarat (3.11.2014 to 2.11. 2017)
24	**Shri Dipankar Panda** Director, Handloom, Seri & Handicrafts Dept. of Industries, Government of Jharkhand Nepal House, Doranda, Ranchi-834002, Jharkhand. (02.06.2016 to 01.06.2019)
25	**Shri Anil Kumar Srivastava, IFS** Commissioner/ Director of Sericulture Govt. of Madhya Pradesh, Lower Basement, Satpura Bhawan, Bhopal-462004, Madhya Pradesh (9.10.2014 to 08.10.2017)

Sl. No.	Name & Address of the Member
26	**Director of Sericulture & Weaving** Directorate of Sericulture Government of Uttar Pradesh L D A Commercial Complex 1st Floor, Vishwas Khand – III, Gomti Nagar, Lucknow - 226 010, Uttar Pradesh (14.10.2015 to 13.10.2018)
27	**Shri Sudhir Mohan Sharma** Director of Sericulture, Directorate of Sericulture Government of Uttarakhand, Premnagar, Dehradun – 248007 Uttarakhand (02.06.2016 to 01.06.2019)
VIII	**UNDER SECTION 4(3)(h)**
28	**The Principal Secretary** Govt. of Jammu & Kashmir Agriculture Production Dept. Room No.205 / 206, 2nd Floor, Civil Secretariat, Srinagar – 190 001 Jammu & Kashmir (22.12.2014 to 21.12.2017)
IX	**UNDER SECTION 4(3)(i)**
29	**Shri Baldev Chauhan** Deputy Director of Industries (Sericulture) Directorate of Industries, Udyog Bhavan Govt. of Himachal Pradesh Shimla - 171001, Himachal Pradesh (02.06.2016 to 01.06.2019)

Sl. No.	Name & Address of the Member
31	**Smt. Chithra Arumugam, IAS** Commissioner-cum-Secretary Handlooms, Textiles and Handicrafts Dept. Government of Odisha, Sathya Nagar Bhubaneswar-751007 Odisha (20.08.2014 to 19.08.2017)
30	**The Director of Sericulture** Manipur Sericulture Project Complex Govt. of Manipur, Imphal East (02.06.2016 to 01.06.2019)
XI	**PERMANENT INVITEES**
1	**Dr. Kavita Gupta, IAS** Textile Commissioner, Ministry of Textiles Govt. of India, New CGO Building No. 48, New Marine Line P.B. No. 11500, Mumbai-400 020 Maharashtra
2	**Shri Satish Gupta** Chairman, Indian Silk Export Promotion Council B-1 Extension, A-39, Mohan Co-operative Industrial Estate, Mathura Road, New Delhi – 110 044
3	**Shri L. Venkatram Reddy** Director of Sericulture (FAC) Govt. of Telangana, Road No. 72, Prashashan Nagar, P.O. Film Nagar Hyderabad – 500 033, Telangana

Implementation of Sericulture Programme with the Convergence support of RKVY, MGNREGA, Tribal Development Fund etc. during 2016-17

[Unit: Rs. in Lakhs]

#	State	RKVY					MNREGA					Others (*)					Total				
		Project Prepared		Project Sanctioned		Fund Released	Project Prepared		Project Sanctioned		Fund Released	Project Prepared		Project Sanctioned		Fund Released	Project Prepared		Project Sanctioned		Fund Released
		No.	Amount	No	Amount		No.	Amount	No	Amount		No	Amount	No	Amount		No.	Amount	No.	Amount	
I	**SOUTHERN ZONE**																				
1	Karnataka	9	2000.00	9	20.00	996.10	1	12789.93	1	15341.88	1600.87	18	26097.00	18	26097.00	11774.39	28	40886.93	28	41458.88	14371.36
2	Andhra Pradesh	9	1659.75	9	1659.75	1426.20	1	10814.56	1	10814.56	951.05	17	8011.00	17	8011.00	7407.59	27	20485.31	27	20485.31	9784.84
3	Telangana	9	301.05	0	0.00	0.00	8	1010.00	2	86.48	86.48	0	0.00	0	0.00	0.00	17	1311.05	2	86.48	86.48
4	Tamil Nadu	0	0.00	0	0.00	0.00	1	4.00	1	4.00	4.00	3	1791.00	1	1791.00	1791.00	4	1795.00	2	1795.00	1795.00
5	Kerala	0	0.00	0	0.00	0.00	1	15.34	1	15.34	8.13	0	0.00	0	0.00	0.00	1	15.34	1	15.34	8.13
6	Maharashtra	4	2435.00	4	2435.00	2100.30	2	7895.38	2	3805.10	401.49	1	913.00	1	625.67	546.24	7	11243.38	7	6865.77	3048.03
	Total for Southern	**31**	**6395.80**	**22**	**4114.75**	**4522.60**	**14**	**32529.21**	**8**	**30067.36**	**3052.02**	**39**	**36812.00**	**37**	**36524.67**	**21519.22**	**84**	**75737.01**	**67**	**70706.78**	**29093.84**
II	**North Western Zone**																				
1	Jammu & Kashmir	4	67.64	4	67.64	33.82	1	389.75	0	0.00	0.00	2	492.51	2	281.55	281.55	7	949.90	6	349.19	315.37
2	Himachal Pradesh	0	0.00	0	0.00	0.00	0	0.00	0	0	0	0	0	0	0	0	0	0.00	0	0.00	0.00
3	Uttarakhand	1	664.37	1	664.37	472.55	11	116.34	11	116.34	18.85	0	0.00	0	0.00	0.00	12	780.71	12	780.71	491.40
4	Haryana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0.00	0.00
5	Punjab	1	25.96	0	0.00	0.00	0	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	1	25.96	0	0.00	0.00
	Total North Western	**6**	**757.97**	**5**	**732.01**	**506.37**	**12**	**506.09**	**11**	**116.34**	**18.85**	**2**	**492.51**	**2**	**281.55**	**281.55**	**20**	**1756.57**	**18**	**1129.90**	**806.77**
III	**Central Western**																				
1	Uttar Pradesh	3	1273.10	3	1273.00	0.00	14	269.33	1	11.15	0.00	0	0.00	0	0.00	0.00	17	1542.43	4	1284.15	0.00
2	Madhya Pradesh	0	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00
3	Chhattisgarh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0.00	0.00
	Total Central Western	**3**	**1273.10**	**3**	**1273.00**	**0.00**	**14**	**269.33**	**1**	**11.15**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0.00**	**17**	**1542.43**	**4**	**1284.15**	**0.00**
IV	**Eastern Zone**																				
1	West Bengal	4	205.00	4	205.00	144.00	2	7.060	2	1.73	1.73	6	17.71	6	17.71	17.71	12	229.77	12	224.44	163.44
2	Bihar (2013-17)*	1	784.28	1	784.28	114.13	1	795.80	1	795.80	0.00	1	6064.20	1	6064.20	1246.87	3	7644.28	3	7644.28	1361.00
3	Jharkhand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0.00	0.00
4	Orissa	2	698.22	2	698.22	443.88	1	2362.04	1	2362.04	914.99	0	0.00	0	0.00	0.00	3	3060.26	3	3060.26	1358.87
	Total for Eastern	**7**	**1687.50**	**7**	**1687.50**	**702.01**	**4**	**3164.90**	**4**	**3159.57**	**916.72**	**7**	**6081.91**	**7**	**6081.91**	**1264.58**	**18**	**10934.31**	**18**	**10928.98**	**2883.31**
	North Eastern States																				
1	Assam	0	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00
1a	Karbi Anglong	0	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00
2	BTC	0	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00
3	Ar.Pradesh	0	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00
4	Manipur	0	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00
5	Meghalaya	0	0.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00
6	Mizoram	1	261.65	1	98.00	98.00	0	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	1	261.65	1	98.00	98.00
7	Nagaland	1	200.00	1	112.60	56.00	0	0	0	0	0	0	0	0	0	0	1	200.00	1	112.60	56.00
8	Sikkim	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0.00	0.00
9	Tripura	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0.00	0.00
	Total North Eastern	**2**	**461.65**	**2**	**210.60**	**154.00**	**0**	**0.00**	**0**	**0.00**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0.00**	**2**	**461.65**	**2**	**210.60**	**154.00**
	Grand Total	**49**	**10576.02**	**39**	**8017.86**	**5884.98**	**44**	**36469.53**	**24**	**33354.42**	**3987.59**	**48**	**43386.42**	**46**	**42888.13**	**23065.35**	**141**	**90431.97**	**109**	**84260.41**	**32937.92**

Annexure-IV(A)

STATE-WISE RAW SILK PRODUCTION DURING 2015-16

State	Mulberry plantation (Hectare)	Mulberry Raw Silk (MT)			Vanya Silk (MT)			Total	Total (M+V) (MT)
		Bivoltine hybrids	Cross Breed	Total	Tasar	Eri	Muga		
Andhra Pradesh	29829	708	4378	5086					5086
Arunachal Pradesh	341	3		3		32	2	34	37
Assam	7765	32	7	40		3143	142	3285	3325
Bihar	743		19	19	41	8		48	67
Chhattisgarh	771	0.35	8	9	254			254	263
Haryana	171	1		1					1
Himachal Pradesh	2088	32		32					32
Jammu & Kashmir	8237	127		127					127
Jharkhand	372		3	3	2281			2281	2284
Karnataka	87598	1344	8479	9823					9823
Kerala	141	11		11					11
Madhya Pradesh	5597	107	93	200	56	1		57	257
Maharashtra	3947	249	3.8	252	22			22	274
Manipur	7338	133	10	144	4	370	1	375	519
Meghalaya	3009	15		15		824	18	842	857
Mizoram	3843	46	9	55	0.01	9	0.1	9.1	64
Nagaland	743	4	3	7	0.1	622	2	624	631
Odisha	584	2.60	0.40	3	107	7		114	117
Punjab	1129	0.76		0.76					0.76
Sikkim	198	4		4		2.7	0.3	3	7
Tamil Nadu	16160	1532	366	1898					1898
Telangana	2509	89	26	116	1				116
Tripura	3161	22	31	52					52
Uttar Pradesh	4199	91	109	200	20	36		56	256
Uttarakhand	2974	30		30					30
West Bengal	15500	31	2320	2351	34	6	0.21	40	2391
Grand Total	**208947**	**4613**	**15865**	**20478**	**2819**	**5060**	**166**	**8045**	**28523**

Source: Compiled from MIS reports received from State Sericulture Departments

Annexure-IV(B)

STATE-WISE RAW SILK PRODUCTION DURING 2016-17

State	Mulberry plantation (Hectare)	Mulberry Raw Silk (MT)			Vanya Silk (MT)			Total	Total (M+V) (MT)
		Bivoltine hybrids	Cross Breed	Total	Tasar	Eri	Muga		
Andhra Pradesh	33156	1056	4914	5970	1			1	5971
Arunachal Pradesh	100	2		2		42	1	43	45
Assam	7898	52		52		3619	139	3759	3811
Bihar	421	6	18	23	44	10		53	77
Chhattisgarh	322	0.32	7	8	353			353	361
Haryana	183	1		1					1
Himachal Pradesh	2245	32		32					32
Jammu & Kashmir	8444	145		145					145
Jharkhand	372		1	1	2630			2630	2631
Karnataka	91492	1488	8083	9571					9571
Kerala	126	11		11					11
Madhya Pradesh	5597	30	54	84	26			26	111
Maharashtra	3480	228	3	231	27			27	258
Manipur	7548	149	12	161	5	363	1	369	529
Meghalaya	3209	28		28		872	27	899	927
Mizoram	4009	47	18	65	0.02	11	0.26	11	76
Nagaland	290	7	1.37	8	0.08	669	1	670	678
Odisha	686	3	0.11	3	116	6		122	125
Punjab	1129	3		3					3
Sikkim	198	6		6		3.00	0.17	3	9
Tamil Nadu	17574	1627	288	1914					1914
Telangana	2650	105	7	112	7			7	119
Tripura	2450	75		75					75
Uttar Pradesh	4212	97	114	211	22	36		58	269
Uttarakhand	3029	31		31	0.02	3		3	34
West Bengal	15990	38	2486	2524	37	4	0.20	41	2565
Grand Total	**216810**	**5266**	**16007**	**21273**	**3268**	**5637**	**170**	**9075**	**30348**

Source: Compiled from MIS reports received from State Sericulture Departments