FUNCTIONING OF CENTRAL SILK BOARD
&
PERFORMANCE OF INDIAN SILK INDUSTRY

(As on 1st April, 2021)

CENTRAL SILK BOARD

(Ministry of Textiles, Govt. of India)

BANGALORE-560 068

FUNCTIONING OF CENTRAL SILK BOARD & NOTE ON SERICULTURE

A. FUNCTIONING OF CENTRAL SILK BOARD

The Central Silk Board (CSB) is a Statutory Body, established during 1948, by an Act of Parliament (Act No.LXI of 1948). It functions under the administrative control of the Ministry of Textiles, Government of India, having head quarter at Bengaluru. The Board comprises 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 Chairperson of the Board to be appointed by the Central Government and not more than three officials to be nominated by the Central Government, one of whom shall be the head of the Silk Division in the Ministry of Textiles as the Vice-Chairperson and another one shall be the Secretary of the Board, both being the officers not below the rank of Joint Secretary to the Government.

In order to co-ordinate the sericulture development programmes in different States and for undertaking pre-shipment inspection of silk goods meant for exports, the Central Silk Board has established 4 Regional Offices at New Delhi, Kolkata, Hyderabad and Guwahati. Regional Offices of CSB maintain a close liaison with the State Sericulture Departments, field units and CSB field functionaries to co-ordinate transfer of technology. Regional Offices also conveners of State Level Sericulture Co-ordination Committee meetings constituted by the Central Silk Board. The existing staff strength of CSB is 2,156 as on 01.04.2021.

The mandated activities of CSB are Research and Development, maintenance of four tier silkworm seed production network, leadership role in commercial silkworm seed production, standardizing and instilling quality parameters in the various production processes and advising the Government on all matters concerning sericulture and silk industry. These mandated activities of Central Silk Board are being carried out by the 163 units of CSB located in different States through an integrated Central Sector Scheme viz "**Silk Samagra**" an integrated scheme for development of silk industry with the following four components:

1. Research & Development, Training, Transfer of Technology and I.T. initiatives.
2. Seed Organization.
3. Coordination and Market Development.
4. Quality Certification Systems, Export, Brand Promotion & Technology up-gradation.

1. RESEARCH & DEVELOPMENT, TRAINING, TRANSFER OF TECHNOLOGY AND I.T. INITIATIVES

The Research and Training Institutes of the CSB provide scientific and technological support for enhancing production and productivity for sustainable sericulture through innovative approaches. The main institutes at Mysuru (Karnataka), Berhampore (West Bengal) and Pampore (Jammu and

Kashmir) deal with Mulberry sericulture, whereas Ranchi (Jharkhand) deals with Tasar culture and Lahdoigarh, Jorhat (Assam) deals with Muga, Eri and Oak tasar culture. Regional Sericulture Research Stations 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 Centre (RECs) and its sub units are also functioning to provide extension support to sericulturist's. In order to provide Research and Development support in post cocoon sector, the Board has established Central Silk Technological Research Institute at Bengaluru. In addition, the CSB has also set up Silkworm Seed Technology Laboratory in Bengaluru (Karnataka), Central Sericultural Germplasm Resource Centre at Hosur (Tamil Nadu) and Seri Biotech Research Laboratory at Bengaluru.

During the year 2020-21, a total of 36 new research projects have been initiated, 26 projects have been concluded by various Research and Training institutes of CSB and currently a total of 106 research projects viz., 46 in Mulberry Sector, 29 in Vanya Sector, 17 in Post cocoon sector and 14 in specialized sectors (Germplasam, Seed science and Biotechnology) are under progress.

Research & Development (Highlights of Research Programmes)

(i) R&D on Mulberry Host Plant:

- Evaluated mulberry varieties for suitability of chawki rearing in subtropical conditions and suitability of elite mulberry varieties at different altitudes of Uttarakhand.
- Evaluated nine test genotypes and check S1635 under FYT cum MLT for high yielding mulberry genotypes with early sprouting behaviour capable of producing sustainable leaf yield during winter months.
- Identified eight high water and nutrient use efficiency accessions viz., MI-0437, MI-0310, MI-0683, ME-0173, MI-0246, MI-0685, MI-0762 and ME-0256 to develop climate resilient mulberry varieties.
- Optimized whole plant regeneration protocol for photosynthetic efficient transgenic development using cotyledon and hypocotyl explants of G4 mulberry cultivar.
- Developed putative transformed and rooted mulberry plantlets containing PEPC+PEPCK genes and CA genes contributing towards higher photosynthetic efficiency.
- Developed protocol for *Agrobacterium* mediated genetic transformation in cotyledons/hypocotyl explants of G4 mulberry using AtDREB2A+AtSHN1 gene construct.
- Popularized and commercialized a product viz. Rot-fix developed for control of root rot disease in mulberry.
- Evaluated 415 diverse mulberry germplasm for root knot disease caused by Meloidogyne incognita and identified eight resistant germplasm accessions viz. BR-8, Karanjtoli-1, MI-0437×MI-0364 (P-2), Nagalur Estate, Tippu, Calabresa, Thai Pech & SRDC-3.
- Protection of Plant Varieties & Farmers' Rights Authority (PPV&FRA) has accepted to register the high yielding mulberry variety G-4 for Distinctiveness, Uniformity and Stability (DUS) test.

- A co-nodal DUS test centre was established at CSRTI, Berhampore, West Bengal to test mulberry varieties developed at North and North-eastern zone.
- Identified four genotypes highly tolerant to alkalinity stress (pH>9) viz., Sahana (MI 0524), Bheria dangi-1 (MI 0822), T-36 (MI 0226) and Kanthaloor-2 (MI 0449) to utilize for future breeding programmes.
- Crosses of alkaline tolerant genotypes MR2 and Sahana with susceptible genotype V1 (MR2×V1 & Sahana×V1) were made to develop mapping population and to identify Quantitative Trait Locus (QTL) governing alkalinity tolerance in mulberry.
- Identified five promising drought tolerant and high yielding mulberry genotypes (PYD-1, PYD-4, PYD-7, PYD-8 & PYD-21) with >15% leaf yield improvement over drought tolerant (C-1730) and >6% over ruling check (C-2038) varieties for rain fed conditions. Identified high yielding mulberry genotypes (C-01 & C-11) with an improvement over S1635 under irrigated (>30%) and rain fed (>20%) conditions.
- Identified high yielding mulberry genotypes (PPY-8, PPY-10, PPY-24, PPY-7, PPY-20 & PPY-6) with 10-35% improvement over check variety (C-2038) with better quality and lower PDIs under northeastern states.
- Established 231 (183 indigenous and 48 exotic) diverse mulberry germplasm with 5 replications under ARBD design for exploring the genetic potentiality of yield through Marker Assisted Breeding (MAB).
- Developed AFP-2 (Alpha-Fetoprotein) mediated suppression (41-55%) of fungal diseases caused by *Myrothecium roridum* (leaf spot; MLS) and *Fusarium solani* (dry root rot; FRR).
- Characterized 24 new mulberry accessions for morphological, reproductive, anatomical traits and evaluated. Based on the preliminary yield assessment and morphological evaluation, 10 better performing accessions viz. MI-0857, MI-0837, MI-0980, MI-0838, MI-0858, MI-0962, MI-0966, MI-0973, MI-0974 and MI-0841 were identified.
- Analyzed MLO (Mildew resistance locus O) proteins of mulberry with MLOs from other dicot species, phylogeny was established for identification of clade V MLO genes and identified five clade V specific MLO genes which are likely involved in powdery mildew susceptibility by Screening for powdery mildew resistant genes and validation of CAPS marker for Chalcone synthase.
- Collected 20 new mulberry genotypes and planted in the nursery, 18 were collected in unexplored areas of Tura, Meghalaya and one each from CSR&TI, Berhampore and Pampore.
- All India Coordinated Experimental Trials for Mulberry (AICEM) phase IV with Mulberry varieties AGB-8, C-1360 and PPR-1 has been initiated at 20 test centers across the country.
- During the last 10 years, 14 mulberry varieties have been released for commercial exploitation.

R&D efforts have helped in improving the mulberry productivity from 50 MT/Ha/yr during 2005-06 to 62 MT/Ha/yr during 2019-20.

(ii) R&D on Mulberry Silkworm:

- Development of GBS based SNP genotyping.
- Evaluation of S8 x CSR16 found to be a single hybrid with high productivity, high cocoon shell percentage and gradable silk.
- Two bivoltine silkworm hybrids (RDIN1 & RDIN2) have been developed for multi-viral diseases tolerant.
- Validation of MASN hybrids showed better or at par performance in Eastern India to ruling hybrids for survival and yield traits.
- Commercialization of the uzi lure has been taken up by ICAR-NBAIR and presented the technology to ITMC (Institute Technology Management Committee) on 27.10.2020 and it was approved by the committee to commercialise the technology with a cost of Rs. 3.00 lakhs. So far two firms are interested to purchase the technology.
- Congenic lines including one multivoltine (28RY) and one bivoltine (29RC) have been developed with the targeted traits.
- Evaluation of 63500 dfls (Target: 33500) of PM x MASN4 evaluated among farmers of Karnataka and Andhra Pradesh and average yield obtained was 58.0kg/ 100 dfls against 62.1kg/100 dfls in Control (PM x CSR2) and 94750 dfls of MASN4 x CSR4 (Target: 108000) was evaluated among farmers of southern India and average yield obtained was 62.12kg/100 dfls against 68.875kg/ 100dfls in control (FC1 x FC2).
- Two bivoltine hybrids namely RDIN1 and RDIN2 has been developed for multi-viral tolerance using Marker-assisted selection. Eight SSR markers have been identified that are linked to viral diseases. These markers are characterised at molecular level and could be used as markers for future diseases resistant breeding programs.
- Validation of DNA markers for NPV resistance and stress tolerance, MASN x CSR4 and N x MASN performed better than the controls in terms of productivity and silk quality.
- Developed new bivoltine double hybrid BFC25 x BFC11 by utilizing Bulgarian and Indian silkworm genetic resources, which showed shell ratio 23.8%, filament length of 1,095 meter and renditta of 5.8.
- Conducted Transcriptomic analysis for silk quality in silkworm, mannosidase and ubi1 were found to be potential regulators involved in silk fibroin synthesis, which influence the fibroin synthesis pathway and silk quality.
- Genotyped 100 silkworm accessions with 20 SSR (Simple Sequence Repeats) markers concurrently evaluated for nine quantitative & five qualitative traits and assembled a germplasm which is genetically diverse with high variation in pupation rate, thermo tolerance, cocoon weight, shell weight, shell ratio, and key yield components, which could be exploited in developing superior genotypes for tropical conditions of India.
- Evaluated a bivoltine single hybrid S8 x CSR16 (2,84,550 DFLs) under authorization trials, which recorded an average cocoon yield of 69.0Kg/100 DFLs, single cocoon wt., 1.782g, single shell wt., 0.395g and shell ratio of 22%.
- Identified 12Y x BCon1.4 (12Y x BFC1) as a promising multi x bi hybrid through OFT in Eastern & NE states (avg. yield: ~52kg with ~10% improvement over N x SK6.7).
- Developed a bivoltine double hybrid (BHP3.2 x BHP8.9) with an improved shell (10-12%) over SK6 x SK7 & Bcon1 x Bcon4 (avg. yield: ~65kg).

- The crossbreed of ICB29 (an improved pure MV breed) with S8 has developed, which produces 2A grade silk at par with MV1 × S8 and it is superior over the existing crossbreed PM × CSR2. No hibernation was observed in crossbreed of ICB29 with bivoltine S8 and CSR2.
- An improved Cross Breed, MV1 × S8 (Cauvery Gold) evaluated under authorization trails, showed an average cocoon yield of 60 - 65 kg /100 DFLs, renditta 6-6.5, shell ratio of 21.65%, raw silk recovery 15.41% and fibre quality of 2A-3A grade.
- An Entomopathogenic fungus *Isaria javanica* which causes grey muscardine in silkworm (first report from India) was isolated from Karnataka and the LD50 of the isolated strain is calculated as 3x105 conidia/ml. The molecular characterization of the fungus was done and the genetic sequence has submitted to NCBI (accession number MH712278.1).
- Validated the M-LAMP assay for tasar and the results were in conformity with the microscopic testing.
- Pheromone trap against silkworm uzi fly is being demonstrated and popularized.
- Developed a general disinfectant, NIRMOOL for disinfection of silkworm rearing house and appliances.
- Developed molecular markers (py1 & py2) to assess humidity tolerance in silkworm.
- Developed & verified a new technology for egg enhancement in Bivoltine hybrids (FC1 x FC2) by application of host plant volatiles with increased egg production by 8.5g per kg of cocoons.
- Recombinant silk Fibroin- Cecropin B, a fusion protein expression was achieved in a heterologous expression system. This silk fusion protein was effective against gram-positive and gram negative bacteria. It has shown enhanced wound healing activity in rats and human dermal cells. The fusion protein has also shown strong activity against oxidative stress.
- Developed transgenic silkworms to over-express antimicrobial genes Relish 1 and Drosomycin B. Successful over expression of Relish in transgenic silkworms has shown enhanced resistance / tolerance against major pathogens.

R&D efforts have helped in improving the yield from 48 Kg/100 dfls during 2005-06 to 65 Kg/100 dfls during 2019-20.

(iii) R&D on Vanya Host Plant:

- Identified potential PSB, 20 Azotobacter & 3 Pseudomonas isolates & are evaluated in pot condition.
- Four semi-synthetic diets were prepared with different combination of ingredients along with Som and Soalu leaf powders.
- Assessed phytochemical diversity of Som under three different agro-climate zones of Meghalaya and Assam revealed the region and season specific differences in the phytochemical quantities, stress magnitude and intrinsic protection potential of Som. It is established that the magnitude of soil intrinsic nutritional capacity in som fields varies in different agro-climatic zones.
- A formulation of native rhizobacteria having antagonistic effects against *Alternaria* blight has developed for management of castor blight disease,

enhancing plant growth and productivity of the leaf biomass, which is under on station trials.

- ❖ Geographical coordinates of 08 wild / cultivated perennial castor accessions growing in North East were collected for their utilization in the pre-breeding programme. Collection of wild perennial castor accessions from the field has brought variability to the gene pool for its further exploitation.
- ❖ Assessed impact of petroleum crude oil activities on muga culture in Assam, observed adverse effects of petroleum pollutants on muga culture. The finding has facilitated in devising the suitable mitigation measures to revive the muga culture in contaminated areas.
- ❖ 1452 soil samples were collected and analyzed covering North East states viz. Assam, Nagaland, Manipur, Meghalaya, Mizoram and Arunachal Pradesh.
- ❖ In the last 10 years, four Vanya host plants have been identified and recommended for commercial exploitation.

(iv) R&D on Vanya Silkworm:

- ❖ Identified real hybrids of *T. arjuna* and *T. tomentosa* for higher leaf yield and quality using various molecular tools.
- ❖ Developed a technology for enhancing egg laying in Vanya Silk moths by application of host plant volatiles.
- ❖ Formulation of Semi-synthetic diet for rearing of Muga silkworm, *Antheraea assamensis* Helfer.
- ❖ Isolation and characterization of lytic bacteriophages infecting bacterial pathogens of Muga silkworm *Antheraea assamensis*.
- ❖ Developed control measures on the cross transmission of pebrine spores from lepidopteran caterpillars to Muga silkworm *Antheraea assamensis* Helfer.
- ❖ *In-situ* Conservation of Muga and other wild silk moths in natural habitat
- ❖ Developed a diagnostic tool for early detection of baculovirus causing tiger band disease in *Antheraea proylei.*
- ❖ Development of Seed cocoon and Seed preservation technology for Tropical Tasar Silkworm (*Antheraea mylitta* D.).
- ❖ Developed 18 days preservation schedule for the three days Muga eggs, With 2 days post preservation/ incubation period resulted in 85% hatching.
- ❖ Developed short term seed preservation schedule for Tasar silkworm BDR10 mixed eggs (at 15°C for 15 days) with two days progressive incubation (totaling 17 days) resulted in 90% hatching.
- ❖ Standardized DNA bar coding techniques for assessment of wild silk moth diversity in Nagaland. Sequencing data has submitted for open source database.
- ❖ Eco-friendly bait method was developed to control potential bug predator (*Eocanthecona furcellata* Wolff) in Muga ecosystem.
- ❖ Developed a model for prediction of percent flacherie infestation using Geospatial technique, which alerts farmers to take proper precautionary measures to avoid disease out-break in advance.
- ❖ Developed a formulation using potential bio-desulfurizing bacterium isolated from crude oil polluted soils for reclamation of the polluted soil, which is under OST validation.

- ❖ Solar LED light traps of different wavelengths has developed and installed in muga rearing fields for controlling major insect pests and predators in muga ecosystem. The technique is being demonstrated under various awareness programmes in Assam and Arunachal Pradesh.
- ❖ Validated a diagnostic tool for early detection of baculovirus causing Tiger band disease in Oak Tasar (*Antheraea proylei)*. Standardized an effective sodium hypochlorite based egg disinfection technique to minimize tiger band disease.
- ❖ Whole-Genome 10X linked library of Tasar Silkworm, *Antheraea mylitta* has prepared with 10X chromium technology at an average size of the 544bp and sequenced the 10X chromium libraries on Illumina HiSeq X 10 with 2x150 pair end chemistry.
- ❖ In the last 10 years, 5 Vanya silkworm breeds have been developed are under field trials for commercial exploitation.

(v) R&D on Post Cocoon Technology:

- ❖ Developed a solar operated cocoon stifling/drying chamber, solar cooker for Tasar cocoons cooking/softening.
- ❖ Developed/modified, existing reeling, re-reeling, winding, doubling and twisting machines to be operated by solar.
- ❖ Development of silk yarn finishes.
- ❖ Development of an apparatus to estimate the reelability of cocoons.
- ❖ Developed an optimum line of machinery under Miniature concept for Eri spinning.
- ❖ Identified some of the chemicals possessing solubility characters for mulberry silk.
- ❖ In Vanya sector, wet reeling of tasar and Muga cocoons, sizing machine for tasar silk, modified dry reeling machine for tasar cocoons, pressurized hank degumming machine and equipment for recycling of silk reeling water are being popularized in field.
- ❖ Developed technology for development of diversified silk knitwear products/ garments using international quality Indian silk.
- ❖ In Vanya silk post cocoon sector: Wet reeling of tasar and Muga cocoons, Sizing machine for tasar silk, modified dry reeling machine for tasar cocoons, Pressurized hank degumming machine and Equipment for recycling of silk reeling water are being popularized in field.
- ❖ Molecular weight determination of Red Eri Silk Sericin was done by SDS PAGE and standardized enzymatic hydrolysis of white and Red Eri-silk sericin using protex 6L and hydrolyzed White Red Eri silk Sericin in powdered form.
- ❖ Developed package for Daba, Raily and Modal ecoraces with different concentrations of sodium carbonate and sodium bi- carbonate combined with varying boiling and steaming time to improve the cooking efficiency & reeling performance without affecting the colour/ luster and tensile properties of the silk fibroin. The technology is cost effective and the chemicals are easily available.
- ❖ Designing and fabrication of Solar Cooker and low power consumption Hot Air Dryer were completed.

R&D efforts have helped in improving the Renditta from 8.2 during 2005-06 to 6.2 during 2019-20.

(vi) Patents (applied/granted) for Technologies/Products/Process & Commercialization:

a. Patent applied:

1. Process for extraction and concentration of α-linolenic acid from silkworm, *Bombx mori* pupae [Indian patent Appl. no. 202041042040, dated 25th September 2020]- CSRTI Mysuru.
2. A pest attractant composition and method of preparation thereof for uzi fly, *Exorista bombycis* (Joint patent by NBAIR and CSRTI, Mysuru - Filed by NBAIR, Bangalore). Indian patent Appl. no. 202011034663 dated August 12th 2020- CSRTI Mysuru.
3. Nirmool (No.TEMP/E-1/55625/2020-KOL dated 17-11-2020)- CSRTI Berhampore.
4. A method for soil microbial activity (No.TEMP/E-1/62723/2020-KOL dated 24-12-2020)- CSRTI Berhampore.
5. Indigenous conveyor cocoon cooking machine with a capacity of 250-300kg-CSTRI Bengaluru.
6. Automatic conveyor cocoon drying machine, an indigenous conveyor hot air direr of 1000/2000 kg capacity- CSTRI Bengaluru.
7. Void silk reeling and spinning machine for developing new type of void raw and fabrics with unique appearance- CSTRI Bengaluru.

b. Patent granted:

1. Process for converting sericulture waste in to valuable products (Patent No. 337598 granted on 29/05/2020) - CSRTI Mysuru.
2. A process for the extraction of Fibroin from *Bombyx mori* (Patent No. 343655 granted on 07/08/2020)-CSRTI Mysuru.
3. A process for culturing Cordyceps (Patent No. 346580 granted on 11/09/2020) - CSRTI Mysuru.
4. Sericilin (Patent No. 342953) - CSRTI Berhampore.
5. Process of obtaining phyto-ecdysteroids from weeds of *Amaranthacae* for synchronized maturation of mulberry silkworm (Patent No. -) - CSRTI Pampore.

c. Commercialization:

1. Process for converting Sericulture waste into valuable products-Application submitted to NRDC, New Delhi on 08/06/2020- CSRTI Mysuru.
2. Technology for extraction and concentration of α-linolenic acid from silkworm, *Bombx mori* pupae oil Application submitted to NRDC, New Delhi on 03/07/2020- CSRTI Mysuru.
3. Uzi fly pheromone trap commercialization was under taken by NBAIR, Bangalore through ICAR (A Joint Product developed by NBAIR and CSRTI, Mysuru) - CSRTI Mysuru.
4. NIRMOOL (Under progress through NRDC)- CSRTI Berhampore.
5. Multi Utility shelf rearing stand - CSRTI Pampore.

(vii) Collaborative and externally funded R & D projects:

- CSB R&D institutes, in addition to the in-house funded projects, externally funded research projects were also implemented with the financial assistance from DBT, DST, PPV&FR, MNRE, NERTPS, Swedish

Govt. etc. As on March., 2021, a total of 16 research projects with external funding are being carried out.

- ❖ CSB R&D institutes, in addition to the multi-institutional (within CSB) collaboration, CSB also collaborated with other research Institutes such as IISC Bengaluru, NESAC Shillong, ICAR-IIHR Bengaluru, ICAR-NBAIR Bengaluru, ICAR-CFIRI Kolkata, CSIR-NEIST Jorhat, CSIR-CFTRI Mysuru, KVK Bengaluru, NCL Pune, JNU New Delhi, UDSC New Delhi, University of Bengal Siliguri, Assam Agriculture University Jorhat, TTRI Jorhat, TERI Bengaluru, R.V. College of Engineering Bengaluru, NIE Mysuru, PRADAN, Vel Tech Institute Chennai etc. At present, 18 such projects are being carried out in collaboration with these institutes/ organizations.
- ❖ International collaboration with different institutes has also been undertaken. At present, two research projects entitled "Molecular characterization of Ifla virus infecting tasar silkworm" with Swedish Research Council, Sweden and "Improvement of Mulberry and Silkworm Breeding in Temperate Regions of India and Uzbekistan" with Uzbekistan have been taken up.
- ❖ MOU has been made with research institutions in Bulgaria, Japan, China, and Australia for exchange of Genetic material to improve hybrid vigor of mulberry silkworm.

Training

The R&D institutions of CSB spread across the country are intensively involved in training, skill seeding and skill enhancement on a sustainable basis, covering all activities of the silk value-chain pertaining to all the four silk sub-sectors. CSB's capacity building and training initiatives have been structured under the following five heads:

(i) Skill Training & Enterprise Development Programmes (STEP): Under this category a variety of short-term training modules focusing on Entrepreneurship development, In-house and industry Resource Development, Specialized Overseas Training, popularization of sericulture technologies, lab to land technology demonstration programmes, training impact assessment surveys etc. have been planned. Some of the popular programmes under this component are: Entrepreneurship Development Programme, Technology Up-gradation Programme, Resource Dev. Programme / Trainers Training Programme, Competency Enhancement Training Programme, Disciplinary Proceedings Training, Management Development Programme etc.

(ii) Establishment of Sericulture Resource Centre (SRC): SRCs are training cum facilitation centres established in a select Mulberry Bivoltine & Vanya clusters with a unit cost of Rs.2.00 lakhs each to act as an important link between Extension Centres of R&D labs and the beneficiaries. The purpose of these SRCs is - technology demonstration, skill enhancement, one-stop shop for Seri-inputs, doubt clarification and problem resolution at cluster level itself. As on date 23 SRCs are functioning.

(iii) Capacity Building & Training by R&D Institutes of CSB: In addition to conducting structured long-term training programme (Post Graduate

Diploma in Sericulture & Intensive Sericulture Training) the R&D institutes of CSB also conduct technology-based training both for farmers and other stakeholders besides organizing Krishi Melas, Farmer's day, farmer's interaction workshops etc. for empowering the framers and other industry stakeholders.

(iv) Capacity Building in Seed Sector: Silkworm seed is the most critical sector that drives the entire silk value chain. The quality of seed determines the quality of industry output. Therefore, addressing the capacity building and training needs of this sector is of paramount importance. It is proposed to conduct a variety of training programmes to cover industry stakeholders like – Pvt. Silkworm Seed Producers, Adopted Seed Rearers, Managers and work force attached to Govt. owned grainages.

(v) SAMARTH: The textile and apparel industry is one of the earliest industries developed in India. It is the biggest employer next to agriculture. In order to meet the skill gap in the industry, the Government of India launched the scheme "**Samarth"-** a "Scheme for Capacity Building in Textile Sector (SCBTS)", with an outlay of Rs. 1300 crore. The broad objective of the scheme is to skill the youth for gainful and sustainable employment in the textile sector, to provide demand driven, placement oriented NSQF compliant skilling programmes covering the entire value chain of textiles, to promote skilling and skill upgradation in the traditional sectors of handlooms, handicrafts, sericulture and jute, and to enable provision of sustainable livelihood either by wage or self-employment to all sections of the society across the country.

The Central Silk Board is one of the sectoral organization under Ministry of Textiles carrying out multifaceted task such as Physical verification of Training centres, Implementing Partner for conducting the training across the country and also as a ToT agency in Silk sector.

The details of number of persons trained under the above said programmes organized by the Research & Training Institutes of CSB during the years 2018-19, 2019-20 and 2020-21 is given below:

#	Training courses	No. of persons Trained					
		2018-19		2019-20		2020-21	
		Target	Achmt.	Target	Achmt.	Target	Achmt.
1	Structured Courses (PGDS, Mulberry & Non-Mulb. Courses & Intensive	230	191	130	121	150	109
2	Farmers Skill Training, Technology Orientation Programmes, Capsule & Adhoc Courses and Exposure Visit and training in seed sector	8290	8050	10025	8100	6865	6454
3	Other Training Programmes	3045	4862	4050	4560	1490	1434
4	STEP	1260	782	1545	717	860	780
5	Training under SRC					2500	3301
6	SAMARTH					1360	726
	TOTAL	**12825**	**13885**	**15750**	**13498**	**13225**	**12804**

Transfer of Technology (TOT):

The technologies emanated out of the concluded projects are being effectively transferred to the field through various Extension Communication Programmes (ECP) viz, Krishi Melas, Group Discussions, Enlightenment programmes, Field Days, Farmers' Meet, Audio Visual programmes, Technology demonstrations etc. During 2020-21, a total number of 576 ECPs were organized under pre-cocoon sector and various technologies developed by the institutes were transferred effectively among 24988 stakeholders. Similarly, 907 ECPs were organized and technologies were effectively transferred among stakeholders under post cocoon sector. Further, 75309 samples viz., cocoon, raw silk, fabric, dyes, water were tested for various parameters.

I.T. Initiatives:

- **mKisan:** CSB has widened the outreach of scientists and experts to disseminate information to provide scientific advisories to farmers through their mobile phones using mKisan Web Portal. All the main institutes are regularly providing advisories thru this portal. Till 31-03-2021 total of 769 advisories and 83,64,555 SMS messages were sent.
- **'SMS service'** through mobile phone on day-to-day market rates of Silk and Cocoons for the use by the farmers and other stakeholders of the industry. Both PUSH and PULL SMS services are in operation. Mobile numbers received from DOS are updated and all the registered **12,659** farmers are receiving SMS messages on daily basis.
- **SILKS Portal:** Sericulture Information Linkages and Knowledge System portal has been developed in association with North Eastern Space Application Centre, Dept. of Space 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.
- **DBT MIS:** Development of DBT MIS for the scheme "Development of Silk Industry". NIC ServicePlus (Meta Data Based Application) is used to design and integrate with DBT Bharat Portal, development is under progress.
- **Video Conference:** CSB has full fledged Video Conference facility at CSB Complex, Bangalore, CSR&TI, Mysore & Berhampore, CTR&TI, Ranchi, CSR&TI, Pampore, CMER&TI, Lahdoigarh, RO, New Delhi and MSSO Guwahati. Till 31/03/2021, 297 multi-studio Video conferences and web based video conferences were also conducted.
- **CSB website:** Central Silk Board 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 organisation as well as schemes and other details. Publicity of sericulture plan programmes, achievements and sharing of success stores are featured in the website. CSB has completed the new website and in the process of getting CSB website the GIGW compliance and security audited as per Govt. of India guidelines.
- **National Database for farmers and reelers:** Farmers and Reelers data base is designed and developed to have database of Farmers and Reelers at national level, which will help policy makers with appropriate information

for effective decision making. As on 31/03/2021 total number of **7,40,493** farmers and **14,843** reelers details have been recorded by the states in the database.

- **MIS on NERTPS "Intensive Bivoltine Sericulture Development Project" in Northeastern States:** MIS for Intensive Bivoltine Sericulture is developed and hosted on dedicated servers for trouble free access by all stake holders.
- **Digitization of Board Meeting Minutes**: Digitized the minutes of Board meeting and Standing committee meeting.
- **Diary of letters** – Letters received are diarized and work allotment and Assistant diary sheet are obtained through MIS software, after successful implementation in Bills section, the same is extended to all the sections and are being used successfully.
- **Developed MIS for ARM:** Development of MIS for Automatic Reeling Machine (ARM) data collection is completed and in use.
- **Integrated MIS package:** Proposed to develop integrated web based MIS package including all the activities carried out by sections / divisions of CSB. Action initiated and collecting details from all the sections / divisions.

2. SEED ORGANISATION

The CSB has a chain of Basic Seed Farms supplying basic seeds to the States. Its commercial seed production centers augment efforts of the States in supplying commercial silkworm seed to farmers.

The Table below indicates the total quantity of seed production during the year 2018-19, 2019-20 and 2020-21.

(Unit: Lakh dfls)

Particulars	2018-19		2019-20		2020-21	
	Target	Achmnt.	Target	Achmnt.	Target	Achmnt.
Mulberry	440.00	483.04	470.00	399.87	410.00	356.18
Tasar	51.02	51.08	51.17	55.53	52.77	47.37
Oak Tasar	0.64	0.78	1.48	0.44	0.576	0.50
Muga	8.16	5.33	5.65	5.71	5.86	5.72
Eri	6.00	7.22	6.30	6.64	6.00	6.48
Total	**505.82**	**547.45**	**534.60**	**468.19**	**475.20**	**416.25**

IT initiatives under Seed sector:

- Registration of Stakeholders under Central Seed Act:- CSB has developed web based Online registration (new/renewal) process to facilitate the stakeholders viz., Silkworm Seed Producers, Chawki Silkworm Rearer and the Silkworm Seed Cocoon Producers through www.csb.gov.in / https://nssoregwebpages.firebaseapp.com, which eases the process of paperless submission/transaction for registration in online mode.

- "e Cocoon" mobile application: As a part of quick and real-time monitoring by the Seed Analysts /Seed Officers under Central Seed Act, CSB has

developed an Android based mobile application "e-Cocoon" for onsite/online reporting of the inspection proceeds of Seed Officers and Seed Analysts.

3. COORDINATION AND MARKET DEVELOPMENT.

Central Silk Board administration includes Board Secretariat, Regional Offices, Certification Centers and Raw Material Banks. The Board Secretariat of CSB monitors the implementation of various schemes and coordinates with Ministry and States in implementation of various projects in sericulture sector. Several National meetings, Board meetings & Review meetings and other high level meetings are being carried out by the Board Secretariat. The Raw Material Banks operate floor price to stabilize the market price of cocoons to ensure remunerative price to primary producers.

PRODUCT DESIGN, DEVELOPMENT AND DIVERSIFICATION (P3D)

The activities under P3D are to give 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, commercialisation of developed products, assisting the commercializing partners in providing backward linkage, technical know-how and assisting/coordinating in sample development.

Activities of P3D:

- Revival of Traditional Silk Products
- Design development and diversification of products with blends
- Product development based on certain identified preferences and requirement in terms of both their design and end uses
- Generating market information, updating market data and forecasting fashion trends.
- Generic and Brand promotion of Indian Silks by organising theme pavilions and display of products in silk expos /exhibitions.
- Assist silk manufacturers and exporters in development of innovative designs and fabrics in tune with the market demand.
- Display of latest developments in silk products and ultimately to create a Centre of excellence for innovations in Indian Silks.

Products Developed:

1. Muga Satin fabric on power loom and Garments
2. Eri silk denim fabrics for Blazer and garments, Eri and Mulberry knits, Eri silk blanket and carpet & Eri silk thermal wear.
3. Tasar silk fabric on power looms for bridal dress.
4. Pure silk sarees and Fabrics in Chanderi cluster
5. Kanchipuram sarees with Muga silk is designed for replacement of Zari.
6. Stain guard and Aroma treated sarees
7. Silk life style products – Ladies purse, bags, socks, glouse, accessories
8. Silk sarees /fabrics printed in Bagh (MP) cluster
9. Products with traditional Lambani art work

10. Mulberry x Eri sarees with Bomkai Design
11. Mulberry saree with Nagaland tribal motif and Silk /linen, silk / cotton, silk / modal fabrics

4. QUALITY CERTIFICATION SYSTEM, EXPORT BRAND PROMOTION & TECHNOLOGY UPGRADATION

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 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 which have been established in different Cocoon Markets with the support under CDP facilitate cocoon testing. The network of Certification Centres of Central Silk Board attached to the Regional Office carryout voluntary pre-shipment inspection of silk goods meant for export to ensure quality of silk goods exported from India. Besides, Central Silk Board is popularising "Silk Mark", for purity of silk products through the Silk Mark Organisation of India (SMOI). "Silk Mark", an assurance label, protects the interests of the consumers from the traders selling artificial silk products in the name of pure silk.

The progress achieved under the Silk Mark Scheme during 2018-19, 2019-20 and 2020-21 is given below:

Particulars	2018-19		2019-20		2020-21	
	Target	Achmnt.	Target	Achmnt.	Target*	Achmnt.
Total No. of new Members enrolled	250	291	260	280	130	261
Total No. of Silk Mark Labels sold (Lakh nos.)	27	25.46	27	29.71	15	24.86
Awareness Programmes/ Exhibition/ Fairs/ Workshop/ Road shows	480	463	500	549	240	324

*The targets for 2020-21 were considerably slashed in view of the downward trend in business due to COVID19 pandemic.

Silk Mark Expos

- In order to ensure that Silk Mark gains further credibility & popularity, Silk Mark Expos are being organized exclusively for Silk Mark Authorized Users across the country. The Expos were an ideal platform not only to popularize Silk Mark but also in bringing the manufacturers and the consumers under one platform for selling and buying of pure silk products. Substantial business for the participants was getting generated during these events. During the event massive awareness and publicity campaigns are carried out by the SMOI. However, in view of the government guidelines on social distancing etc., due to COVID19 pandemic, no physical expos are being planned during 2020-21. Instead, SMOI has entered into an agreement with M/s. Amazon.in for online promotion of the 100% pure silk products with 'Silk Mark' by the Authorized Users of Silk Mark. About 25 Authorised Users of 'Silk Mark'

are on-boarded on the Amazon platform. Further, discussions are also being held with M/s. Flipkart, for the online promotion of products of our Silk Mark Authorized Users on their platform.

- 22 SMOI AUs participated in the virtual B to B "India e biz –Expo" organized by Indian Chamber of Commerce (ICC), Kolkata from 15th to 21st March-2021, which may help in promoting Indian Silk Products among domestic as well as international buyers.
- SMOI sponsored the virtual event of "Mrs. Femina", to promote Silk Mark among younger segment of silk loving community.

5. FINANCIAL PROGRESS

The table below indicates year-wise financial performance of the Central Silk Board during the years 2018-19, 2019-20 and 2020-21:

(Cr. Rs.)

BUDGET HEADS	2018-19		2019-20		2020-21	
	Allocation (RE)	Expnd.	Allocation (Approved RE)	Expnd.	Allocation (Approved RE)	Expnd.
Administrative Expenditure	481.29	481.29	577.70	575.65	447.88	447.88
Scheme Outlay- **for Silk Samagra**	120.00	117.41	209.91	209.91	202.13	202.13
Total	**601.29**	**598.70**	**787.61**	**785.56**	**650.00**	**650.00***

*provisional

6. OTHER SCHEMES

A. CONVERGENCE EFFORTS:

The Ministry of Textiles is extending support to the sericulture sector in the form of CSS (SILK SAMAGRA) & NERTPS. Efforts are also being taken for mobilizing additional funds through convergence, by availing the financial support from other schemes being implemented by various Ministries of Govt. of India. As a result of convergence of programmes like MGNREGS, RKVY and State Plan schemes etc., during the year 2019-20 projects to the tune of Rs. 1181.45 Cr were sanctioned against the projects proposed for Rs. 1264.28 crores and funds amounting to Rs 514.40 Cr were released to the sericulture sector for the organized development of silk industry in the country. Further, during the year 2020-21, States have submitted projects to the tune of Rs. 174.42 Cr and projects worth Rs. 99.55 Cr were sanctioned, funds amounting to Rs. 39.62 Cr released for the sericulture sector. Progress reports from rest of the States are still awaited.

CSB, MoT and DAC&FW, MoA&FW under SMAF have finalized the convergence model for implementation of Agro-Forestry in the Silk sector. The signing of MOU between CSB and DAC&FW for implementation of Agro-forestry in silk sector was held on 07th March, 2021. Finalization of scheme details and operational guidelines for its implementation is under process. Further, Convergence efforts with MoEF&CC for **Seri-forestry convergence** for

sericulture promotion in India are in final stages of issuance of necessary guidelines.

B. MAHILA KISAN SASHAKTIKARAN PARIYOJANA (MKSP):

Multi-state tasar projects under Mahila Kisan Sashktikaran Pariyojana (MKSP) at an outlay of Rs.7160.96 lakhs, shared by MoRD (Rs.5366.15 lakhs) and CSB (Rs.1794.81 lakhs) are being coordinated by CSB in six states, since October 2013. The project envisages creating over 36,000 sustainable livelihoods for the marginalized households, especially women in 23 districts, which are mostly Left-Wing Extremism (LWE) affected in the States of Jharkhand, Odisha, West Bengal, Chhasttisgarh, Maharashtra, Andhra Pradesh & Bihar.

Under the project, a total of 36154 farmers were covered against the target of 36108. A total of 2497 mahila kisans raised 1521 ha. tasar plantations in private waste lands. 312 nucleus seed rearers brushed 2.159 lakh dfls of nucleus seed to produce 119.4 lakh seed cocoons @ 55.30 seed cocoons per dfl, against the norms of 50 cocoons. 1620 seed rearers brushed 13.120 lakh dfls of basic seed procured from BTSSO and BSPUs, to produce 388 lakh seed cocoons@ 29.54 seed cocoons per dfl against norms of 32 seed cocoons/dfl. 367 private graineurs processed 280.45 lakh seed cocoons and produced 64.34 lakh commercial dfls @ cocoon:dfl ratio of 4.32:1 against norms of 4:1 and 65 lakhs commercial dfls were supplied in the project areas. 14227 commercial rearers brushed 65 lakh dfls procured from the private grainages under the special projects, to produce 2240 lakh reeling cocoons @ 35 cocoons per dfl.

Under human resource programme various Capacity & Institution Building training programmes were organized under the project viz, Technical training (35615 nos.), training on sectoral activities (43367 nos.), Community Resource Persons Training (1669 nos.), On-field training to CRPs (84203 nos.), etc. Further, 4883 Mahila kisans were taken exposure visits and 2 nos. trainers training programmes were organized. Six Training modules for various HRD activities and technical protocol were prepared under the projects. Also, 718 producer groups were organized, of which 13 were federated.

Scaling up projects under MKSP with CSB as NRLM support organization (NSO)

CSB being the National Rural Livelihood Mission (NRLM) support Organization (NSO) of MoRD is supporting State Rural Livelihood Missions (SRLMs) in up-scaling initiatives under tasar sector. MoRD has already approved three MKSP Tasar projects formulated with support of CSB, for the states of Jharkhand (25000), Odisha (5220), and West Bengal (5000) covering 35,220 Mahila Kisans funded by MoRD(60%) and SRLMs (40%) with an outlay of Rs.63.34 crores, which are under implementation during the year. Besides, project proposals from the states of Chhattisgarh and Bihar are under consideration and proposal for Maharashtra is due for formulation.

C. SCHEDULED CASTE SUB-PLAN (SCSP)

During 2020-21, Ministry of Textiles, Govt. of India under Scheduled Caste Sub-Plan (SCSP) of Silk Samagra scheme released an amount of Rs. 41.25 crores to Karnataka, Andhra Pradesh, Telangana, Tamil Nadu, Bihar,

Uttarakhand, Punjab, Himachal Pradesh and Haryana towards implementation of components.

D. TRIBAL SUB-PLAN (TSP)

During 2020-21, Ministry of Textiles, Govt. of India under Tribal Sub-Plan (TSP) of Silk Samagra scheme released an amount of Rs. 16.50 crores to Karnataka, Andhra Pradesh, Telangana, Tamil Nadu, Odisha and Himachal Pradesh towards implementation of components.

E. SERICUTURE DEVELOPMENT IN NORTH-EASTERN STATES (NERTPS)

The North Eastern region of India being a non-traditional area for Sericulture, Govt .of India has given special emphasis for consolidation and expansion of Sericulture in all the North Eastern States with critical interventions from host plantation development to finished products with value addition at every stage of production chain. As a part of this, under NERTPS - an Umbrella scheme of Ministry of Textiles, the Govt. of India has approved 38 Sericulture projects implementing in all North Eastern States in the identified potential districts under four broad categories viz., Integrated Sericulture Development Project (ISDP), Intensive Bivoltine Sericulture Development Project (IBSDP), Eri Spun silk Mills (ESSM) and Aspirational Districts.

A total of 38 projects covering Mulberry, Eri and Muga silk are implemented in all NE States which includes 24 on-going and 14 new projects. Total cost of these projects is Rs.1,107.90 crore, of which GoI share is Rs.956.01 crore. Of which, 20 projects in ISDP including establishment of Seed Infrastructure in CSB units and Silk Processing & Printing unit in Tripura, 10 projects in IBSDP, 3 Projects for Eri Spun Silk Mills and 5 projects for Aspirational Districts. The Objective of these projects is to establish sericulture as viable commercial activity in NER by creating necessary infrastructure and imparting training skills to the locals for silkworm rearing and allied activities in the value chain. The projects are proposed to bring around 38,170 acres of plantation under mulberry, Eri, Muga & Oak Tasar sectors and expected to contribute additional production of 2,650 MT raw silk during the project period and generate employment around 3,00,000 persons.

a. **Integrated Sericulture Development Project (ISDP):** Eighteen projects have been approved with a total cost of Rs.631.97 crore **(**GoI share of Rs.525.11 crores**)** which includes 14 on-going and 4 new projects for implementation in Assam including BTC, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland and Tripura. This includes setting up of Soil to Silk for BTC (Assam) and Post Cocoon Technology for Nagaland**.** The projects will cover 29,910 acres of Mulberry, Eri & Muga plantation benefitting around 41,068 beneficiaries covering in all NE States. Till March 2021, Ministry has released Rs**.**457.20 crore for the above projects, against which the expenditure reported is Rs**.**389.98 crore **(**85**%).**

   Silk Printing Unit at Tripura: To modernize the Silk printing facilities for value addition to the silk and fabric produced in Tripura, a project for establishment of Silk Processing and Printing Unit under NERTPS was approved at a total cost of Rs.3.71 crore (100% Central assistance). This unit targets to print and process 1.50 lakh metre silk per annum. So far,

the Ministry has released Rs.3.71 crore for the purpose, against which expenditure has been reported for Rs.3.52 crore (95%).

Seed Infrastructure Units in CSB: To create infrastructure facilities for production of the quality seed in Mulberry, Eri and Muga Sectors in NE States, a project was approved at a total cost of Rs 37.71 crore (100% Central assistance). This scheme envisages construction of 6 seed infrastructure units [(1 mulberry seed unit at Jorhat (Assam), 4 muga seed units at Silchar (Assam), Kobulong. Mokoukchung (Nagaland), Kowbill, Kokrajhar (BTC-Assam), Tura (Meghalaya) and 1 Eri seed unit at Topatoli (Assam)] with a production capacity of 30 lakh mulberry Dfls and 21.51 lakh Muga & Eri Dfls]. Ministry has so far released Rs.37.71 crore for this project, against which the expenditure reported is Rs.35.46 crore (94%).

b. **Intensive Bivoltine Sericulture Development Project (IBSDP)**: Ten projects to produce for import substitute bivoltine silk with a total cost of Rs.290.31 crores out of which GoI share of Rs.258.74 crores which includes 8 on-going and 2 new projects have been sanctioned under NERTPS. The projects cover 4,900 acres of mulberry plantation benefitting around 10,607 women beneficiaries covering in all NE States (except Manipur). Upto March 2021, Ministry has released Rs.230.86 crore for the above project, against which the expenditure reported is Rs.198.51 crore (86%).

c. **Eri Spun Silk Mills (ESSM):** Establishment of 3 Eri Spun Silk Mills in Assam, BTC and Manipur States have been approved with a total cost of Rs.64.59 crore **(**GoI share of Rs.57.28 crores**)** to produce 165 MT of Eri spun silk yarn per annum benefitting around 7,500 stakeholders after establishment of mills. So for Ministry has released Rs.19.55 crore under the above said project.

d. **Development of Sericulture in Aspirational Districts (AD):** Govt. of India initiated development of silk industry in the Aspirational Districts in one/two blocks per district covering Mulberry, Eri, Muga or Oak Tasar as per the potentiality of the district with the involvement of State Governments. Presently 5 sericulture projects have been approved in the States of Assam, BTC, Mizoram, Meghalaya and Nagaland at a total cost of Rs.79.60 crore with GoI share of Rs.73.47 crore. The projects cover 3,360 acres of plantation benefitting around 4,245 beneficiaries. Till March 2021, Ministry has released Rs.52.86 crore under the above said project. Against which the expenditure reported is Rs.35.13 crore **(**66**%).**

Progress: Upto March, 2021, about 37,026 acres have been brought under host plantation of Mulberry, Eri , Muga and Oak Tasar covering 50,326 beneficiaries and produced 4,210 MT (P) of raw silk during the project period (2014-15 to 2020-21). As against Rs. 806.73 crore released by Ministry under the above projects, an expenditure of Rs.667.44 crore (83%)has been incurred contributing creation of about 50,000 assets at individual beneficiary level and at common facility level (Construction of rearing houses, seed grainages, reeling infrastructure, mounting halls, plantation etc.).

Some of major initiatives adopted for monitoring of the implementation of above projects are as follows:

- Geo-tagging of assets created under on-going sericulture projects have been undertaken through NESAC, Shillong. The assets of around 46,094 NERTPS beneficiaries are to be geo-tagged. The project activity is underway. For the 14 newly approved projects, in respect of plantation, the details of land and beneficiaries covered has been captured using GPS Map Camera App. Around 3000 geo-tagging of plantation and beneficiaries have been uploaded in CSB website.
- Third party evaluation of the projects with objective to review the degree of impact on the beneficiaries for evaluation of the current status of the projects in achieving the desired outcome and milestones under NERTPS projects has been completed by TERI, Bangalore, and submitted the final report on Evaluation study of NERTPS project to CSB.
- MIS have been developed under ISDP, IBSDP & Aspirational Districts. So far 86% of MIS have been uploaded under the project.
- As a part of monitoring & evaluation, field visits have been undertaken in the project sites by the scientists of CSB regularly. An Internal Assessment of the projects has been made on the progress of projects and DoSs has been requested to initiate action on the report.
- Combined meetings are being conducted at regular intervals with all NE States by CSB and MoT to review the progress of projects.

The summary of overall Sericulture projects being implemented under NERTPS is given in the Table below:

#	State	Total Project cost (Rs. Cr.)	GoI Share (Rs.Cr.)	GoI Release (Till March, 2021)	Beneficiaries (Nos)		Output per annum (MT) 2020-21 Achmt (P) (upto March-2021)
				(Rs. Cr.)	Target	Achmt	
I	**Integrated Sericulture Development Project**						
1	Assam	66.67	47.42	45.05	5,965	5,965	103.85
2	BTC	34.92	24.68	23.44	3,356	3,356	65.56
3	BTC (IEDPB)	11.41	10.61	10.08	654	654	26.66
4	BTC (Soil to Silk)	55.36	53.12	42.09	3,526	2,715	101.00
5	Arunachal Pradesh	18.42	18.42	17.50	1,805	1,391	8.40
6	Manipur (Valley)	149.76	126.60	116.83	6,613	6,257	68.95
7	Manipur (Hill)	30.39	24.67	20.50	2,169	1,548	39.14
8	Meghalaya	30.16	21.91	19.57	2,856	2,856	53.56
9	Mizoram	32.49	24.49	23.26	1,683	1,683	11.61
10	Mizoram (IMSDP)	13.52	12.83	12.19	833	800	0.30
11	Nagaland	31.47	22.66	21.52	2,678	2,678	21.03
12	Nagaland (IESDP)	13.66	12.83	12.19	1,053	1,053	16.70
13	Nagaland (PCT)	8.57	8.48	8.06	406	406	Post cocoon & post yarn activities are in progress
14	Tripura	47.95	33.20	30.03	3,432	3,432	89.20
	Total (I)	**544.75**	**441.93**	**402.30**	**37,029**	**34,794**	**605.96**
Ia	**New ISDP projects**						
15	Ar. Pradesh (ILSEF)	37.25	35.65	15.82	1,270	1185	27.00
16	Ar, Pradesh (IMSDP)	12.69	12.15	9.62	875	350	1.80

17	BTC –IESDP (Tap)	18.63	17.35	14.74	1,400	1040	9.09
18	Nagaland-Chungtia	18.67	18.04	14.72	500	406	1.00
	Total (Ia)	**87.24**	**83.19**	**54.90**	**4,045**	**2,884**	**38.89**
	Sub Total	**631.97**	**525.11**	**457.20**	**41,074**	**37,678**	**644.85**
Ib	**Infrastructure Projects**						
19	Tripura (Silk Printing)	3.71	3.71	3.71	-	-	Printed 1247 Sarees
20	CSB Seed Infrastructure	37.71	37.71	37.71	-	-	0.04 lakhs Mulberry dfls, 0.80 lakhs Muga dfls & 0.10 lakhs Eri dfls achieved
	Total (Ib)	**41.42**	**41.42**	**41.42**	**-**	**-**	**-**
	Total (I+Ia+Ib)	**673.39**	**566.53**	**498.62**	**41,074**	**37,678**	**644.85**
II	**Intensive Bivoltine Sericulture Development Project**						
1	Assam	29.55	26.28	24.96	1,144	1,144	3.50
2	BTC	30.06	26.75	25.41	1,188	1,188	2.25
3	Arunachal Pradesh	29.47	26.20	24.89	1,144	663	1.40
4	Meghalaya	29.01	25.77	24.47	1,044	1,033	12.45
5	Mizoram	30.15	26.88	25.54	1,169	1,169	8.07
6	Nagaland	29.43	26.16	24.85	1,144	1,144	4.26
7	Sikkim	29.68	26.43	25.11	1,094	988	0.08
8	Tripura	29.43	25.95	24.65	1,144	1,144	23.10
	Total (II)	**236.78**	**210.41**	**199.88**	**9,071**	**8,473**	**55.11**
IIa	**New Bivoltine projects**						
9	Nagaland–Biv (SPV)	22.43	20.68	18.61	436	406	1.31
10	Tripura-Sepahijala	31.11	27.64	12.37	1,100	500	-
	Total (IIa)	**53.53**	**48.32**	**30.98**	**1,536**	**906**	**1.31**
	Total (II+IIa)	**290.31**	**258.74**	**213.38**	**10,607**	**9,379**	**56.42**
	IEC			**4.84**			
III	**Eri Spun Silk Mills***						
1	Assam	21.53	19.09	5.00	2500	-	-
2	BTC	21.53	19.09	9.55	2500	-	-
3	Manipur	21.53	19.09	5.00	2500	-	-
	Total(III)	**64.59**	**57.28**	**19.55**	**7500**	**-**	**-**
IV	**Aspirational Districts**						
1	Assam	21.03	19.55	9.78	1,200	566	-
2	BTC	20.28	18.64	15.81	1,020	750	16.16
3	Meghalaya	12.08	10.97	5.48	410	430	-
4	Mizoram	11.56	10.82	9.74	650	559	2.91
5	Nagaland	14.65	13.49	12.05	965	964	14.50
	Total(IV)	**79.60**	**73.47**	**52.86**	**4,245**	**3,269**	**33.57**
Grand Total (I+II+III+IV) (38 projects)		**1,107.90**	**956.01**	**806.73**	**63,426**	**50,326**	**734.84**

(P): provisional, **Note: *** 7,500 beneficiaries will be benefitted indirectly on establishment of Eri spun silk mills at Assam, BTC and Manipur

SUCCESS STORIES IN SERICULTURE:

1. Shri B. Chidananda, Agali, Madakasira, Ananthapuram district, Andhra Pradesh studied up to 10th class, having 4.0 acres of land got into sericulture farming in 1984 due to high production cost and low income from sugarcane, paddy, maize and areca nut cultivation. He practised 5 crop schedule/year with brushing of 300 dfls/acre/crop and harvested an average cocoon yield of 75-80 kg/100 dfls. By practising bivoltine sericulture, his annual income increased from Rs.1 lakh to Rs. 12.60 lakhs per anum. The earnings from sericulture helped him to arrange education, marriage and individual houses to his siblings. After adopting sericulture, the farmer and his family became self-sufficient, improved their socio-economic status and are leading a secured life.
2. Shri Francis Xavier Amalraj, Malamettukkadu, Kozhippara PO, Elappully, Palakkad district, Kerala is a stakeholder of sericulture since 2008. He initiated mulberry in one acre and constructed a silkworm rearing shed by spending Rs. 2 lakhs with the support and guidance of CSB. He has increased the mulberry acreage to 2.5 acres during 2018-19. Presently he is rearing 1,500 dfls annually in 10 or 11 crops. His average cocoon yield is above 90 kgs per 100 dfls. The revenue generated from sericulture helped him to construct a new dwelling house at the cost of Rs.10 lakhs, purchase of new motor cycle, farm mechanization equipments like mini power tiller, weed cutter, power sprayer, *etc*. and to provide good education to his children.
3. Shri Amelson Sangma, East Garo Hills, Meghalaya is practising raising of Kissan Nurseries of Eri Host plant, Kesseru, since 2014-15, with financial support under NERTPS for this self-employment venture**.** He is supplying about 20,000 saplings of Kesseru varieties and getting an average income of Rs**.**1,60,000/Year. He has supported farmers in this hilly terrain areas of Tura in East Garo Hills by supply of healthy saplings to raise plantations under the project.
4. Shri Sayed Azam, Chikkaballapur, Karnataka with 8th Standard pass, is engaged in mulberry silk Reeling since last 30 Years. During 2016-17, He installed a 400 ends Automatic Reeling Machine with GOI support (50%), State Govt support (25%) and remaining as his contribution. Required technology support was extended from CSB. He is able to reel 700 Kg of cocoons per day, producing an average of 112 kg of raw silk and getting an average annual income of Rs.10 lakh. With the support, He has cleared his loan of Rs.75Lakh, and purchased a Four Wheeler.

POLICY INITIATIVES

1. Customs Duty on imports: The basic customs Duty on Raw Silk has been enhanced from the level of **10% to 15%** on 1st Feb-2021. The basic customs duty on Silk fabric is maintained at 20 %.

B. STATUS OF SILK INDUSTRY

Silk is the most elegant textile in the world with unparalleled grandeur, natural sheen, and inherent affinity for dyes, high absorbance, light weight, soft touch and high in durability. Because of these unique features silk is known as the

"Queen of Textiles" the world over. On the other hand, it stands for livelihood opportunity for millions, owing to its high employment potential, low capital requirement and remunerative nature of its production. The very nature of this industry with its rural based on-farm and off-farm activities and enormous employment generation potential has attracted the attention of the planners and policy makers to recognize the industry among one of the most appropriate avenues for socio-economic development of a largely agrarian economy of India.

Silk has been intermingled with the life and culture of the Indians. India has a rich and complex history in silk production and its silk trade which dates back to 15th century. Sericulture industry provides employment to approximately 9.40 million persons in rural and semi-urban areas in India. Of these, a sizeable number of workers belong to the economically weaker sections of society, including women. India's traditional and culture bound domestic market and an amazing diversity of silk garments that reflect geographic specificity has helped the country to achieve a leading position in silk industry. India has the unique distinction of being the only country producing all the five known commercial silks, namely, Mulberry, Tropical Tasar, Oak Tasar, Eri and Muga, of which Muga which is produced only in India with its golden yellow glitter is a prerogative of India.

India is the second largest producer of silk in the world. Among the four varieties of silk produced in 2020-21, Mulberry accounted for 70.72% (23,860 MT), Tasar 8.02% (2,705 MT), Eri 20.55% (6,935 MT) and Muga 0.71% (239 MT) of the total raw silk production of 33,739 MT (Provisional).

Performance of Sericulture Sector

Particulars	2015-16 Achmnt	2016-17 Achmnt	2017-18 Achmnt	2018-19 Achmnt	2019-20 Achmnt	2020-21	
						Target	Achmnt (P)
Mulberry Plantation (Lakh ha.)	2.09	2.17	2.24	2.35	2.39	2.54	2.38
Raw Silk Production (MT)							
Mulberry (Bivoltine)	4613	5266	5874	6987	7009	8375	6772
Mulberry (Cross breed)	15865	16007	16192	18358	18230	19125	17088
Sub Total (**Mulberry**)	**20478**	**21273**	**22066**	**25345**	**25239**	**27500**	**23860**
Vanya							
Tasar	2819	3268	2988	2981	3136	3740	2705
Eri	5060	5637	6661	6910	7204	7500	6935
Muga	166	170	192	233	241	260	239
Sub Total (**Vanya**)	**8045**	**9075**	**9840**	**10124**	**10581**	**11500**	**9879**
GRAND TOTAL	**28523**	**30348**	**31906**	**35468**	**35820**	**39000**	**33739**

Source: Compiled at CSB from the data received from DOSs , (P): Provisional

Raw Silk Production during 2020-21

The silk production has been reduced in the country during 2020-21 due to the disruptions caused by the Covid-19 pandemic. The total raw silk production in the country during 2020-21 was 33,739 MT, which was 5.8% lesser than the production achieved during the previous year 2019-20 and

registered around 86.5% of achievement against the annual silk production target for the year 2020-21.

The bivoltine raw silk production declined by 3.4% to 6,772 MT during 2020-21 from 7,009 MT during 2019-20. Similarly, vanya silk, which includes Tasar, Eri and Muga silks, have reduced by 13.8%, 3.7% and 0.8%, respectively during 2020-21 over 2019-20.

The area under mulberry has reduced by 0.8% in 2020-21 compared to previous year. The State-wise production of raw silk during 2017-18 to 2020-21 are given in **Annexure- I.**

Raw Silk Imports:

The quantity and value of raw silk imported during 2017-18 to 2020-21 are given below:

Year	Quantity (MT)	Value (Rs. in Crores)
2017-18	3712	1218.14
2018-19	2785	1041.35
2019-20	3315	1149.32
2020-21 (P)	1804	570.56

Source : DGCIS, Kolkata, **P** : provisional

Exports:

The export earnings during 2020-21 were Rs. 1418.97 crores. Export values of silk goods during 2017-18 to 2020-21 are given below:

(Rs. in Crores)

Items	2017-18	2018-19	2019-20	2020-21(P)
Natural Silk Yarn	15.66	24.72	16.77	7.90
Silk Fabrics and made-ups	864.81	1022.43	982.91	406.95
Readymade Garments	650.48	742.27	504.23	679.31
Silk Carpet	17.34	113.08	143.43	174.20
Silk Waste	101.19	129.38	98.31	150.61
Total	**1649.48**	**2031.88**	**1745.65**	**1418.97**

Source: *Compiled from the Statistics of DGCIS, Kolkata;* **P:** Provisional

Employment Generation:

The estimated employment generation under sericulture in the country was 8.7 million persons during 2020-21 compared to 9.4 million persons in 2019-20, indicating a reduction of 7.4%.

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Annexure- I

State-wise raw silk production during the Last 4 Years (2017-18 to 2020-21)

(in MT)

#	State	2017-18		2018-19		2019-20		2020-21	
		Target	Achmnt.	Target	Achmnt.	Target	Achmnt.	Target	Achmnt. (P)
1	Karnataka	11120	9322	10750	11592	12000	11143	12600	11292
2	Andhra Pradesh	6090	6778	7805	7481	7946	7962	8208	8422
3	Telangana	160	163	200	224	295	297	310	309
4	Tamil Nadu	2000	1984	2190	2072	2300	2154	2300	1834
5	Kerala	12	15	14	16	20	13	17	5
6	Maharashtra	328	373	415	519	630	428	475	428
7	Uttar Pradesh	300	292	340	289	365	309	354	316
8	Madhya Pradesh	230	103	160	100	165	61	80	47
9	Chhattisgarh	405	532	670	349	562	480	535	300
10	West Bengal	2590	2577	2775	2394	2900	2295	2520	872
11	Bihar	85	63	95	55	86	56	58	58
12	Jharkhand	2744	2220	2658	2375	2604	2402	2904	2185
13	Odisha	140	116	148	131	150	137	160	117
14	Jammu & Kashmir	180	132	190	118	170	117	142	80
15	Himachal Pradesh	40	32	43	34	50	31	45	20
16	Uttarakhand	44	35	45	36	42	40	25	25
17	Haryana	2	0.7	2	0.7	2	1	1	1
18	Punjab	6	3	5	3	5	3	4.5	1
19	Assam	4705	4861	4980	5026	5395	5316	5519	5450
20	Ar. Pradesh	58	54	65	59	75	64	67	43
21	Manipur	560	388	435	464	600	504	542	327
22	Meghalaya	1070	1076	1110	1187	1220	1192	1245	1213
23	Mizoram	100	83.6	105	92	130	104	113	43
24	Nagaland	770	615	633	620	682	600	649	264
25	Sikkim	17	0.001	3	0.4	1	1	2	0.08
26	Tripura	85	87	125	230	130	111	125	86
Total		**33840**	**31906**	**35960**	**35468**	**38530**	**35820**	**39000**	**33739**

(p): Provisional