

वार्षिक प्रतिवेदन
Annual Report
2010-11



केन्द्रीय रेशम बोर्ड

वस्त्र मंत्रालय - भारत सरकार
केरेबो काम्प्लेक्स, बी टी एम लेआउट, मडिवाला
बेंगलूरु - 560 068, भारत

CENTRAL SILK BOARD

Ministry of Textiles - Govt. of India
CSB Complex, BTM Layout, Madiwala
Bangalore - 560 068, INDIA



अक्टूबर 2011

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**HIGHLIGHTS OF CENTRAL SILK
BOARD'S ACTIVITIES 2010-11**

Introduction

The year 2010-11 has been a good year for Silk Industry in India. During the year 2010-11, total production of all varieties of raw silk was 20,410 M.T. compared to the production of 19,690 M.T. in the year 2009-10, indicating an increase of 3.7%. The mulberry production of bivoltine silk and Vanya silks has shown a remarkable growth. The employment has increased from 6.8 Million persons during 2009-10 to 7.25 Million persons during 2010-11 registering a growth of 6.35%. Comparative performance of silk industry during the years 2009-10 and 2010-11 is given below:

Unit: Raw Silk, Metric Tonnes

Sl. No.	Variety	Achievement		Incr./Decr over 2009-10(%)
		2010-11	2009-10	
I	Mulberry Plantation (Lakh ha)	1.70	1.84	-7.3
II	Mulberry Raw Silk			
	Bivoltine	1,400	1,200	16.7
	Cross Breed	14,960	15,122	-1.1
	Mulberry Total	16,360	16,322	0.2
III	Vanya Silk			
	Tasar*	1,166	803	45.2
	Eri	2,760	2,460	12.2
	Muga	124	105	18.1
	Vanya Total	4,050	3,368	20.2
	Grand Total	20,410	19,690	3.7
IV	Productivity (Silk production/ha) in Kg	96.06	88.12	9
V	Employment (L.Persons)	72.50	68.17	6.35

* includes both Tropical and Oak-Tasar

The table below indicates the performance of silk industry during IX, X and XI Plan periods. The silk production has shown a steady growth over the years in spite of drastic reduction in the area due various constraints like drought, labour scarcity, urbanization, drastic fall in cocoon price etc. Therefore, the increase in silk production in the country is due to improvement in productivity leading to vertical growth of the industry due to R&D intervention and implementation of centrally sponsored Catalytic Development Programme resulting in technology absorption. The industry has now taken a momentum of growth which is likely to be continued in the coming years.

Sl. No.	Particulars	IX Plan Ach	X Plan Ach	XI Plan Achievement			
				2007-08	2008-09	2009-10	2010-11
I	Mulberry Area (L.ha.)	2.32	1.92	1.85	1.78	1.84	1.70
II	Production of Raw Silk (in M.T.)						
a	Mulberry	15,842	16,525	16,245	15,610	16,322	16,360
b	Vanya Silk	1,509	1,950	2,075	2,760	3,368	4,050
	Grand Total	17,351	18,475	18,320	18,370	19,690	20,410

● Major achievements in Research and Development

The main Research & Training Institute of the CSB provide R&D and Training support for the development of sericulture. The Central Sericultural Research and Training Institutes at Mysore (Karnataka), Berhampore (West Bengal) and Pampore (J&K) deals with mulberry sericulture. The Central Tasar Research & Training Institute at Ranchi (Jharkhand) deals with Tasar culture. The Central Muga Eri Research & Training Institute established at Lahdoigarh, Jorhat (Assam) deals with Muga and Ericulture. These Research Institutes have a network of Regional Sericulture Research Stations (RSRS / RTRS) and Research Extension Centres for mulberry and vanya sericulture for the dissemination of research findings and for tackling the regional field issues of the industry. In order to provide R&D support in post-cocoon sector, the Board has established a Central Silk Technological Research Institute (CSTRI) at Bangalore. In addition, the CSB has also set up specialized Research Institutes such as Silkworm Seed Technology Laboratory, (SSTL) in Bangalore (Karnataka), Central Sericultural Germplasm Resource Centre (CSGRC) at Hosur (Tamil Nadu) and Seri-Biotech Research Laboratory (SBRL) at Bangalore. During 2010-11, 48 research projects are continued and 18 new research projects were initiated and a total 45 research projects were concluded. The brief highlights of the Research and Development activities of CSB research institutes during the period under report are as follows:

Mulberry

Identified two genotypes - Gen.3 and Gen.8 superior over check variety (RC-1 and V-1) under sub-optimal and optimal conditions of irrigation by 16-28%. Identified one triploid each, out-yielding both the National check [S1635] by 17% and the respective regional checks [S13 / V-1], under soil moisture stress and non-stress conditions by 19% and 37.5%, respectively. Eleven lines of transgenic

mulberry with HVA1 gene was subjected to hardening and multiplied. Under the development of mulberry transgenic plants, leaf explants tissue of V-1 genotype were co-cultivated with the *Agrobacterium* (EHA105) strain harbouring the binary construct (pB1121) carrying (i) *SHN1* and *DREB2A* genes under 35 S promoter and (ii) *DREB 2A* and *SHN 1* genes under Rd 29A and Cer 6 promoters, respectively. Five promising mulberry varieties were evaluated to find out the importance of different treatments viz., organic nutrients, combined effect of organic and inorganic nutrients. For identification of QTLs conferring resistance to mulberry root rot disease, three bacteria and 4 fungi were isolated and purified by streak/ mono hyphal tip methods. The bacterial isolates were found non-pathogenic. Fungal isolate, *Rhizoctonia bataticola* (= *Macrophomina phaseolina*) was found pathogenic. The other isolates, *F. solani*, *F. oxysporum* and *B. theobromae* were found to cause secondary infection on roots. Three exotic parasitoids of Papaya mealy bug viz, *Anagyrus loecki*, *Acerophagus papayae* & *Pseudleptomastix mexicana* were imported from USDA and a classical biological control for management of Papaya mealy bug was developed. A total of 15,100 adults of *Acerophagus papayae* parasitoids under classical biological control programme were released in papaya mealy bug infested mulberry gardens of 25 farmers in Tamil Nadu and 34 farmers in Karnataka. After the release of parasitoids, the infestation reduced from 80% to less than 2% resulting in more than 90% suppression. Since 5 years, continuous release of lady bird beetles in 70 acres of mulberry garden & *N. thymus* in rearing houses at CSRTI, Mysore was able to keep the incidence of tukra & uzi fly below 5% level without the application of any chemical/insecticide.

Under West Bengal condition, application of vermicompost @ 30 mt/ha/year recorded leaf yield

of 42.25 mt/ha/yr against 40.35 mt/ha/yr in control with an increase of 4.7% leaf yield. Ten new mulberry varieties developed through hybridization were identified as higher leaf yielder (1.19 kg to 1.69 kg/ plant) with a gain of 12.2 to 59.1% over the S-1635 (1.06 kg/plant) under low productive soil condition (at Primary Yield, Trial). Leaf harvesting and pruning technology for mulberry trees grown under sub-tropical conditions of North India has revealed that the commercialization of second crop under sub-tropics has picked up through adoption of developed technology resulting thereby in an average cocoon yield of about 30 kg/100 DFLs, as against less than 10 kg / 100 DFLs recorded earlier. CSRTI, Pampore maintains 58 mulberry accessions at Pampore. 80 accessions of mulberry are being maintained at P4 BSF, Manasbal as Temperate Germplasm Bank. 168 silkworm races are being maintained as Silkworm Germplasm Bank at CSRTI, Pampore (mostly bivoltines). A working germplasm of 44 silkworm accessions are being maintained at RSRS, Sahaspur. 58 silkworm genotypes as Silkworm Germplasm Bank, are maintained at RSRS, Jammu. Survey and exploration was conducted in Punjab and Haryana during November, 2010 and 18 mulberry germplasm were collected raising the number of collections through survey to 744; also 30 mulberry germplasm materials were collected from KSSRDI, Bangalore. 44 mulberry germplasm accessions were added in the field gene bank raising the total accessions to 1180 of which 910 are indigenous and 270 are exotic. 20 mulberry accessions were characterized for 14 morphological and anatomical parameters; thus 1065 accessions are so far characterized from the field gene bank. 55 mulberry accessions were evaluated for propagation traits.

Nine productive breeds (CSR2, CSR3, CSR4, CSR6, CSR12, CSR16, CSR17, CSR26 and CSR27) and thirteen robust breeds (CSR18,

CSR19, CSR46, CSR47, CSR50, CSR51, CSR52, CSR53, D2, D20, NB1, S8 and S9) were reared following the race maintenance procedures. The performance of the breeds were in conformity with the original breed characteristics. To study the performance of double hybrid (CSR50 x CSR52) x (CSR53 x CSR51), the parental breeds viz., CSR50, CSR52 (oval), CSR53, CSR51 (dumbbell) and the foundation crosses namely CSR50 x CSR52 (oval FC) and CSR53 x CSR51 (dumbbell FC) were evaluated. Ten breeding plans were initiated and 16 lines were identified. Mid-way hybrid evaluation was conducted at F10 generation, 10 lines were short-listed. After hybrid evaluation only 6 lines were retained and continued. Twenty-one bivoltine and twelve multivoltine artificial diet breeds are being maintained as breeders stock for original breed characters. Four trials of muga diet rearing were conducted at CMERTI, Jorhat and two trials of mulberry at CSRTI, Mysore. 87.26% average feed response was recorded. 85.75% larvae successfully passed second moult.

Under West Bengal condition, rearing was conducted with three productive and hardy Multi x Bi hybrids namely M6D(P)C x SK4(C), M6D(P)C x [D6(P)N x SK4(C)] and M6D(P)C x D6(P)N and one bivoltine hybrid D6(P)N x SK4(C) under multi-locational trial showed an yield of 56.3 kg, 56.8 kg and 54.9 kg/100 dfls, respectively, in Multi x Bi against 48.3 kg/100 dfls in control (NxNB4D2), while in Bi x Bi, cocoon yield was 43.9 kg /100 dfls against 38.3 kg/100 dfls in control (NB18 x P5). In Jammu and Kashmir, under the project improvement of silkworm *Bombyx mori*, 10 breeding populations for isolation of breeds for sub-optimal conditions have completed F8 generation. The breeding populations SO-4, SO-12 and SO-20 have recorded >94% pupation with 21.84%, 22.16% and 21.57 shell %, respectively. Under isolation of thin denier lines, six breeding populations completed F5 generation in autumn,

2010. The denier in these lines was recorded in the range of 2.00 to 2.40. Two productive silkworm hybrids, SBGP22 X SBGP5 and CSR2 X SBGP22 evolved by the Institute have completed trials under Provincial Race Authorization Programme. Under maintenance programme, 9 bivoltine races viz, SH6, NB4D2, CSR2, CSR4, SBGP5, SBGP20, SBGP22, DUN6, and DUN22 are being maintained under breeders / parental stock. Germplasm Resources Centre holds 443 silkworm genetic resources comprising of 73 multivoltine, 350 bivoltine and 20 mutant accessions in Gene Bank. The accessions were conserved true to type with package of conservation management procedures developed by the centre. The long-term preservation technique developed for cross breed eggs (PM x CSR2) has been utilised for commercial purpose. A quantity of 10.76 lakh of CB eggs produced at 8 Silkworm Seed Production Centres of National Silkworm Seed Organization were preserved and distributed to the farmers. The bioassay of three parental transgenic races has shown enhanced tolerance to NPV. The expression patterns of genes at different time intervals has been studied. Immune responses elicited due to infestation by dipteran parasite, *Exorista bombycis* (uzi fly) on the silkworms, *Bombyx mori* and *Samia cynthia ricini* have been analyzed. Seven different microsporidians were identified, out of which three were from the mulberry silkworms and the remaining were from the different mulberry insect pests. The studies on spore morphology, pathogenicity, cross infection, mode of transmission and life cycle (for three microsporidians) and cross infectivity to silkworm was carried out.

Vanya Silk

Plus trees of *T.arjuna* and *T.tomentosa* have been identified for multiplication. Based upon various morphological, biochemical, anatomical and molecular studies for characterization and subsequently bioassay trials, three accessions of *T. arjuna* and one accession of *T. tomentosa* have been finally selected as superior ones for further multiplication. Protocol has been developed for *in*

vitro multiplication of *Terminalia* sp in WPM MMS medium supplemented with various concentrations of BAP (0.5, 1.0, 1.5, 2.0 and 2.5 mg/L) + NAA. For development of chawki garden under two crop system, pruning of *T.arjuna* at 3' height, fertilizer dose of 100:50:50 NPK/ha/yr (50:50:50 kg NPK/ha during first crop and 50 kg N/ha during second crop) along with 2 kg manure/plant/crop has been found as a better proposition. Combination (SM5) of secondary nutrients viz., Mg, Ca & S under field trial was found to improve the leaf yield of tasar host plant by 27.45% and leaf quality (Leaf moisture – 4.96%, total minerals -11.83%, crude protein-16.45% and total carbohydrates-11.66%) over control.

New Germplasm bank of muga host plant was established. Approximately, 39 som accessions of plus tree and three genotypes viz., PT-27, PT-11 and PT-16 som plus trees have been found superior in terms of growth characters, leaf yield, disease resistance & rearing performances. Acc 003 and Acc 004 have been evaluated as superior genotypes of castor for eri silkworm rearing out of eight castor genotypes. Acc 03 and Acc 04 showed higher leaf yield of 13.79 and 13.38 MT leaf yield/ha/year, respectively. Attempts were made to isolate, identify and characterize insect stimulants released from muga silkworm host plants and study its functional properties. Chlorogenic acid, Phenyle Alanine Ammonia Lyase (PAL) activity and Trypsin inhibiting activity were analysed from medium, tender and mature leaves of food plants. Its effect on the feeding efficiency of muga silkworm was studied.

In eri sector there is only one evaluated variety of castor, NBR-1. To evaluate more suitable castor genotype for eri silkworm, superior genotypes of castor for eri silkworm rearing was evaluated. During the year, two more accessions of castor Acc 003 and Acc 004 have been evaluated as superior genotypes for eri silkworm rearing out of eight castor genotypes. Acc 003 and Acc 004 showed higher leaf yield of 13.79 and 13.38 MT leaf yield/ha/year, respectively.

Presence of seventeen diapause specific Expressed Sequence Tags (ESTs) was identified during different phases of diapause. On their presence, diapause termination was found to start when pupae were 195 days old. Twenty seven isolates of disease causing pathogens (microsporidia-10 and bacteria -17) are registered with the NCBI as specific to *A. mylitta*. A total of 2345 ampoules of Leaf Surface Microbe formulation (LSM) were produced and supplied to CSB/DOS units of different tasar growing states for control of Virosis of silkworm. Average increase in cocoon yield by 12 per dfl was recorded in LSM sprayed lots. Trials conducted on the effect of Jeevan Sudha (botanical formulation against Virosis) with 600 farmers covering 1.20 lakh dfls in Jharkhand indicated reduction of virosis by 37% and improvement in cocoon yield by 11 per dfl. Method has been developed for laboratory culture of Stem borer, *Aelosthes holosericea* for development of control measures.

Seven accessions of muga silkworm collected from different pockets of North- Eastern Region are being maintained in *ex situ* condition. Muga silkworm hybrids were produced and evaluated. Endocrine control of vitellogenin synthesis during reproductive cycle & ovarian development was studied. Hormonal control of cerebral neurosecretion during reproduction was reported. Effect of exogenous application of hormone to enhance fecundity was studied in detail. For domestication of muga silkworm an attempt was made to standardize rearing of muga silkworm using semi-synthetic diets. It is successful upto 3rd instar. Muga silkworm responded to semi-synthetic diet and 86.95% survivability was observed after 48 hours of hatching. Rearing of muga silkworm in unfavourable season is the bottleneck of the growth of the industry. Long time preservation schedule of muga silkworm to skip hazardous season was developed. Effect of preservation of muga seed cocoons on fecundity and hatching was studied and found that preservation upto 62

days (during Jarua crop) and 42 days (during Aherua crop) did not affect the fecundity and hatching against control.

Post-cocoon Technologies

Eight-end-Multi-end Reeling machine has been designed and developed. Impact of high humidity during cocoon spinning on colour, sericin chemistry and exfoliation was also investigated. It was found that high humidity influences the colour and sericin characteristics but not the exfoliation in raw silk. A low cost solar operated spinning machine was developed to improve the quality of hand spun yarn, reduce production cost and drudgery and to make it suitable for physically handicapped / aged persons. A special brush was developed for brushing tasar/muga cocoons before wet reeling. This eliminates the de-flossing process, saves time and reduces wastage. Trials conducted on improving the dimensional stability of Tasar silk fabrics showed that it was possible to reduce fabric shrinkage by upto 8% without affecting strength and some other properties. The study of pilling resistance of Eri silk knits revealed that the Eri knits from dyed yarn exhibit better pilling resistance than the knits made from un-dyed yarn. Low cost electronic jacquard for handlooms has been successfully developed at the Institute and the same has been demonstrated to the handloom weavers. Wet reeling machine having 30 ends / five basins for tropical and temperate tasar cocoons has been developed. It has a capacity to reel 4000 cocoons and it can produce 3.5 kg/day of reeled yarn. Cocoon cooking recipe for wet reeling of tropical and temperate tasar cocoons was developed. The yarn produced has good lusture, adhesive and test result showed upto 3.10 g/d tenacity. The untwisted wet reeled yarn can be directly used as a warp or weft for manufacturing fine tasar silk fabrics or with other fibres. A pedal free solar energy operated spinning machine has been developed for reeling and spinning of tasar silk. It produces 280 to 300 g of raw silk per day.

Patent & Commercialization

Patent filed

1. A diet for rearing young instar muga silkworm and a process for preparation there of (JPR/4.11.13/10055/2010)
2. Development of sericin extraction process from sericin rich bivoltine silkworm hybrid cocoon shell (Pat/4.4.4/09103/2010)
3. Navinya – A bio-formulation for control of mulberry root rot disease (IPR/4.25.14.10079)

Patents obtained

Semi synthetic diet for rearing of young instar tropical tasar silkworm, *Antheraea mylitta* (Pat.No.240259/30.4.2010)

- **Policy Intervention during 2010-11**
 - *Inclusion of Sericulture under RKVY* : The Ministry of Agriculture, Govt. of India vide its Notification No.3-22/2010-RKVY, dated 11-6-2010 has included Sericulture as one of the activities under Agriculture & allied sectors under RKVY Scheme, introduced by the Govt. of India during the XI Plan, as an additional Central Assistance Scheme. This has helped the sericulture sector to tap resources from Agriculture Ministry for the development of sericulture.
 - *Reduction in customs duty* - Customs duty on import of silk has been reduced from 30% to 5% as a short term measure to control the steep hike in the prices of silk commodities.
 - *Anti-dumping duty on Silk fabric*: The anti-dumping duty imposed on Chinese silk fabric has been in force for a period of 5 years till May 2011. Considering the request of the domestic powerloom silk weaving industry to protect them from the import of silk fabric from China at low rates, a sunset review application for continued imposition of anti-dumping duty for another term of 5 years

has been filed during September, 2010. The Directorate General of Anti-dumping & Allied Duties (DGAD) has issued Gazette Initiation Notification on 6th December 2010 to investigate the case. Meanwhile the authority has extended the existing anti-dumping duty on silk fabric till 5th December 2011.

- **Parliament Related Matters**

During the year 2010-11 CSB furnished reply material for 99 Parliamentary Questions as per the break-up given below :

Sl.No.	House of Parliament	Total
1	Lok Sabha	64
2	Rajya Sabha	35
Total		99

- **Right to Information Act, 2005**

CSB has designated 37 CPIOs and 215 APIOs in its headquarters and Field units to provide information to the public. CSB has updated 17 Manuals/Reports and published the same in the CSB Website (www.csb.gov.in) as per the provisions of the Act. A Public Information Cell has been established in the Head quarters of CSB to receive enquiries from the Public and to furnish replies. The Cell is integrated to Kisan Call Centre (1551). CSB received 152 applications seeking information under Right to Information Act and all have been replied within the prescribed time-limit.

- **Official Language**

Central Silk Board, Bangalore bagged second prize of Indira Gandhi Rajbhasha Puraskar for excellent performance in implementation of Official Language Policy for the year, 2008-09 conferred by the Department of Official Language, Ministry of Home Affairs, Govt. of India, New Delhi. The Member Secretary Smt. M. Sathiyavathy, Central Silk Board, Bangalore received the award from His Excellency Vice-President Md. Hamid Ansari on 14th September, 2010.



FUNCTIONS AND ORGANISATIONAL SET-UP

• Introduction

The Central Silk Board (CSB) is a Statutory Body, established on 20.09.1948, by an Act of Parliament. It functions under the administrative control of the Ministry of Textiles, Government of India.

The main functions assigned to the Board under the Act are:

- Promoting the development of Silk Industry by such measures as it thinks fit.
- Undertaking, assisting and encouraging scientific, technological and economic research.
- Devising means for improved methods of mulberry cultivation, silkworm rearing, developing and distribution of healthy silkworm seeds, improved methods of silk reeling and spinning of the cocoons and silk-waste, improving the quality and production of raw silk, if necessary by making it compulsory for all raw silk to be marketed

only after the same has been tested and graded in properly equipped raw Silk Testing and Conditioning Houses.

- Improving the marketing of raw silk.
- The collection of statistics.
- To advise the Central Government on all matters relating to the development of silk industry including import and export of raw silk.
- To prepare and furnish such other reports relating to the silk industry as may be required by the Central Government from time to time.

• Constitution of the Board

In exercise of powers conferred by Sub-Section 3 of Section 4 of the CSB Act 1948, the following Members have been appointed to serve as Members of CSB for a period of 3 years as per the provisions of the Act as shown against their names:

Sl. No.	Name of the nominated Member and period	Period of Nomination	Notification No. & date	Nominated under Section
1	Shri M. Manoharan, Chennai	16.08.2010 to 15.08.2013	25012/56/99-Silk dated 16.08.2010	4(3)(j)
2	Shri A. Manivelan, Chennai	16.08.2010 to 15.08.2013	25012/56/99-Silk dated 16.08.2010	4(3)(j)
3	Shri G. Egappan, Chennai	16.08.2010 to 15.08.2013	25012/56/99-Silk dated 16.08.2010	4(3)(j)
4	Shri T.V. Satheesh Kumar, Chennai	16.08.2010 to 15.08.2013	25012/56/99-Silk dated 16.08.2010	4(3)(j)
5	Shri Ma.Pa. Anbu, Chennai	16.08.2010 to 15.08.2013	25012/56/99-Silk dated 16.08.2010	4(3)(j)
6	Shri ARPM Kamraj, Chennai	16.08.2010 to 15.08.2013	25012/56/99-Silk dated 16.08.2010	4(3)(j)
7	Shri S. Madan Mohan, Chennai	16.08.2010 to 15.08.2013	25012/56/99-Silk dated 16.08.2010	4(3)(j)
8	Shri N. Ramalingam, Chennai	16.08.2010 to 15.08.2013	25012/56/99-Silk dated 16.08.2010	4(3)(j)
9	Shri Dhiraj Pasad Sahu, MP, Rajya Sabha, New Delhi	18.08.2010 to 17.08.2013	25012/1/08-Silk dated 18.08.2010	4(3)(c)
10	Ms. Shamsher Kaur, Chief Controller of Accounts, Ministry of Textiles, Govt. of India, New Delhi	25.03.2011 to 24.03.2014	25012/56/99-Silk dated 25.03.2011	4(3)(b)
11	Shri R. Rajagopal, IAS, Principal Secretary to Govt. of Handlooms, Handicrafts, Textiles & Khadi Deptt., Govt. of Tamil Nadu.	25.03.2011 to 24.03.2014	25012/56/99-Silk dated 25.03.2011	4(3)(e)
12	Shri Udai Narayan Thakur, IAS, Director, Handloom & Sericulture, Deptt. of Industries, Govt. of Bihar	25.03.2011 to 24.03.2014	25012/56/99-Silk dated 25.03.2011	4(3)(g)
13	Director of Industries, Govt. of Himachal Pradesh.	25.03.2011 to 24.03.2014	25012/56/99-Silk dated 25.03.2011	4(3)(i)

The Nomination of the following six Non official Board Members nominated vide Gazette Notification No.25012/56/99-Silk dated 11.06.2008, 30.06.2008, 11.07.2008 and 02.03.2009, respectively have been terminated with effect from 16.08.2010 vide Notification No.25012/56/99-Silk dated 16.08.2010:

1. Ms. Deepa Gupta
2. Shri Dodla Varada Reddy
3. Shri K.P.S.Mani
4. Shri Anil Kumar, M.L.
5. Ms. Mamta Khandelwal
6. Shri M.Subramanya

During the period under report, Shri H.Hanumanthappa, and Ms.M.Sathiyavathy, IAS; continued to function as Chairperson and Member Secretary of the Central Silk Board, respectively.

A list of Members of the Board as on 31.03.2010 is at **Annex-I**

Change in Senior Level Officers

During the period under report, following changes took place in the level of Director:

- a. Dr.V.Sivaprasad has been appointed as Director, National Silkworm Seed Organization, Bangalore w.e.f. 08.10.2010

- b. Dr. Bharat Bhushan Bindroo, Scientist-D has taken over the charge of Central Sericultural Research and Training Institute, Berhampore on superannuation of Dr.R.K.Katri w.e.f. 22.11.2010.
- c. Dr. Arindam Basu has been appointed as Director, Central Silk Technological Research Institute, Bangalore w.e.f. 17.01.2011.

As per the decision of 126th Board Meeting held on 30.09.2010 at Mysore, the nomenclature of all Regional Development Offices of Central Silk Board has been changed as Regional Office of Central Silk Board.

- **Meetings of the Board and Standing Committee**

During the period under report, two Standing Committee Meetings on 22.07.2010 & 17.02.2011, and one Board Meeting on 30.09.2010 were convened.

- **Staff Strength of CSB**

The group-wise sanctioned strength and working strength of the Central Silk Board as on 31st March 2011 is indicated below :

Group	Sanctioned	Filled	GEN	SC	ST	OBC	PWD	TOTAL
A	950	861	614	143	50	48	6	861
B	1616	1589	1053	309	141	67	19	1589
C	1707	1544	771	451	217	79	26	1544
TOTAL	4273	3994	2438	903	408	194	51	3994
%			61.04	22.61	10.22	4.86	1.27	100

- **Implementation of Reservation Policy of the Government of India in the CSB**

In conformity with the instructions issued by the Government of India, the Central Silk Board has been following the reservation policy relating to reservation for Scheduled Castes, Scheduled Tribes, OBCs and PWD, in the matter of Direct Recruitment as well as promotions as prescribed from time to time. Out of the total staff strength of 3994 as on 31st March 2011, the CSB has 903 employees belonging to Scheduled Caste community representing 22.61%, 408 employees belonging to Scheduled Tribe community representing 10.22%, 194 employees belonging to Other Backward Communities and 51 belonging to PWD. The prescribed percentage of reservation is 15% for SC and 7.5% for ST, 27% for OBCs and 3% for PWD.

- **Recruitment of Persons with Disabilities (PWD) under CSB**

In conformity with the instructions issued by the Government of India, the Central Silk Board has been following the reservation policy relating to reservation for Persons with Disabilities in the matter of Direct Recruitment in all Groups as well as in Promotions in Group 'C' categories under (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995 as prescribed from time to time. The CSB has also identified the posts, the duties of which can be performed by various categories of Persons with Disabilities without loss of productivity. During the year under report out of 70 recruitments made, 4 officials are from PWD category.

- **Organizational Chart and Units of CSB**

The Organizational chart and the Units of Central Silk Board are also enclosed in **Annex-II**

- **Regional Offices of Central Silk Board**

In order to maintain liaison with the State and Department of Sericulture/ CSB units in its jurisdiction besides to coordinate the various Sericulture Development Programmes being

implemented in respective States, the **Regional Offices (ROs)** of CSB has been functioning in various locations with definite mandate viz., New Delhi, Mumbai (Maharashtra), Kolkata (West Bengal), Jammu (J&K), Hyderabad (Andhra Pradesh), Bhubaneshwar (Orissa), Guwahati (Assam), Lucknow (Uttar Pradesh), Chennai (Tamil Nadu) and Patna (Bihar). The brief activities of Regional Office are indicated below;

- Co-ordinate with State Institutions/ Governments and Central Units in assisting implementation of all sericulture development programmes/ projects in the respective state/region/zone.
- ROs are the Member Conveners of State Level Sericulture Co-ordination Committee meetings constituted by the CSB.
- Organize demonstrations, farmers' meets and entrepreneurship development programme.
- Collection of data pertaining to sericulture and silk industry, analysis and forward to the Central Office for maintaining MIS database.
- Conduct base-line surveys in selected areas on improvement in productivity and the cost incurred by Sericulturists.
- Identify gaps in Lab-to-Land and in the states and proposed schemes/suggestions to Central Office.
- Co-ordinate with the Directors of the Research Institutes in their jurisdiction in respect of field trials and surveys.
- Critically evaluate the work of the NGOs and other voluntary agencies in the state in respect of sericulture programmes.
- Maintain a close liaison with the State Sericulture Department/ Departments, field units and CSB field functionaries to co-ordinate transfer of technology etc.
- To implement "Other Development Programmes" being carried out with CSB funds in the States not entrusted to

- Research Institutes for implementation.
- Co-ordinate or organize trainings/workshops on the directions of Central Office and distribution of publications, extension materials, video films, etc.
- Undertake voluntary quality inspection of silk goods meant for exports.
- Assist States towards formulation, implementation and evaluation of Centrally Sponsored Catalytic Development Programme (CDP) being executed through CSB.
- To act as Central Public Information Officers (CPIOs) / Assistant Public Information Officers (APIOs) to provide information to the public as per the provisions of the RTI Act. 2005
- To coordinate implementation / execution of Silk Mark Chapters (“Silk Mark Organization of India”) of jurisdictional States.

Special assignments consequent on CDP implementation:

- Assisting DoS / RECs in undertaking periodical visits to study the impact of the Cluster Promotion Programme besides monitoring of regular CDP beneficiary assessment and its reporting to CSB/ SLSCC.
- Participation in the RAC/RRAC/ZPCC meetings as and when held, where RO is permanent invitee.
- Associating with DoS/ CSB in finalization of XII Five Year Plan proposals and participation in related meetings of CDP like PMC, Field Level beneficiary meetings including post-cocoon issues.
- Evaluation of Health Insurance Scheme being implemented in the concentrated Sericulture areas of States concerned Assisting DoS to assess the impact of the CDP scheme and to report feed back to CSB / State.

● **Computerization in the Central Silk Board**

The Central Silk Board has been utilizing the Information Technology in various operations of the organization from past 21 years. Central Silk Board has been effectively utilizing Information Technology resources to empower CSB in all the areas of its activities for efficient functioning.

The present set up of Information Technology infrastructure in the Central Silk Board consists of :

- There are about 950 computers in CSB, including servers, Core i3, Dual core & Pentium – IV computers and Notebooks, which are extensively used for Research data compilation, analysis, sericulture statistics, office productivity and routine correspondence in CSB and its nested units.
- Central Office and all the Research Institutes are having internet and email facility. In addition, most of the other CSB units have email facility.
- Linux, Sun Solaris, Windows Server 2003 operating systems are used in Servers. Windows 7, Vista, Windows-XP and Linux are used on desktop computers.
- MS-Office 2000 / 2007 / 2010 and Open Office are used for general office correspondence, research, technical and statistical data maintenance. Power Builder, VB .net, ASP .net, PHP, Java is used for developing front end and web interfaces on LAN. Oracle, My SQL, MS-Access and Foxpro are used for managing data, handled through applications. SPSS and Windostat are used for analysis of Research and statistical data and forecasting of cocoon arrivals in the market.
- Major applications and information systems presently in use (in house developed as well as outsourced) are :
 - i. Personal Information System
 - ii. Financial Accounting System / Payroll System

- iii. Confidential Reports
- iv. Address Master
- v. GSLIS Information systems
- vi. GPF Information System
- vii. Medical Bills Processing System
- viii. Research MIS
- ix. Sericulture Management Information System (SMIS)
- x. Sericulture Production Statistics
- xi. GPF Investment Management
- xii. Pension Processing
- xiii. Fixed Deposit Management
- xiv. Recruitment Information System
- xv. Indian Silk Magazine Monitoring System
- xvi. Medical Identity Card for Employees and their dependants

CSB hosts a website www.indiansilk.kar.nic.in / www.csb.gov.in (Beta version) as an enterprise information site in English and Hindi. In accordance to the Right to Information Act, all details are required under Section 4(1)(b) have been published in CSB website. The other Research units of CSB have also created websites to give Research and Scientific Information:

- i. CSRTI, Mysore - www.csrtimys.res.in
- ii. CSRTI, Berhampore - www.csrtiber.res.in
- iii. CSGRC, Hosur - www.silkgermplasm.com
- iv. CTRTI, Ranchi - www.ctrtiranchi.co.in
- v. CMERTI, Lahdoigarh - www.cmerti.res.in
- v. SMOI - www.silkmarkindia.com

CSB has developed contents for Sericulture Information Kiosk and presently it is installed at twenty eight locations – CSB Head Quarters, various DOSs, Govt. Cocoon Markets, CSB Research Institutes etc., in various states viz., Karnataka, Andhra Pradesh, Tamil Nadu, Kerala, Maharashtra, West Bengal and Jammu & Kashmir.

The Kiosks provide information on sericulture practices, mulberry cultivation, silkworm rearing and latest technologies, disease/pest control, prices of cocoon and raw silk, etc. Information Kiosk contents are in multilingual format (English, Kannada, Tamil, Telugu, Malayalam and Kashmiri) with audio and video clippings. During the year 2010-11, Bengali contents were developed and installed at 3 Kiosks at West Bengal. Management Information System (MIS), a web based application with a central server at Central Office is in progress. Hosting of the website www.csb.gov.in and e-mail service for CSB units and employees is deployed at Central Office with two servers with a high speed internet (Leased line).

CSB and its units have large number of computer savvy and computer literate end users. Senior officers take personal interest in IT planning and usage.

CSB had taken up the following activities under IT Initiative of the XI Five Year Plan :

- Computerization
- Knowledge Management
- Data Compilation & Dissemination through Portals
- e-Governance
- Networking (includes Kiosk hardware)
- Upgradation of existing Applications (includes Kiosk software)
- IT applications in Research & Development

Interactive Voice Response System (IVRS) has been set up at CSRTI, Mysore with a view to facilitate the stakeholders, who can dial the toll free number 1-800-425-0010 and directly interact with the scientists to obtain first hand information on region specific problems, technologies, to get suggestions/clarifications etc., instantaneously online. In case, the query needs some more clarification/information, it would be kept pending and the information will be passed on to the caller in due course through phone/post.

- **International Collaboration**

- **Central Silk Board as a Member of International Organizations**

Central Silk Board continued to be a member of the International Sericulture Commission (ISC), stationed at Lyon, France.

- **Visit of CSB Delegation/Officials to other Countries**

- **Participation in International Meetings/Symposium/Conference**

- Ms. M. Sathiyavathy, Member Secretary attended the Executive Committee Meeting of ISC at Lyon, France on May 11, 2010.
- A delegation comprising of Ms. Rita Menon, Secretary (Textiles), Ms. Sathiyavathy, Member Secretary, CSB, Dr. M.A. Khan, Director, CSRTI, Pampore, and Sri K Sukumar Menon, JD (C&ED) visited the sericulture areas of China, viz. Nanning, Liuzhou, Guilin and Beijing from 5th to 9th April 2010, to study the development of sericulture in China.
- Sri S.S. Das, Director (Silk), MOT, and Sri K.S.S.Reddy, Scientist-D, CSB visited Hangzhou, China during 14th & 15th July 2010, to attend the meeting of ISO/TC/38/SC23/WG5 Fibres – Natural Proteins.
- Ms. Monica S Garg, Joint Secretary (Silk), MoT and Ms. Sathiyavathy, MS, CSB visited Nanjing and Beijing from 29th Aug. to 4th Sept. 2010, to explore the possibility of importing raw silk from China to India.
- Sri P. Mathiazhagan, Scientist-C, CSTRI, Bangalore attended the Centenary Conference of Textile Institute, Manchester, U.K, from 2nd to 3rd November, 2010.
- Ms. M. Sathiyavathy, Member Secretary, CSB, Ms. Urmimala Hazarika, Scientist-C, CMERTI, Jorhat, and Mr. Shillin Sangappa, Scientist-C, CSTRI, Bangalore, attended 6th International Conference on Wild Silk Moths at Japan from 21st to 24th Sept 2010.

- **Visits to other countries under Bilateral Programmes**

Dr. S. Sree Kumar, Scientist-C, CSRTI, Mysore and S.K. Aswath, Scientist-C, CSRTI, Mysore have been deputed to National Institute of Agro-biological Sciences, Tsukuba, Japan from 3rd to 17th November 2010 to undertake experiments as part of the DST-JSPS collaborative programme.

- **Vigilance**

The Vigilance Cell at Central Silk Board, Bangalore has a staff strength of four i.e., 1 each of Assistant Superintendent, Assistant and 2 Upper Division Clerks and has been functioning under the supervision of the Assistant Director (Admn. & Accts.) / Joint Director (Admn.) who, in turn, reports to the Director / Chief Vigilance Officer and to the Board's Member Secretary. The Vigilance Cell also looks after the job of redressal of the grievances of the staff and the public and thus it is the Vigilance Cell as well as the Grievance Cell.

The main subjects assigned to the Cell with regards to the Vigilance aspect are furnished below in brief : -

- Identification of points and sensitive posts vulnerable for corrupt practices and carrying out surprise and periodical inspections of the various Units of the Board as and when the situation demands.
- Initiation of Disciplinary Cases against the officials concerned arising out of complaints/ Preliminary Investigation Reports, inspections of surprise as well as regular nature / CBI Investigation Reports and of Internal Audit Reports, etc.
- Processing of files at different stages (beginning with the receipt of complaints and Reports) which culminate in the Imposition of Penalty and later on at the stage of appeal and of the Writ Petitions filed by the aggrieved.

Measures taken to strengthen the preventive vigilance by streamlining of procedures

The Units of the Board which are considered sensitive areas have been identified and measures for preventive vigilance, surveillance and detection have been taken. Besides the Chief Vigilance Officer, Directors of the Board stationed at different Zones have been entrusted with the task of surprise inspection of the Units / sensitive areas clearly demarcating areas of jurisdiction. An Internal Audit Wing - headed by a Director (Finance) supported by Zonal Audit teams in different Zones - has been functioning to conduct the Internal Audit on the accounts of all the Units. The Directors of the Institutes and the officers of the rank of Scientist-E / Scientist-D / Joint Secretary holding independent charge of the various Units have been delegated with powers to function as Disciplinary Authority in respect of certain categories of officials. The complaints and petitions received are examined and action taken as and when a *prima facie* case is established.

Expediting the completion of Preliminary Investigations / Oral Inquiries

Preliminary Investigation wherever ordered is being completed as early as possible and action taken on the findings of the Investigation Officers. During the period concerned, i.e. from 01-04-2010 to 31-03-2011, four Disciplinary Cases have been initiated and 21 Cases were pending for disposal as on 31-03-2010. And out of the total of 25 Cases (four plus 21), 13 have been finalised during the period; the remainder of 12 are pending for disposal as on 31-03-2011. With regard to the oral inquiries [in the Disciplinary Cases initiated under Rule 14 of Central Civil Services (Classification Control & Appeal) Rules, 1965 (Major Penalty Proceedings)], senior officers from the Board and Retired Judges are appointed as the Inquiry Officers and all the Inquiry Officers are periodically advised to complete the Inquiry process within the specified time limit.

Disposal of Appeal Petitions filed by the delinquents against the Penalty Imposition made by the Disciplinary Authorities

During the period, two appeals (filed against Penalty Imposition) have been received and they have been disposed of by the Appellate Authority (the Member Secretary).

Observance of Vigilance Awareness Week

In accordance with the guidelines issued by the Ministry / Central Vigilance Commission, New Delhi, Vigilance Awareness Week was observed at the Central Silk Board's Head Quarters and at all its subordinate Units between 25-10-2010 and 01-11-2010 in a befitting manner.

Steps taken to activate the Grievances Machinery in the Board

As per the instructions of the Ministry, senior officers of the Board of the cadre of Director / Scientist-E / Scientist-D holding independent charge have been nominated as the Grievance Officers to attend to the grievances of the staff and from the public. During the period concerned, i.e. from 01-04-2010 to 31-03-2011, 36 grievance petitions have been received and eight were pending for redressal as on 31-03-2010. And out of the total of 44 (36 plus eight), 31 have been redressed during the period; the remainder of 13 are pending for redressal as on 31-03-2011.

- **Implementation of Official Language Policy**

Central Silk Board, Bangalore bagged second prize of Indira Gandhi Rajbhasha Puraskar for excellent performance in implementation of Official Language Policy for the year, 2008-09 conferred by the Dept. of Official Language, Ministry of Home Affairs, Govt. of India, New Delhi. The Member Secretary Smt. M. Sathiyavathy, Central Silk Board, Bangalore received the award from His Excellency Vice-President Md. Hamid Ansari on 14th September, 2010. During the period under report, efforts were 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, 2010-11. As a result of accelerating the progressive use of Hindi in Official purposes, many Offices of Central Silk Board were awarded from different Forums. The Central Sericultural Research & Training Institute, Berhampore and Muga Silkworm Seed Organization, Guwahati received first and third prize, respectively for implementation of Official Language for the year, 2009-10 on 24th March, 2011. The Regional Sericultural Research Station, Salem received third Prize from Town Official Language Implementation Committee, Salem for the year 2009-10. The Muga Silkworm Seed Organization, Guwahati and Regional Office, Guwahati each received citation also from Town Official Language Implementation Committee, Guwahati.

Compliance of Official Language Act, 1963 & Rules, 1976

Apart from ensuring cent percent compliance of Section-3(3) of the Official Language Act, 1963, letters received in Hindi were replied to in Hindi and bilingual only under Rule-5 of Rules, 1976. Targets fixed for original correspondence, fax etc., in the Annual Programme 2010-11 were also achieved. Ninety seven Offices including Board Secretariat have so far been notified under Rule 10(4) of Official Language Rules, 1976.

Meetings

Quarterly meetings of Official Language Implementation Committee which monitors Official Language Implementation Programme in Board Secretariat, Research Institutes and other main Subordinate Offices were held regularly. In most of the Sub-Ordinate Offices also the meetings of Official Language Implementation Committee were held regularly.

Hindi Fortnight

Hindi Fortnight was observed jointly by Central Office, National Silkworm Seed Organisation and Central Silk Technological Research Institute, Bangalore from 14th September, 2010 to 28th September, 2010 in CSB premises in Bangalore and competitions i.e., Hindi Reading, Handwriting, Noting-Drafting, Dictation, What does the picture say?, Cross Word, Glossary, Memory Test, Oral Quiz, Vividha and Hindi Songs, etc. were organized. Hindi Fortnight Valedictory and Cultural Programme-cum-Prize Distribution function was organized on 28th October, 2010. Hindi Day/ Week/ Fortnight was also organized in all the Attached/ Sub-ordinate units of the Board.

Hindi Workshop

Board Head Office organized four one day full-time Hindi Workshop for the Employees on 26.06.2010, 09.09.2010, 23.12.2010 & 16.03.2011 and one day full-time Hindi workshop was organized for Officers on 17.03.2011. Hindi Workshops were also organized in Attached & Sub-ordinate Offices of the Board.

Software and its use

'Leap Office 2000' is being used in various Units/Centres of Central Silk Board. It has facilitated Employees in many ways and use of Hindi has got momentum to a considerable extent. In addition, following the instruction of Department of Official Language, Unicode software is also being used in all main Institutes and RO's of CSB.

Inspection

Inspection pertaining to the implementation of Official Language was carried out in 51 Attached and Sub-ordinate offices of the Board.

Publication

'Resham Bharati' – a House Journal devoted for promotion of Official Language was published by Central Office. The Central Office continued to publish Annual Report, 2009-10, Annual Accounts

& Audit Report, 2009-10 in Hindi. CTR&TI, Ranchi published "Parichayatmak Brochure, Magnesium Sulphate Ka Anuprayog – Package Booklet and Anda Dhone Evam Satah Visamkraman Ki Unnat Proudhyogiki" and "Technology Manual on Post-Cocoon Activities book in Hindi. REC, Palampur, Himachal Pradesh Published "Oak Tasar Resham Proudhyogiki Nirdeshika Evam Vyavaharik Kayiki Pustak in Hindi. RTRS, Bhandara, Maharashtra published "Ushna Katibandia Tasar Resham Utpadan Evam Teknik–Ek Saral Parichay Pustika" and "Tasar Resham Udyog–Jeevikoparjan Ka Sadhan" Pamphlet in Hindi.

Visit of third Sub-Committee of the Committee of Parliament on Official Language

The Third Sub-Committee of the Committee of Parliament on Official Language visited CSRTI, Srinagar on 05.07.2010 and Regional Office, Mumbai on 14.09.2010.

Rajbhasha Orientation Programme

The CTRTI, Ranchi organized Orientation Programme for Staff of Jharkhand Sericulture Department on 06.06.2010 in Hindi and Rajbhasha Orientation Programme for Officers/Staff on 09.09.2010.

Translation

The Board Secretariat Translated Annual Report, 2009-10, Annual Accounts & Audit Report, 2009-10, "Notification of Seed Area and Varieties", "Training Courses for Sericulture Sector in Central Silk Board (Calendar 2010-11)", "Examination of Detailed Demands for Grants of Ministry of Textiles for the year 2010-11 by Standing Committee on Labour - List of Points on Demands for Grants" and "Note on the performance of Indian Silk Industry and Functioning of Central Silk Board".

Rolling Shield Award

In order to accelerate the tempo of implementation of Official Language in Board Secretariat and its attached units, Central Silk Board has introduced Rajbhasha Rolling Shield

Scheme from 1993-94 which envisages awards for their performance during the year. A provision for a separate Rolling Shield has also been made for the Sections of the Board Secretariat. The recipients of the award for the year, 2009-10 were Muga Silkworm Seed Organization, Guwahati; Basic Tasar Silkworm Seed Organization, Bilaspur; Zonal Office, DCTSC, Bilaspur and Basic Seed Multiplication & Training Centre, Sundargarh. Among the Sections of the Board Secretariat, Establishment Section-I bagged the Rolling Shield for the year, 2009-10. CTRTI, Ranchi, CSRTI, Berhampore and CSTRI, Bangalore also have introduced Rajbhasha Rolling Shield Scheme to boost the implementation of Official Language Policy in the main Institute and in their respective Units & Sections.

Competitions

The Board Head Office organized a 'Sahi Shabd Kya Hai?' competition on 23.11.2010 on the occasion of Joint Hindi Fortnight at Town Level in the auspices of Town Official Language Implementation Committee, Bangalore, in which candidates from the Central Govt. Offices, Autonomous Bodies and Statutory Bodies located in Bangalore participated. The CSTRI, Bangalore also conducted 'Quiz' competition under the auspices of TOLIC, Bangalore on 04.11.2010.

Public Information Cell - Implementation of Right to Information Act, 2005

The Central Silk Board (CSB) has setup an "Information Centre" at its headquarters at Bangalore to facilitate computerized public interface aimed at dissemination of information to the public on the services and activities of Central Silk Board. The "Information Centre" provides information on major activities of Central Silk Board, its organizational setup, services offered by the Board, technological advancement in sericulture and silk industry, prices of silk commodities, sericulture production data, silk export, import statistics, schemes/projects

implemented by the Board either directly or through the Department of Sericulture, NGOs, training imparted by various CSB units, literature, periodical publications, books, sericulture films available for sale, facilities provided by the Board on quality testing, certification, seed supply etc., to farmers, reelers, weavers, NGOs, quality clubs and other interested public. The “information Centre” is equipped with KIOSK, computer, printed materials like pamphlets, brochures, leaflets, display boards etc.

The Ministry of Agriculture, Govt. of India has launched “Kisan Call Centres” throughout the Country by a network of call centres, which enable the farmers to get expert advice on demand through a toll free number 1551. Central Silk Board has integrated “CSB Information Centre” to the “Kisan Call Centre” to provide sericulture related information to the general public as well as stake holders of silk industry. Govt. of India has identified

Central Silk Board (CSB) as level II experts of this “Kisan Call Centre” network.

The role & scope of the Information Centre has been broadened consequently upon enactment of the Right to Information Act, 2005. The Central Silk Board has designated as many as 37 Central Public Information Officers (CPIOs) and 215 Assistant Public Information Officers (APIOs) in the Central Silk Board Head Quarters and its sub-ordinate units to provide information to the Public as per the provisions of the Right to Information Act, 2005. The Public Information Cell receives application from the applicants and sends it to the concerned Central Public Information Officer for processing and furnishes reply to the applicant as per the provisions laid down under the Right to Information Act, 2005. During the year under report, the CSB has received and processed 152 applications received from different applicants under the RTI Act, 2005.



FINANCE & ACCOUNTS

• **Receipts (Grant-in-Aid) for the year 2010 - 11**

Grants-in-Aid for the year 2010 - 11

In accordance with Section 9(1) of Central Silk Board Act, 1948, the Central Government released the Grant-in-Aid to the Central Silk Board during the year 2010-11 for enabling it to exercise the powers and discharge its functions under the Act. The details of the Grants-in-Aid released by the Government of India, Ministry of Textiles, New Delhi for the financial year 2010-11 are as under:

Non-Plan

[Figures in lakh rupees]

1.	Grants towards Administration of C.S.B.	18597.25
2.	Grants towards Development of Silk Industry	1800.00
	Total	20397.25

Plan

1.	Grants towards Administration of C.S.B.	4500.00
2.	Grants towards Development of Silk Industry	20500.00
3.	Grants towards Projects/Schemes in NE States Including Sikkim	7000.00
	Total	32000.00

Grand Total (Plan and Non-Plan)

1.	Grants towards Administration of C.S.B.	23097.25
2.	Grants towards Development of Silk Industry	29300.00
	Total	52397.25

• **Expenditure for the Year 2010 - 11**

Expenditure incurred / booked by the Board and its attached units during the financial year 2010-11 are as follows.

Non-Plan

[Figures in lakh rupees]

1.	Administration of Central Silk Board	18597.25
2.	Dev. of Silk Industry	1800.00
	Total	20397.25

Plan

[Figures in lakh rupees]

1.	Administration of C.S.B.	4500.00
2.	Dev. of Silk Industry	20500.00
3.	Grants towards Projects /Schemes in NE States Including Sikkim	7000.00
	Total	32000.00

Grand Total (Plan and Non-Plan)

[Figures in lakh rupees]

1.	Administration of Central Silk Board	23097.25
2.	Dev. of Silk Industry	29300.00
	Total	52397.25

Loan for the Year 2010-11

No Loan amount was released by the Ministry of Textiles to Central Silk Board towards House Building Advance during 2010-11.

- Provisions approved for the year 2011-12.**

Provisions approved by the Ministry of Textiles against Vote on Accounts for the year 2011 - 12 – Demand No.93 of MOT

Non-Plan*[Figures in lakh rupees]*

1.	Administration of Central Silk Board – Grants –in- Aid – General [01.01.31]	18846.00
2	Development of Silk Industry - Grants –in- Aid – General [01.02.31]	1800.00
	Total	20646.00

Plan-General*[Figures in lakh rupees]*

1.	Administration of Central Silk Board – Grants –in- Aid – General [01.01.31]	2600.00
	Grants towards Creation of Capital Assets - [01.01.35]	1900.00
2	Development of Silk Industry - Grants –in- Aid – General [01.02.31]	5899.00
	Grants towards Creation of Capital Assets - [01.02.35]	5801.00
3	Catalytic Development Programmes - SC - Grants –in- Aid – General [09.00.31]	1000.00
	Grants towards Creation of Capital Assets - [09.00.35]	4000.00
	Catalytic Development Programmes – STGrants –in- Aid – General [09.00.31]	500.00
	Grants towards Creation of Capital Assets - [09.00.35]	600.00
	Total	22300.00

Plan - NE [North-eastern Region]*[Figures in lakh rupees]*

1.	Development of Silk Industry - Grants –in- Aid – General [01.00.31]	1633.00
	Grants towards Creation of Capital Assets - [01.00.35]	5867.00
2	Administration of Central Silk Board – Grants-in-Aid – General [02.00.31]	1100.00
	Grants towards Creation of Capital Assets - [02.00.35]	400.00
	Total	9000.00

Grand Total (Non-Plan + Plan + NE)

[Figures in lakh rupees]

1.	Administration of Central Silk Board – Grants –in- Aid – General	22546.00
	Grants towards Creation of Capital Assets -	2300.00
2	Development of Silk Industry - Grants-in-Aid – General	9332.00
	Grants towards Creation of Capital Assets -	11668.00
3	Catalytic Development Programmes - SC - Grants-in-Aid – General	1000.00
	Grants towards Creation of Capital Assets -	4000.00
	Catalytic Development Programmes – ST Grants-in-Aid – General	500.00
	Grants towards Creation of Capital Assets -	600.00
	Total	51946.00

● **INTERNAL AUDIT**

The Internal Audit wing of the Central Silk Board has formed at Board's Secretariat and Five Zonal Internal Audit Teams (A to E) at CTRTI Ranchi, CSRTI- Berhampore, CSRTI-Mysore, RSRS-Jammu and MSSO, Guwahati to conduct audit work in different units of the Board. The Internal Audit Teams had conducted Internal Audit at 106 delegated units and 91 non-delegated units during the year 2010-11.

In addition, the Internal Audit had also given opinion in respect of 50 cases referred on different service matters during the year 2010-11. Besides, 25 A.Gs Audit Report pertaining to various units of CSB had been received and suitable replies were furnished to the respective Accountant Generals during the year 2010-11. The Internal Audit also proposed to develop web based/stand alone software package called Audit Management System to computerize auditing system of the Board and the same will be introduced during the year 2011-12.



PROJECTS / SCHEMES

● **Implementation of Catalytic Development Programme and other Programmes during XI Plan (2007-12)**

The XI Plan envisaged development of Sericulture, which has many facets – increase in area under Mulberry, enhance production, productivity and quality, Poverty alleviation, generation of employment and income and also increase in family income.

During the XI Plan, it is proposed to intensify the R&D activities to improve the productivity and quality to complement the expansion programme to reach the envisaged production of 26,000 MTs of raw silk by end of the XI Plan. To carry out the additional research and developmental activities, it is necessary to develop infrastructure, human resources and other facilities.

During the Plan period it is targeted to produce 26,000 MTs of both mulberry and non-mulberry silks and generate a cumulative employment of 77.04 lakh persons. Special status has been given to North-eastern Region, Jammu & Kashmir, Jharkhand, Chhattisgarh, Uttarakhand and Himachal Pradesh States for development of sericulture and silk industry.

Catalytic Development Programme (CDP)

CSB, being a Science and Technology (S&T) Research and Development organization, the main thrust has been on Research based activities as also covering areas like Seed maintenance & production and Development of Sericulture & Silk Industry. As a part of its developmental initiatives, CSB has implemented Catalytic Development Programme (CDP) as a Centrally Sponsored Scheme during IX, X & XI Plan periods, in association with State Sericulture Departments and other implementing agencies to supplement their efforts in achieving the goals set for the Plan period. CDP is the flagship Scheme of Sericulture, being implemented by Ministry of Textiles through Central Silk Board in collaboration with States. It

consists of various components and sub-components for promotion of all varieties of silks in India.

The objective of the programme is to focus on complete and holistic development of Sericulture Industry in the country involving States and beneficiaries for sustainability and improvement in output, in terms of quality and quantity. The CDP is a unique and effective tool for transfer of technologies evolved by the Research institutes in the field and has made a visible impact on quality of silk produced in the country since IX Plan.

The Catalytic Development Programme (CDP) consists of various components and sub-components under Mulberry, Tasar, Eri and Muga and support service sectors. The programme is being implemented as a Centrally Sponsored Scheme with certain modifications but in a package-mode during XI Plan. The components are beneficial for both existing and new farmers for practising sericulture. The State Departments of Sericulture have to identify existing as well as new farmers and offer the components according to their requirements from out of a basket of components. The packages under CDP cover three major areas – Seed sector, Cocoon sector and Post-Cocoon sector and would be supplemented by other components of support services, which are common to all packages. Within each package, flexibility has been built-in to cater to the specific needs of different seric-zones in the country.

- The package under seed sector will have components for seed production in the Public / Private sector and / or with public-private partnership in case of Mulberry sector and through support to States and also for private Graineurs in the Vanya sector.
- The package under cocoon sector supports components for food plant development

(Mulberry varieties like V-1) together with the technology for a concerted effort to produce Bivoltine silk, supply of rearing equipments including improved mountages, irrigation facilities, construction of rearing houses, supply of disinfectants, chawki rearing centre, with the essential insurance coverage for all sectors under Sericulture.

- Package for Post-cocoon sector covers components for silk reeling & spinning, silk weaving, silk wet processing and by-product utilization and also for marketing support.
- The above packages would be supplemented by other components of Support Services, which are common to all packages.

The programme envisages implementation of 50 Cluster Development Projects in selected clusters (40 clusters in Cocoon Sector and 10 clusters in Post-cocoon Sector) directly by CSB through the Field Units of Central Silk Board (Regional Office, Research Extension Centre, Basic Seed Multiplication-cum-Training Centres, Demonstration-cum-Technical Service Centres), involving 250-300 stakeholders per cluster. Besides, CSB in coordination with the state DoSs is implementing cluster promotion programme by utilizing the provisions and facilities available under the CDP components.

CSB would give preference to Corporate Bodies also with emphasis on Post-cocoon Sector, on larger scale through hinter-land approach. The corporate bodies would be encouraged to setup large seed production units, chawki rearing centres and supply the chawki worms to large number of small and medium farmers in selected clusters of the hinterland area and buy back the cocoons on quality based pricing system. The corporate bodies would be encouraged to set up large-scale reeling and post-reeling units to produce quality silk. CSB will provide required technical & training support

in all areas of sericulture.

Outlay approved for XI Plan

The total Outlay for implementation of the CDP during the XI Plan is pegged at Rs.1476.24 crores of which CSB's share is Rs.661.62 crores. The entire expenditure is of non-recurring nature. The scheme was approved by the Expenditure Finance Committee (EFC) in the Ministry of Finance on 2nd November, 2007 and subsequently by the Cabinet Committee on Economic Affairs (CCEA) on 24th January, 2008. Formal approval of Govt. of India for implementation of CDP in the country during XI Plan was received on 1st February, 2008.

During the years 2007-08, 2008-09, 2009-10 and 2010-11 against the total outlay of Rs.81.01 crores, Rs.76.73 crores, Rs.146.12 (revised outlay) and Rs. 245.23 crores, respectively, a sum of Rs.80.82 crores, Rs.90.74 crores, Rs.144.06 crores and Rs.260.89 crores has been spent / released by CSB to States / CSB units towards implementation of various components under CDP. Of which about 20% of funds during every year has been earmarked for welfare of SC / ST beneficiaries. The scheme-wise details of Physical target & Financial Outlay and achievements made during 2007-08, 2008-09, 2009-10 and 2010-11 are furnished in **Annexure-III**.

Project outcome

During the year 2010-11, the provisional production of mulberry raw silk is 16,957 MTs as compared to the mulberry raw silk production of 16,322 MTs during the previous year 2009-10, indicating an increase of 3.90%. The provisional production of vanya silk viz. Tasar, Eri and Muga raw silk during 2010-11 is 1166, 2760 & 122 MTs, respectively as compared to the production of 803, 2460 & 105 MTs, respectively during the previous year 2009-10. This shows increase of 45.20% in Tasar, 12.20 % in Eri and 16.20 % in Muga raw silk, respectively.

Employment generation during the year 2010-11 is expected to reach 72.50 lakh persons as against the employment of 68.17 lakh persons generated during 2009-10.

On the export front, during the year 2010-11 the provisional export earnings are expected to reach Rs.3240 crores as compared to Rs.2892.44 crores achieved during the previous year 2009-10 indicating an increase of 12%. Implementation of Cluster Promotion Programme in States In pursuance of the suggestion from the Planning Commission and Ministry of Textiles, Govt. of India, Central Silk Board in association with the State Sericulture Departments is implementing Cluster Promotion Programme during XI Plan for promotion and development of sericulture on a sound footing in a limited geographical area by means of transfer of latest technology in a systematic way and also through infrastructure upgradation of farmers, improvement of skills and knowledge of farmers and strict discipline in sericulture practices to improve production, productivity and quality of cocoons to support the targeted production of both mulberry and vanya silks during XI Plan.

Under the Cluster Promotion Programme, 45 model sericulture clusters organized in 16 States in pre-cocoon sector in close coordination with the State Sericulture Departments continued during 2010-11. These clusters have covered around 10,441 farmers both in mulberry and Vanya sectors. The sector-wise break up of clusters is furnished below :

Sl. No.	Sector	No. of clusters (Pre-cocoon)
1	Mulberry	31
2	Muga	4
3	Eri	3
4	Tasar	3
5	Oak tasar	4
	Total	45

During the period under report, CSBs share of 14.54 Crores was released under CDP mainly towards raising plantation, supply of rearing appliances, construction of rearing houses, seed production, farmers training/study tour, post-cocoon activities etc. The Sector-wise break-up of CSBs share of funds released during 2010-11 under cluster promotion programme is given hereunder:

(in lakhs)

Sl.No.	Sector	States	No. of clusters	CSB share released 2010-11
1	Mulberry	Karnataka (7), Andhra Pradesh (6), Tamil Nadu (6), J&K (4), Maharashtra (3), Mizoram (1), West Bengal (2), Uttarakhand (1), Assam (1)	31	1061.422
2	Muga	West Bengal (1), Assam (2), Meghalaya (1)	4	141.80
3	Eri	Nagaland (1), UP (1), Assam-BTC (1)	3	230.323
4	Tropical Tasar	Chhattisgarh (1), Orissa (2)	3	4.253
5	Oak Tasar	Manipur (2), Uttarakhand (1), HP (1)	4	16.793
		Total	45	1454.591

The silkworm rearings have been conducted in all the identified mulberry and vanya clusters. As regards mulberry sector, in southern states of Karnataka, Tamil Nadu, Andhra Pradesh and Maharashtra emphasis is laid on rearing bivoltine during favourable seasons and multi-bivoltine in un-favourable seasons.

The crop performance is encouraging with an average cocoon yield of around 62 kg/100 dfls in bivoltine and around 61 kg in multivoltine hybrids. The cocoon yield in other states are also showing improvement around 45 kg/100 dfls in West Bengal and around 36 kg in Jammu & Kashmir, 35 kg in Uttarakhand, 52 kg in Assam and 36 kg in Mizoram per 100 dfls. The cocoon yield was reported to be higher than the average bench mark production in mulberry sector. In Vanya Sector, there was significant improvement with around 49 muga cocoons/dfls as compared to benchmark production of 30 cocoons/dfl. In eri Sector, the average yield was around 7.2 kg cut cocoons/100 dfls. The crop performance was encouraging with an average yield of 71 tasar cocoons/dfl in Orissa and 48 in Chhattisgarh as compared to bench mark production of 20 cocoons/dfl. In oak tasar the yield/dfl was around 19 which is *on par* with bench mark (20 cocoons).

This apart, CSB in co-ordination with the States has organized 5 post-cocoon clusters, one each in Tamil Nadu, West Bengal, Andhra Pradesh, Maharashtra and Assam and CSBs share to the tune of 0.72 Crores has been released to the states of Tamil Nadu and Maharashtra during 2010-11.

CSB has constituted the Crop Review Committees to monitor and evaluate the crop performance in the pre-cocoon clusters and to suggest suitable measures for crop improvement. The crop review is being conducted on a regular basis, besides monitoring at the State level. The Central Level Monitoring of the cluster programme is also conducted periodically to review the overall performance, constraints/problems and other related matters.

- **Vanya Silk Market Promotion Cell (VSMPC)**

Vanya Silk Market Promotion Cell (VSMPC) was established under X Plan CDP scheme with an objective of providing input support to Vanya

Silks in the areas of Market Promotion, Product Development and Diversification. The activities of VSMPC are continued during XI Plan at an outlay of Rs.100.00 Lakhs.

During the year 2010-11 VSMPC has focussed on the following activities :

- **Publication of Directory of Vanya Silk Manufacturers, Traders, Retailers and Exporters and Information Brochure on Vanya Silks :**

Vanya Silk Directory has been printed and published. The directory was released on 18th May 2010 by the Hon'ble Union Minister of State for Textiles, Govt. of India during the Workshop on Recent Advances in Sericulture organized by CSB in Bangalore.

The copies of the directory are sent to the sub-units of CSB for sale. The directories are also being sold through Silk Mark Expos, P3D Cell of CSTRI, VSMPC and in other exhibitions.

- **Organizing & Participation in Exhibitions**

During the year, VSMPC participated in Ten Silk Mark Expos – held at Kolkata, Bhubaneswar, Visahakapatnam, New Delhi, Lucknow, Jaipur, Bangalore, Chennai, Chandigarh and Mumbai. VSMPC in association with CSTRI Bangalore, CSRTI Mysore &, CTRTI Ranchi & their sub-units has organized exclusive Theme-Pavilion in all the 10 expos. The theme-pavilion was more informative, educative to the people visiting Expos. The live silkworms were displayed in the theme pavilion. Exclusive Vanya Silk products developed under different collaborative projects by VSMPC & P3D Cell - CSTRI and also developed under R&D activities of CSTRI were displayed in the Theme Pavilion. Some of the products were displayed through Fashion shows.

VSMPC and P3D Cell – CSTRI have also participated with a Silk Theme Pavilion in Tex-Trend - B2B Exhibition In New Delhi by MoT, India Handicraft and Gift Fair, B2B Exhibition in Greater

Noida, organized by Export Promotion Council for Handicrafts, 66th Textile Conference organized by TAI Karnataka Unit at NIMHANS Convention Centre, Bangalore, Nature Fest Exhibition in Kolkata organized by NABARD, Adivasi Exhibition organized by the ST & SC Development Dept., Govt. of Orissa at Bhubaneswar through RDO, CSB, Bhubaneswar and in HARSHAKALA exhibition in Bangalore organized by Dept. of Handlooms and Textiles, Govt. of Karnataka.

The participation and display of Vanya silk products in the above exhibitions have generated an awareness of Vanya Silks among all categories of people who visited the exhibition and the Central Silk Board's role in the development of Silk industry. The Generic and Brand promotion of Vanya Silks and Silks of India is being done through this participation.

In order to encourage the primary manufacturers of North-East to participate in Silk Mark Expos, VSMPC has provided a subsidy of 75% in stall rent to 5 primary Vanya Silk manufacturers from North-East for participation in Silk Mark Expo, Bangalore.

➤ **Participation in International Exhibition**

VSMPC has participated in Heimtextile Fair, Frankfurt, Germany held between 12th and 15th January 2011 along with SMOI for Generic and Brand Promotion of Indian silk. The publicity materials have been displayed and distributed mainly to the buyers as a part of publicity / propaganda.

➤ **Vanya Silk Shoppees - Advertisement, Sales promotion, Upgradation and Maintenance**

Three Vanya Silk Shoppee's (One in Bangalore and Two in New Delhi) were due for fresh allotment for new beneficiaries. As per the decision of the Vanya Silk Shoppee Management Committee (VSSMC) constituted for allotment and

management of Vanya silk shoppee, the shoppees are allotted to the new producers of Vanya Silk Products for 2 years duration to help the producers in establishing a firm link with the consumers and exporters etc.

Wide publicity is given to Vanya Silk Shoppee through print media, web-site etc. for sales promotion. Air conditioner is provided to Vanya Silk Shoppee at Bangalore and New Delhi and regular maintenance is being taken up.

VSMPC has extended all support to Vanya Silk Shoppee allottees in sales promotion, preparing suitable advertisement, providing linkages with designers, boutiques and bulk consumers etc.

➤ **Collaborative Projects with other Institutions – Product Development and Diversification**

a) NIFT-TEA Knitwear Fashion Institute, Tirupur : The collaborative project with NIFT- TEA KFI, Tirupur "*Vanya Silk Knitwear Development for Test Marketing*" is taken up. Under this project 200 kg of Eri spun silk has been supplied for development of commercially viable Eri silk knitwear products. NIFT-TEA has developed 337 products in different designs for Men, Women and Kids. These products are developed in association with SMOI for Test marketing.

VSMPC has supported NIFT-TEA Knitwear Fashion Institute, Tirupur in establishing the *Vanya Silk Display Centre* in its premises. The centre will display the Vanya silk products, viz , cocoons, yarns, fabrics and products for the information of the students and the industry / trade visitors to the Institute.

b) Sportking Institute of Fashion Technology (SIFT), Ludhiana : VSMPC has entered in to a collaborative project with SIFT, Ludhiana to develop a range of exclusive flat bed knitted products like outer wear for ladies, gents

and children like – cardigans and sweaters, some fashion accessories and small range of home furnishings. Under this project, SIFT Ludhiana has developed few products for Ladies.

c) National Institute of Design – Ahmedabad : VSMPC has proposed to develop new designs for Vanya silk products under the collaborative project “*Development of Designs for Vanya Silk Products*” with NID, Ahmedabad. The project aims at design development – in fabric structure, textile design in dobby and jacquard; designs for printing for Vanya silk products – sarees, scarves / stoles, dress materials, furnishing fabrics, made ups etc.

Initially a team of 3 faculty members of NID, Ahmedabad have visited Vanya silk clusters of Assam and Chhattisgarh to study and understand the primary level of work, current level of prevailing skills, production levels, to have an idea of socio-economic status of people and to interact with artisans etc.

The NID team has submitted the field visit report and project proposal in three phases *Research and Documentation, Design Development and Branding and Packaging*. The field visit report was sent to the respective state departments (DOS/Dept.of Handloom & Textiles) of all the Vanya silk producing states for their views and comments. Based on the views received from the states CSB has requested NID to send the detail project proposal on Phase-2 ie., “*Development of Designs for Vanya Silk Products*”.

➤ **Test Marketing of Vanya Silk Products**

As a part of Vanya silk product development effort, VSMPC and P3D Cell of CSTRI and SMOI have developed diversified Vanya Silk products viz, Eri knitwear, Eri Denims, Eri x Mulberry dress material in association with NIFT-TEA Tirupur and M/s Span Inc, Bangalore. Under this 337 Eri silk knitwear products in 5 shades including Men’s wear – (T-shirt, Hooded Sweater, Innerwear),

Women’s wear (Tops in different styles, Innerwear) and Kidswear (Boys Top & Bottom set, Body suit, Strappy Vest, Gathered top) are developed in association with NIFT TEA KFI Tirupur. Under *Woven Products* Eri silk denim and Eri / Mulberry silk satin fabrics are developed by CSTRI. The exclusive Tasar silk and Tasar/Eri silk fabric was procured from M/s Jharcraft. Exclusive designs are created by the designer and the garments developed by M/s Span Inc, Bangalore under the supervision of the designer. 198 woven including Men’s wear (shirts, kurtas, over-shirts), Women’s wear (blouse, tops, dress, skirt, trouser, stole) are developed.

The Product Brochure was prepared with the basic information on Vanya silks and highlighting comfort properties of Knitwear and woven garments. The brochure was released in the launching of products in Silk Mark Expo – Chennai.

Test marketing is being done by SMOI through Silk Mark Expos. The products are launched in Silk Mark Expo in Chennai and Bangalore under the brand “*EXOTICA*”. Around rupees one lakh worth garments are sold in the Silk Mark Expo Bangalore, Chennai, Hyderabad and Chandigarh. The products have received good appreciation from the consumers in terms of material and designs.

➤ **Generic and Brand Promotion**

Vanya Silks has a Logo designed by NID, Ahmedabad and same was registered with Registrar of Trade Mark, Govt. of India in the name of Central Silk Board, Ministry of Textiles, Govt. of India. The Vanya Silk Logo is being used in all the publicity material, Hoardings, Handbills, Web-site etc. Wide publicity is given to Vanya silks logo during the exhibitions through paper advertisement, hoardings and carry bags.

The advertisements released by SMOI during the Expos and the festive season carry the Vanya Silk logo and the message about the Vanya

Silks. The hoardings and the press kits also carry the Vanya silk logo and the information on Vanya silks. VSMPC along with SMOI sponsored the printed carry bags with Silk Mark and Vanya silk logo on it. The carry bags were distributed to the participants of Expo for giving it to the consumers. VSMPC has released the advertisements in Indian Silk and Silk Mark Vogue magazines. The advertisements in respect of Generic promotion of Vanya silk are released in magazines viz., Grihashobha, Women's Era, Meri Saheli and Grihalakshmi.

➤ **Authorized User of Vanya Silk Logo**

In order to involve the stake holders of the Vanya Silk industry in Generic and Brand promotion of Vanya Silks, VSMPC has introduced the concept of Authorized User to authorize private manufacturers, retailers, exporters to use Vanya Silk logo for generic and brand promotion. During the year VSMPC has registered 12 Vanya Silk manufacturers as Authorized Users.

7. Product Design Development and Diversification Cell [P3D]

- P3D centre participated in 10 expos in the financial year 2010-11 viz., Kolkata, Bhubaneshwar, Vishakhapatnam, Lucknow, New Delhi, Jaipur, Bangalore, Chennai, Chandigarh & Mumbai. In these expos P3D section organized the theme pavilion to highlight the strides made in Vanya Silk.
- P3D also participated and organised theme pavilion in both Mulberry and Vanya Silk in various places viz.,
- Tex Trends India; Organized by MOT at New Delhi,
- Harshakala; organized by DOHT Karnataka, at Bangalore,
- 66th Textile Conference, organised by TAI at Bangalore,

- Farmers Meet at Belgaum, which were jointly organized by CSRTI, Mysore and CSTR, Bangalore.
- International Handicraft & Gift Fair, organised by HEPC, MOT at Greater Noida.
- Nature Fest Exhibition at Kolkata, Organized by NABARD.
- A special feature in the Bangalore expo was showcasing all the Cluster Saris such as Musical Sari and Aroma saris developed at Dharmavaram, The visitors, like exporters, retailers showed keen interest on these saris and wanted the Know-how.
- Showcasing of Vanya Silk (Tasar, Muga & Eri) in the space allotted was well received by the denizens of the various host cities.
- The First Ever Tex Trends India exhibition, organized by Ministry of Textiles, with the support of the Ministry of Commerce and Industry. All textile & allied councils held from 2nd February to 4th February 2011 and participated at the Pragati Maidan in New Delhi. It was organised under Reverse Buyers-Sellers meet scheme of Govt of India. The exhibition was jointly inaugurated by the Union Minister of Finance and the Union Minister of Textiles, GOI and was accompanied by the Union Minister of State for Textiles, GOI and Dignitaries from Ministries of GOI, New Delhi. P3D participated in this expo and arranged the Theme pavilion and showcased all types of Silks from silkworms to Muga in the exhibition. Extra weft sari and Eri silk garments. During the expo the silk activities in India were explained to all the Foreign and Indian Delegates.

The displays at "The Cocoon", P3D section, CSTR, CSB were well received, appreciated and accoladed by each & every individual on their visit to the centre.

Notable visitors during the period of report are as follows :

Date	Name of the visitor
07.04.2010	Shri Ph. Angele from Switzerland
26.04.2010	Shri M. K. Singh, Director of Seri., Madhya Pradesh.
18.05.2010.	Smt. Panabaka Lakshmi, Union Minister of State for Textiles, Govt. of India, New Delhi.
18.05.2010	Smt. Monica S. Garg, Jt., Secretary of MOT, New Delhi
18.05.2010	Shri Vivek Kumar Devangan, Commissioner; Govt. of Manipur.
20.05.2010	Shri Andi M. Ghalib, Let. General, Ambassador of the Republic of Indonesia, New Delhi.
09.06.2010	Shri S. D. Patery, Director of Seri, Govt. of Madhya Pradesh.
30.06.2010	Shri Manivannan, Director of Seri., Govt. of Karnataka, Bangalore.
25.01.2011	Smt. Mallika Shukla, Secretary, Fashion, NIFD, Bangalore.
15.02.2011	Shri Mitsui from Tokyo, Japan.
08.03.2011	Mr. Dong from China.

Training

The CSB organizes a number of training programmes at its Research and Training Institutes. The total number of persons trained during 2009-10 and 2010-11 is detailed below:

Sl. No.	Training courses	2009-10		2010-11		Category of Trainees
		No. of courses / batch	No. of persons trained	No. of Courses / Batches	No. of persons trained	
1	Structured Courses	2	41	2 (2 Batches)	49	DOS/NGO
2	Capsule Courses	30	1263	22 (84 Batches)	779	CSB/DOS / NGO
3	Adhoc Courses	69	3951	69 (167 Batches)	1593	Entrepreneurs/ Farmers
4	Skill upgradation and Management programmes		599	—	3591	Farmers & Officials
Total					5854	6012

Schemes & Projects being implemented / proposed to be implemented by CSB and States with External / Internal Assistance for development of Sericulture

● Projects with Overseas Funding

Manipur Sericulture Project (Phase-1) assisted by JICA

The Govt. of Manipur has implemented the Mulberry Sericulture Project with financial assistance from JBIC, Japan. The first phase of the project was approved with a total cost of Rs.134.52 crore. As per the revised Action Plan, due to appreciation in yen, the total cost of the Phase-I of the project raised to

Rs.154.99 crores with JBIC assistance of Rs.136.66 crore and State share of Rs.18.33 crore. The first phase was completed in the year 2008-09. The project envisaged to increase the annual production of mulberry silk to 85 metric tons (2010-11) by the end of the gestation period of the first phase of the project besides equipping DOS staff with necessary skills and knowledge for extension of sericulture, improvement of facilities for training of farmers and other stakeholders in maintaining plantations, CRC Management, Silkworm Rearing and Reeling Operations etc., mass production of quality mulberry cocoons, marketing and production of raw silk, development of extension model for sericulture development, monitoring mechanism for extension system and formulation of action plan for subsequent development of sericulture in the State.

CSB undertook concurrent evaluation of the project activities and suggested consolidation of the project activities and commissioning of infrastructure for optimization of yield and productivity. Govt of Manipur consolidated the project activities by undertaking gap filling in the plantations, utilizing some of the chawkie rearing centres and improving conditions of rearing houses during 2009-10 & 2010-11.

During the project period from 2004-05 to 2010-11, a total of 42.449 lakh dfls were reared producing 1301 MT of cocoons against the target brushing of 53.664 lakh dfls and cocoon production of 2146.6 MT. An annual production capacity of 50.96 MT of raw silk was achieved against the envisaged target of 85 MT. The average cocoon productivity was 31 kg/100dfls against the target of 40 kg/100dfls. However, cocoon productivity varied between 28 kg to 52 kg/ 100 dfls between farmer to farmer and district to district. Details of dfls consumption, cocoon production and cocoon productivity are given in the table below:

Sl. No.	Year	Dfls. Utilization (In Lakh Nos.)			Cocoon Production (MT)			Cocoon yield / 100 dfls (Kg)	Raw Silk (MT)
		T	A	% Ach	T	A	% Ach		
1	2004-05	0.425	0.212	50	17.0	10.7	63	50	1.33
2	2005-06	1.700	0.525	31	68.0	27.4	40	52	3.43
3	2006-07	4.038	3.936	97	161.5	79.6	49	20	9.94
4	2007-08	7.438	3.311	45	297.5	118.7	40	36	14.84
5	2008-09	13.325	11.135	84	533.0	361.1	68	32	45.14
6	2009-10	13.345	11.744	88	533.8	334.1	63	28	41.76
7	2010-11	13.394	11.586	87	535.8	369.4	69	32	50.96
	Total	53.664	42.449	79	2146.6	1301.0	61	31	167.40

(T= Target, A=Achievement, % Ach= Per cent Achievement)

Further, a proposal for the Phase-II of Manipur Sericulture Project at a total cost of Rs. 356.50 crores is drafted and submitted to Govt. of Manipur for seeking financial assistance from JICA or State Plan Assistance. The approval of second phase of the project is under process.

Project for organizing III country training programme on Bivoltine Sericulture Technology assisted by JICA

The Japan International Cooperation Agency (JICA) and the Central Silk Board (CSB) have jointly worked in technical cooperation in the area of development and popularization of Bivoltine Sericulture Technology suited to Indian agro-climatic conditions for past fifteen years. In this cooperative endeavor, a good number of bivoltine silkworm breeds have been developed along with a comprehensive Bivoltine Sericulture Technology package and suitable model for Extension, Seed production system and generated well-trained manpower for further multiplication in the country.

Encouraged by the success of the Co-operation Programme, Central Silk Board in association with JICA has implemented a third country training programme on “Bivoltine Sericulture Technology” during 2008-09 for some of the Afro-Asian countries to disseminate the knowledge and skills on bivoltine sericulture technologies to these silk producing countries

and organized training for 11 officers in ‘Administrative Course’ and 15 officers in ‘Technical Course’ nominated from 8 different countries viz., Ghana, Cambodia, Uganda, Nigeria, Kenya, Philippines, Laos and Nepal.

The candidates trained under this training programme have appreciated the programme and based on the request from the participating countries, JICA has extended the training programme for 3 more years from 2009-10. The third Country Training Programme on “Bivoltine Sericulture Technology” is opened for the participants of 22 Afro-Asian Countries, viz, Bangladesh, Cambodia, Ethiopia, Ghana, Indonesia, Kenya, Laos, Madagascar, Nepal, Nigeria, Pakistan, Philippines, Sri Lanka, Vietnam Uganda, Cuba, Thailand, Kazakhstan, Uzbekistan, Kyrgyzstan, Egypt and Iran. During 2009-10, 13 officers were trained in ‘Administrative Course’ and 15 officers in ‘Technical Course’ and 28 candidates were trained during 2010-11. The number of candidates trained during 2010-11 is tabled below:

Sl.No	Name of the Sub-Course	Target	Achievement
1	Administrative Course (Two Weeks)	15	13
2	Technical Course (Twelve Weeks)	15	15

● **Projects with Internal Funding**

● **Special SGSY Projects**

Special SGSY Projects for development of Tasar and Eri cultures in Bihar and Jharkhand

Two special SGSY Projects for development of Tasar and Eri cultures are being implemented in the States of Bihar and Jharkhand with financial assistance from Ministry of Rural Development, Govt. of India from the year 2003-04. Central Silk Board is the Executing Agency, which closely monitors the implementation and extends the necessary technological support through units of CTRTI, Ranchi on pre-cocoon aspects, BTSSO, Bilaspur for seed requirement and CSTRI, Bangalore on post-cocoon activities. CSB also meets the entire requirement of basic seed through the BSMTCs in the two states. The projects are being implemented in both the States by Professional Assistance for Development Action (PRADAN), an NGO.

Financial outlay and sharing pattern of the Project cost are as follows.

(Rs. In Lakh)

Particulars		Bihar	Jharkhand (Phase-I) revised
Total Outlay	MORD	622.873	652.150
	CSB	208.614	302.681
	Beneficiary	289.044	247.274
	Credit	320.052	235.865
	Total	1440.583	1437.97

Development of Tasar and Eri-cultures in Bihar : The project is being implemented in Banka district of the State. The project progress as on 31st March, 2011 is as follows :

- Till March 2011, an amount of Rs.663.041 lakh was released under the project to PRADAN & CSB units in the project area,

which includes Rs. 495.426 lakh from MORD and Rs.167.615 lakh from CSB, excluding project administrative expenses spent by CSB for its personnel involved in project execution. The Project has mobilised credit to the tune of Rs. 338.215 Lakhs.

- 37 SHGs and 3051 Swarozgaris have been assisted under the project. 268.76 Ha. of block plantation, 2430 chawki garden units of 0.1 Ha. and 40.5 Ha. of castor have been raised.
- 762 Adopted Seed Rearers have brushed 1.67 lakh dfls of nucleus seed and harvested 95.87 lakh nucleus seed cocoons, of which 44.114 lakh cocoons were procured by BSMTCs for processing.
- 1885 seed rearers brushed 4.52 lakh dfls of basic seed and produced about 141.77 lakh seed cocoons, of which 102.95 lakh seed cocoons were procured and processed by 104 private graineurs to produce 25.898 lakh commercial dfls in 669 grainage operations. 11013 commercial rearers have brushed 23.14 lakh commercial dfls to produce 922.87 lakh reeling cocoons.
- 13 Rearers' Co-operative and 11 Reelers' and Spinners' Co-operative Societies have been organized, 15 resource personnel and 4841 Swarozgaris have been trained, 24 swarozgaries were taken on study tour and two farmers' days were conducted under the project.

Development of Tasar and Eri cultures in Jharkhand - Phase-I

The project was implemented in the districts of Giridih, Deoghar, Dumka, Pakour, Godda, Sahebganj, Jamtara, Ranchi, East Singhbhum, West Singhbhum, Saraikela, Simdega,

Hazaribagh and Gumla of Jharkhand. One new BSMTTC was established at Deoghar in the State and 3 existing BSMTTCs at Kathikund, Kharsawan and Madhupur were strengthened. The assisted 132 SHGs and 8136 Swarozgaris continued their activities during the period. Besides the Co-operative Society established involving private graineur groups has continued preservation of nucleus seed cocoons and production of basic seed. The Project has concluded by 31st March, 2011. Final report on conclusion of the project is due for submission.

Special SGSY Project for development of Mulberry Sericulture in Uttarakhand

The Ministry of Rural Development (MORD), Government of India has sanctioned a project entitled "A Special SGSY Project for Development of Mulberry Sericulture in Uttarakhand" at a total cost of Rs. 757.84 lakh to be implemented by Directorate of Sericulture, Govt. of Uttarakhand over a period of 5 years from 2007-08 to 2011-12. The funds are shared by MORD (Rs. 417.009 lakh) and CSB/State (Rs.153.899 lakh), Bank credit is Rs. 131.205 lakh and the beneficiary contribution is Rs. 55.727 lakh. Central Silk Board is the Executing and Coordinating Agency. The project is being implemented by DOS, Govt. of Uttarakhand in Nainital district from 2007-08 and by Grameen Krishi Vikas Samittee (GKVS)-NGO in Udham Singh Nagar district w.e.f. November, 2008.

Due to revision in the cost of rearing house and rearing appliances in the year 2007-08, the Project cost has been restructured to Rs. 917.840 lakh by revising CSB/State share at Rs. 379.636 lakh, (CSB – Rs. 299.383 lakh (excluding administrative cost to NGO) & State - 80.253 lakhs) Bank Credit Rs. 76.205 lakh and the Beneficiary Contribution being Rs. 44.991 lakh without any change in MORD Share.

An amount of Rs. 487.289 lakh including MORD share of Rs.165.086 lakh and CSB share of Rs. 295.78 lakh has been released under the project till the year 2010-11. Apart from the above, Rs. 26.41 lakh is also released towards administrative assistance to NGO for project implementation in Udham Singh Nagar. Credit amounting to Rs. 35.49 lakh and beneficiary share of Rs. 32.63 lakh has been mobilized to implement the project activities. The progress achieved under the project is as follows:

- 50 vermi-compost sheds were constructed and started functioning. These units have produced 50.1 MT of vermin-compost during 2010-11. A total of 111.66 MT of vermi-compost has been produced and applied to mulberry plantation under the project since inception.
- Tree mulberry plantations in 124 units of ½ an acre each were raised during the year. A total of 974 units of ½ an acre tree type plantation and 26 units of bush plantations using S-146 variety of Mulberry have been raised in Nainital and Udham Singh Nagar districts. Plantation targets have been achieved in full.
- Physical verification of plantations was conducted. A total of 1.02 lakh saplings were used for gap filling during the year to improve the survival percentage in the plantation raised during 2007-08, 2008-09 and 2009-10 to maintain desired number of trees/plants per Swarozgaris.
- Two CRCs have been established at Bichapuri and Nathunagar. Work order has been placed for civil works of CRC at Chanakpur. Proposal for transferring Govt. land to DOS, Uttarakhand to establish two CRCs has been submitted to Administrative authorities of Govt. of Uttarakhand. Also

Lease Deed with landholders (SHGs) is in final stage for establishing the remaining CRCs.

- Since inception 851 applications were submitted to Bank for credit against the project target of 1000 units for construction of rearing house and rearing appliances. Loan is sanctioned to 524 Swarozgaris of which 475 Swarozgaris have completed construction of rearing houses. Rearing houses of 49 Swarozgaris are under different stages of construction.
- 467 Swarozgaris who have been granted loan were supplied rearing appliances and used for trail silkworm rearing.
- Trial Silkworm rearing of 41000 dfls was taken up during 1010-11 to utilize the mulberry plantations raised during 2007-08 & 2008-09. A total of 11.83 MT cocoons were produced during 2010-11 and 17.22 MT cocoons since inception in the project areas.
- One Bankers meet was organised to facilitate and expedite credit to the project beneficiaries.
- One Insurance workshop was organised to bring awareness among the officials of Project Implementing Agencies and Insurance Agencies.
- 134 farmers were trained in plantation maintenance and silkworm rearing techniques during the year. A total of 1000 Swarozgaris were trained since inception covering the project target in full.
- 123 farmers were given exposure on Sericulture practices in Himachal Pradesh and Bangalore. Since inception, 314 Swarozgaris have been covered for exposure visit.
- 4 Krishi melas were organised at Pavalgarh, Kotbag, Sarvarnagar and Chankpur villages during the year and a total of 8 Krishi melas were organised under the project since inception. The project is under progress.

● Sericulture Projects

Projects with assistance under Catalytic Development Programme (CDP)

1. Micro Project for Development of Oak Tasar in Manipur - (Phase-II)

The second phase of "Micro Project for Development of Oak Tasar in Manipur" was initiated in the year 2007-08 for a period of five years coinciding with XI Plan period at a total cost of Rs.387.368 lakh with CSB, State and Beneficiary sharing @ Rs.227.421, Rs.64.203 and Rs.87.429 lakh, respectively and the balance is credit from financial institutions. The project is being implemented by Manipur State Sericulture Cooperative Federation Ltd., (MSSCF) from 2007-08. CSB has released its share of Rs.156.362 lakh under CDP Schemes.

The progress achieved under the project is as follows:

- 300 ha of oak plantations have been raised and maintained since inception. 150 seed rearers were supported with rearing equipment.
- During the year 10-11, a total of 0.2 lakh basic seed dfls were reared and 5.3 lakh seed cocoon were harvested. Since inception of the project, a total of 1.28 lakh basic seed dfls were reared and a total of 29.5 lakh seed cocoons harvested.
- A total of 5.3 lakh seed cocoons were processed to produce 61,690 dfls by 4 Oak tasar farm-cum-grainages strengthened under the project. Since inception of the project, a total of 29.5 lakh seed cocoons were processed and 2.39 lakh dfls were produced.
- A total of 0.62 lakh commercial dfls were reared during the year 2010-11 and 17.42 lakh cocoons were harvested. Since inception of the project, a total of 3.01 lakh commercial dfls were reared and a total of 68.81 lakh cocoons harvested.

- One warehouse for Oak Tasar Cocoon & Yarn marketing was established. Also one CFC was established with 5 Reeling-cum-Twisting machines, 12 Spinning machines and 27 certified improved looms. A total of 250 kg reeled silk and 1150 kgs of spun silk produced.
- 300 commercial farmers, 150 seed rearers, 5 reelers, 12 spinners and 30 weavers have been trained. Apart from this, two farmers' day were also organized and 47 farmers were on study tour to expose them to advanced practices.

The project is under progress.

Micro Project for development of Oak Tasar in Mizoram

A Micro Project for Development of Oak Tasar in Mizoram was initiated with a total cost of Rs.94.682 lakh with CSB, State and Beneficiary sharing @ Rs.71.542, Rs.18.746 and Rs.2.225 lakh, respectively along with a credit of Rs.2.168 lakh. The project is being implemented in Tlamsam, Zotlang and Zote villages of Champai district during 2008-09 to 2011-12 by DOS, Govt. of Mizoram, coinciding with XI Plan period.

CSB has released its share of Rs.32.826 lakh under CDP Scheme. The project progress is as follows:

- 10 beneficiaries supported for raising and maintenance of new plantation and maintenance.
- 52 commercial rearers supported for rearing equipments.
- Strengthened one Oak Tasar farm cum grainage for production and supply of commercial dfls.
- Six nos. of Cocoon storage houses constructed for storage of cocoons and one Community Reeling & Spinning Centre was established with support for 20 motorized reeling machines and 8 spinning machines.

- 52 commercial farmers, 20 Reelers and 8 spinners trained.
- Two farmers day were organised and 30 beneficiaries were taken on study tours.

The project is under progress.

Income enhancement of Rural poor through Ericulture in Gujarat

A project on Income enhancement of Rural Poor through Ericulture with a total cost of Rs.296.607 lakh has been initiated for a period of four years from 2008-09 to 2011-12. The project cost includes Central Share of Rs.176.076 lakh from the funds available under the Catalytic Development Programmes of CSB. The State matching share of Rs.72.788 lakh would be met by the Department of Cottage and Rural Industries (DCRI), Govt. of Gujarat and Rs.47.743 lakh to be borne by the beneficiaries. The project is being implemented in clusters in the districts of Mehsana, Patan, Banaskantha & Sabrakantha of North Gujarat during the 2008-09 to 2011-12 by Department of Cottage & Rural Industries, Govt. of Gujarat, Gandhinagar. CSB has released Rs. 31.573 lakh towards its share under CDP.

The progress of the project is as follows:

- 230 farmers trained in Eri silkworm rearing and cocoon production.
- 5 days spinning training has also been organised at three places, i.e. Jawraj, Zarda and Odd by Zonal Office of CSTRI, CSB, Bilaspur.
- A total of 1200 dfls were reared during training producing 424.6 Kg cocoons.
- Carried out several group demonstrations, and video shows to generate awareness about Ericulture in the selected clusters.
- Produced 28,622 eri dfls from the cocoons under the programme and supplied to Andhra Pradesh, Gujarat, Punjab, Uttar Pradesh, Orissa and Chhattisgarh.

The project is under progress.

Integrated Tribal Development Programme for Chakai Block of Jamui District of Bihar

The project is being implemented in tribal dominated *Dulampur, Nauwadih, Faritazadihi and Gajhi* panchayats of *Chakai Block of Jamui* by creating Tasar Sericulture based forward and backward linkages for sustainable livelihood development. Total outlay of the project is Rs. 1274.91 lakhs, of which NABARD, Patna is funding Rs.837.72 lakhs (65.71%), CSB share of Rs.170.91 lakhs (13.41%), Beneficiary share is Rs. 217.29 lakhs (17.04%) and Loan from NABARD amounts to Rs. 49.00 lakhs (3.84%), for a period of five years starting 2009-10 with CDP funding proposed only for the XI Plan period i.e., 2009-10, 10-11 and 11-12 at Rs. 20.675 lakhs, Rs. 86.517 lakhs and Rs. 63.717 lakhs, respectively.

It is proposed to raise tasar host plants in 3000 acres covering 1500 farmers, establish 50 private graineurs, assist 100 reelers and spinners in tasar sector. It is also proposed to create water harvesting structures and common amenities viz., cocoon godown, CFC buildings with storage & stifling facilities, pumpsets, sprayers and weeders, which would also help the farmers in raising mango orchards, goat rearing, paddy and vegetable cultivation.

For better value addition, all the linkages from plantation, rearing, seed preparation to reeling/spinning with project assistance towards common facilities for storage and processing, institution building, health and sanitation besides health insurance, building of community assets viz., pumpsets, sprayers, weeders, capacity building/training of stake holders, village level Community Resource Persons (CRP), women development through setting up seri-clinics is proposed.

While NABARD has released Rs. 241.34 lakhs, CSB has released Rs.106.175 lakhs to PRADAN being the CDP share for the years 2009-

10 (Rs. 20.675 lakhs) and 2010-11 (Rs. 85.50 lakhs), of which Rs. 17,46,292/- has been utilized.

Under Tasar sector, 418.4 acres of tasar host plants have been raised in 10 villages with cattle proof trenches, soil conservation works carried out in 239.86 acres and 20 Water harvesting structures have been raised. 6 pumpsets, 12 sprayers and 75 weeders have been provided to take care of intercultural operation in sericulture and horticulture activities. 20 SHGs were formed, 4 group accountant trainings and one batch of project implementing agency staff training were organized during the year. 191 rearers, 3 batches of farmers in nursery raising, 5 batches in vegetable cultivation and 5 batches in SRI/ Improved paddy cultivation were trained during the year. 20 beneficiaries were covered under exposure visit. Potato cultivation under irrigated conditions for the first time in the area and vegetable cultivation in the summer in some villages. SRI technique has lead to harvest of 2-3 times more paddy in Chakai, practiced by about 400 families. In addition to the above, horticulture activities with mango plantation was also taken up in the project area with totally NABARD funding.

Integrated Tribal Development Programme for Banka District of Bihar

The project is being implemented in tribal dominated Katoria, Chandan and Bounsi blocks of Banka district through WADI approach (Agri-Horti-Forestry). Total outlay of the project is Rs.675.91 lakhs, of which NABARD, Patna is funding Rs.512.33 lakhs (75.8%), fund dovetailed from SGSY share of Rs.31.14 lakhs (4.61%), Beneficiary share is Rs.117.44 lakhs (17.37%) and Loan from NABARD amounts to Rs.15 lakhs (2.22%), for a period of seven years starting 2008-09, respectively. It is proposed to raise tasar host plants in 900 acres covering 1500 farmers @ 0.6 acres, establish one basic seed production unit under private sector, assist to establish one cocoon bank and hot air dryer each besides create water/soil

conservation structures, which would also help the farmers in raising mango orchards, goat rearing, paddy and vegetable cultivation.

Under the project, of Rs. 176.527 lakhs released by NABARD, Rs. 87.67 lakhs have been utilised as on date of report. 900 families are covered in 85 groups under the project with soil conservation measures (30' x 40' model) and cattle proof trenches, 27 pumpsets and 36 sprayers are supplied, besides conducting exposure visit for implementing staff, 596 beneficiaries and 77 participant training.

Implementation of Crop Insurance Scheme

Crop Insurance scheme covering all the four sectors, Mulberry, Tasar, Muga and Eri. is being implemented in different sericulture states under Catalytic Development Programmes. The details of the scheme are as follows:

Sl. No.	Sector	Sum assured for 100 dfls (in Rs.)	Premium (% of Sum assured)
1.	Mulberry : Multivoltine Pure	4700	7%
	Mulberry:Multivoltine Hybrid	4700	7%
	Mulberry: Bivoltine (P / Hy)	5787	8%
2.	Tasar / Oak Tasar : 1st Crop	1888	10%
	Tasar / Oak Tasar : 2 nd Crop	2038	10%
	Tasar / Oak Tasar : 3 rd Crop	2188	10%
3.	Muga	1910	5%
4.	Eri	1570	5%
	Rearing House	Assessed Value	0.5%
	Rearing/Reeling/Weaving equipment	Assessed Value	0.4%
	For the beneficiary and his family (Three persons)	50000 each	Rs. 50.00

During the 2011-12, three states namely, Tamil Nadu, Jharkhand and West Bengal have implemented the scheme for all sectors and components. A total of Rs. 60.20 lakh dfls were covered under crop insurance and assistance amounting to Rs. 93.135 lakh was disbursed under CDP to the states as per details given below :

Status on Crop Insurance during 2010-11

[in lakh Rs.]

Sl.No.	State	Year	Sector	Physical	Total Premium
1	West Bengal	2010-11	All		5.699
			Dfls (Lakh no.)	7.07	
2	Jharkhand	2010-11	Tasar		75.556
			Benef	23567	
			Dfls (Lakh Nos.)	47.13	
3	Tamilnadu	2010-11	Mulberry		11.88
			Benef	5000	
			Dfls (Lakh Nos.)	6.0	
	Total				93.135

Since inception of the XI Plan period, a total of 96.20 lakh dfls (all sectors and all components) were covered with CSB share of Rs.145.76 lakh towards premium.



**RESEARCH & DEVELOPMENT
AND EXTENSION**

- **Highlights of R&D Activities in Central Silk Board's Research Institutes:**

- A. Mulberry Sector**

- Central Sericultural Research and Training Institute, Mysore**

The Institute has its hinterland in all the four Southern States apart from Maharashtra, Madhya Pradesh, Gujarat and Rajasthan. Nested under it are 4 Regional Sericultural Research Stations (RSRSs) at Ananthapur, Chamarajanagar, Kodathi and Salem, 18 Research Extension Centres (RECs) at Bidaraguppe, Chitradurga, Krishnagiri, Madivala, Rayachoti, Amrawati, Baramati, Samayanallur, Vikarabad, Angamaly, Venkatagiri-Kota, Udumalpet, Madakasira, Gobichetty-palayam, Hosur, Agali, Nagpur and Hosangabad with 12 Sub-units at Bidar, Kinakanahalli, Shimoga, Koppal, Mugur, Eluru, Kanakapura, Maddur, Penukonda, Attappadi, Neyeli and Aurangabad and one Satellite Silkworm Breeding Station (SSBS) at Coonoor. The major research findings are as below:

- Mulberry Crop Improvement, Production, protection**

The Final Yield Evaluation [FYE] of promising genotypes short-listed after screening and evaluation under Primary yield evaluation was continued. Two genotypes Gen.3 and Gen.8 superior over check variety (RC-1 and V-1) under sub-optimal and optimal conditions of irrigation by 16-28 % were identified. One triploid each out yielding both the National check [S1635] by 17 % and the respective regional checks [S13 / V-1], under soil moisture stress and non-stress conditions by 19 and 37.5 % were identified respectively. Eleven lines of transgenic mulberry with HVA1 gene was subjected to hardening and multiplied. Recorded data on morphological, physiological and bio-chemical parameters and identified two lines ST11 and ST46 tolerating stress up to 60 days without watering. Under the development of mulberry transgenic plants, leaf

explants tissue of V-1 genotype were co-cultivated with the *Agrobacterium* (EHA105) strain harbouring the binary construct (pB1121) carrying (i) *SHN1* and *DREB2A* genes under 35 S promoter and (ii) *DREB2A* and *SHN1* genes under Rd 29A and Cer 6 promoters, respectively. The co-cultivated leaf explants tissue was thoroughly washed and dried and transferred to selection media containing Kanamycin (50 mg/l) and Cephataxime (300mg/l). Survivability range was between 20 – 30% on selection media, compared to 60-80 % survival in control. Tissues of putative transgenic (22 Nos) plants were supplied to the collaborator – UAS (B) for confirmation by PCR method. The PCR results have confirmed the transgenics. About 1065 germplasm accessions in the field gene bank at CSGRC, Hosur along with important morphological traits were listed for diversity analysis and short-listing (along with available molecular data). Based on passport and diversity analysis of morphological data, 500 unique germplasm accessions were identified for multiplication in the nursery and for SSR marker analysis. Designed primers (F/R) for 21 SSR repeat motifs from the EST sequences in the NCBI database.

Five promising mulberry varieties were evaluated to find out the importance of different treatments *viz.*, organic nutrients, combined effect of organic and inorganic nutrients. Three crop data revealed RC1 and S13 varieties to be more responsive to organic application with higher leaf yield. Biofuel (briquettes) developed from seriwaste recorded good physical, combustion characteristics with high thermal value. Ash produced after combustion was nutritionally rich and could be used as a good soil conditioner. Towards isolation of rhizosphere phosphate solubilizing bacteria under *in vitro* using standard methods, 3 strains of bacteria showed P solubilization activity in PVK media containing 50 g/ITCP. The solubilization of TCP started after 24 hr and

reached maximum in 5 days. Strain- 1 showed maximum PSE value (144) followed by strain-2 (142) and strain-3 (140). Study on long term effect of fertilizers and manures on soil, two crop data showed highest leaf yield in T7 (350:140:140 kg/ha/yr with 20MT/ha/yr i.e., 35.80 in K2, 43.50 in S36 & V1-53.50 MT/ha/yr and lowest in T0 (Absolute control i.e., K2-11.80, S36-14.80 and V1-15.90). The micro-nutrient content in soil varied between different treatments and variety; zinc ranged between 0.35 to 1.30 ppm; copper 0.15 to 0.50 ppm; iron 8.20 – 13.00 and manganese 6.20 to 13.00 ppm. Poshan a multi-nutrient formulation was tested in farmer's gardens. Results indicated an increase of 25 % leaf yield in treated plots than control. Biochemical analysis indicated an increase of 18 to 23 % in total carbohydrates, proteins and total chlorophyll in treated leaf samples over control.

Under anaerobic condition, *Pleurotus florida* along with SSP, lime powder, sugarcane bagasse was found effective to decompose the mulberry shoot upto 92% within 150 days. Chemical analysis of the decomposed mulberry shoot showed pH: 7.47; EC: <1.0; OC: 3.06%; N: 0.29%; P: 0.22% and K: 0.32%. Evaluation of mushroom compost on the soil fertility and leaf productivity revealed improvement of soil health by enhancing soil properties, survival (16%) and growth (19%) over the control. Deep digging (up to 30 cm) along with application of neem oil cake (@ 800 kg/ha after 2 months) and raising of Dhaincha crop (@ 20 kg seeds/ ha after 15 days) was found effective to suppress (98.0 %) soil borne fungal pathogens and nematodes causing nursery, root rot and root knot diseases. For identification of QTLs conferring resistance to mulberry root rot disease, three bacteria and 4 fungi were isolated and purified by streak/ mono hyphal tip methods. The bacterial isolates were found non-pathogenic. Fungal isolate, *Rhizoctonia bataticola* (= *Macrophomina phaseolina*) was found

pathogenic. The other isolates, *F. solani*, *F. oxysporum* and *B. theobromae* were found to cause secondary infection on roots. Soil temperature >25° C, poor organic carbon < 0.3 %, soil moisture < 30 % and sandy soil enhanced the disease severity. A new formulation composed of plant derivatives (80%), organic (8%) and inorganic (12%) chemical compounds were applied in hot spot areas (farmers' field) at Kanakapura and Malavalli. Disease suppression >90% was achieved within 30 days. For management of soil borne diseases of mulberry using bio-fumigants, seven plants were raised and *in vitro* screening was conducted against pathogens of root rot disease. Two plants belonging to Brassicaceae viz; *Brassica juncea*, *Raphanus sativus* and mustard oil cake arrested growth of pathogen completely. The mustard oil cake and mustard plant residue were found effective for control of root rot disease under *in vivo* conditions.

Silkworm Crop Improvement, Production, Protection

Nine productive breeds (CSR2, CSR3, CSR4, CSR6, CSR12, CSR16, CSR17, CSR26 and CSR27) and thirteen robust breeds (CSR18, CSR19, CSR46, CSR47, CSR50, CSR51, CSR52, CSR53, D2, D20, NB1, S8 and S9) were reared following the race maintenance procedures. The performance of the breeds was in conformity with the original breed characteristics. Thin denier breeds, JPN7 and JPN8 were maintained by following the mono cocoon reeling technique. Both the pure breeds were bred true for the target traits viz., filament length and denier. The performance of the breeds was in conformity with the original breed characteristics. The cocoon colour sex-limited breeds namely, CSR2 (SL), CSR4 (SL), CSR8 (SL) and CSR 202 (SL) were reared following the race maintenance procedures. During the course of maintenance of sex-limited breeds, the batches expressing higher survival in

females with cocoon weight, shell weight and cocoon shell percentage on par with bench mark values were selected. The performance of the breeds was in conformity with the original breed characteristics. All the productive, robust and sex limited breeds were subjected to post-cocoon assessment. The important post-cocoon parameters such as filament length, raw silk percentage, reelability, denier and neatness were assessed. The productive breeds expressed higher raw silk percentage and neatness when compared with the robust and sex limited breeds. To study the performance of double hybrid (CSR50 x CSR52) x (CSR53 x CSR51), the parental breeds viz., CSR50, CSR52 (oval), CSR53, CSR51 (dumbbell) and the foundation crosses namely CSR50 x CSR52 (oval FC) and CSR53 x CSR51 (dumbbell FC) were evaluated. The egg production aspects of the parental breeds and foundation crosses were studied. The double hybrid recorded egg recovery of 87.8 g/kg of Cocoons and an average cocoon yield of 70.1 kg/100 dfls.

Twenty, three way cross hybrids were evaluated and six three-way hybrids were short-listed. These hybrids recorded pupation > 95%, shell% > 22, filament length (m) of >1200, raw silk of > 19% and neatness of >94 points. Selected batches of bivoltine breeds' viz., Fec14 (CSR2 SL), Fec56 (CSR2) and Fec78 (CSR4), Fec9 (CSR6), Fec10 (S5) and Fec11 (D13) were subjected to directional selection for higher pupation rate (%) and egg number by crossing high pupal weight females with high cocoon shell percentage males from G1 to G10. The breeds meant for higher fecundity have recorded an improvement of 5.29% in fecundity as compared to their controls. Ten promising polyvoltine parents were selected and used as breeding resource material. Ten breeding plans were initiated and 16 lines were identified. Mid-way hybrid evaluation was conducted at F10 generation of which 10 lines were short-listed. After hybrid evaluation only 6

lines were retained and continued. Further, at F14 generation, hybrid evaluation was conducted and two promising polyvoltine x bivoltine hybrids - L14 x CSR2 and L15 x CSR2 were identified. Identified hybrids are further evaluated in the laboratory and also at TVDC. Presently the breeding lines are at F19. Pupation in the new hybrids range from 96.67 – 97.3%; Yld/10000 larvae (by Wt.) range from 18.725 to 18.798 kg; Cocoon wt. 1.945 – 1.955g; Shell wt. 0.400 to 0.419 g; and Cocoon Shell % 20.60 to 21.43; Filament length ranged from 990 to 995 m; RS % 16.24 to 16.65 %; neatness 91 points and Raw silk % from 16.24 to 16.65 % with a quality silk of 2A Grade. Grainage parameters have been studied in promising breeds L14 & L15. New hybrids L14 x CSR2 & L15 x CSR2 have been evaluated under large scale testing at TVDC. During the period two On Station Trials have been conducted at three RSRs (Ananthapur, Kodathi and Salem). Eighty one hybrid combinations involving 7 bivoltine breeds & 2 FCs viz., CSR2, CSR4, CSR6, CSR26, CSR27, CSR50, CSR51, CSR2 x CSR27, CSR6 x CSR26 and 9 polyvoltine breeds viz., ND7, ND5, NP1, NDV6, AGL3, AGL5, L14, L15 and PM have been evaluated in the laboratory. One hybrid evaluation trial has been completed during summer, March-April 2010. Evaluation indices have been calculated for all the 81 combinations using Mano's EI. 47 hybrids have recorded > 50 EI values. Following are the top ranking hybrids based on first trials results: 1. L14 x CSR2, 2. L15 x CSR2, 3. L14 x CSR50, 4. L15 x (CSR2 x CSR27) and 5. AGL3 x CSR26. 2nd trial evaluation involving 110 hybrids is under progress. Single and double hybrids with high amylase activity as well as tolerance to high temperature (36°C) and high humidity (85% R.H.) conditions were identified. In-house testing at TVDC and On-station trials at RSR units have indicated the superiority of the single hybrid, 2C x 4S and double hybrid, G11 x G19 over the controls in terms of higher survival and pre/post-cocoon traits. Twenty silkworm breeds developed through amylase

marker assisted selection, 6 recurrent parents, 15 NPV tolerant breeds and 35 mutant stocks were reared and maintained conforming to their respective breed characters. Inheritance analysis of bimodal emergence has been analyzed under three trials. Amplified products of two SNP primers showed linkage with 4 band and 5 band cathodic amylase genes of PM and Nistari. Two primers of 21st linkage group showed close association with cocoon traits. Parents have been selected and BmIFV pathogen has been multiplied and purified. DNA has been extracted from the parents. Genomic DNA from F1, F2 and BC progeny is being screened with RAPD primers.

Twenty-one bivoltine and twelve multivoltine artificial diet breeds are being maintained as breeders stock for original breed characters. Four trials of muga diet rearing conducted at CMERTI, Jorhat and two trials at CSRTI, Mysore. 87.26% average feed response was recorded. 85.75% larvae successfully passed second moult. Maximum weight recorded on diet for the first instar larvae was 0.4325g and for second instar larvae 1.4208g. Patent is filed for Muga diet. A field trial-cum-demonstration for both Tasar and Eri diet chawki rearing was conducted in co-ordination with DOS, Chhattisgarh. Significantly higher ($p < 0.001$) shell weight (0.486g) and shell percentage (14.21) was recorded in diet reared Eri cocoons compared to leaf-reared batch (0.398g & 11.92%). In Tasar diet rearing, no significant difference was recorded in all rearing parameters except in cocoon yield, where the diet reared ones showed significantly higher ($p < 0.001$) cocoon yield (1300 cocoons) compared to leaf reared (1015 cocoons) under control. Pink natural colour fabric has been tested through Textile Committee and CSTRI, Bangalore for colour fastness and fabric properties respectively. It was found that colour fastness was good to excellent in all respects except colour fastness to light. Colour fabric properties are at par with normal silk fabric (dyed). Silkworm pure

aces viz., L13, L14, L15, ND7, PM, Gen2, Gen3, CSR16, CSR17, CSR50, CSR51 were reared on large scale and rearing packages are being developed. Two trials of bivoltine double hybrid (CSR2xCSR50) x (CSR51xCSR26) evaluation with control (CSR2xCSR27) x (CSR6xCSR26) were conducted with a total of 432 dfls. The average of two trails recorded a cocoon yield of 89.07 kg/100 dfls, ERR of 94.36% as against 78.76 kg and 92.84% with an improvement of 13.09% and 1.63%, respectively in the control hybrid. The new hybrid showed an improvement of 1.98 in the shell percent over the control. Three trials of L14 x CSR2 hybrid recorded a cocoon yield of 62.24 kg/100dfls and ERR of 86.08% as against 62.269 Kg that is not significant over the control PM x CSR2. However, Shell % of the new hybrid showed an improvement of 12.85% over the control. Two trials of the L15 x CSR2 hybrid recorded a cocoon yield of 52.255 kg/100dfls which is non-significant over the control. But the shell % showed an improvement of 8.11% over the control. Two trials of L4 x CSR2 hybrid recorded a cocoon yield of 67.635 kg/100dfls with an improvement of 8.62% over the control. The shell % showed an improvement of 5.97% over the control.

Selected breeds were tested for their tolerance against BmIFV infection and breeds 5N and 51N were found tolerant and CSR2 as susceptible. The hybrids viz. 5N x CSR2 and CSR2 x 5N were also inoculated with BmIFV and estimated their tolerance towards the pathogen. The impact of new microsporidian spore isolated from the silkworm rearings of P3 BSF Mysore on silkworm larval health and cocoon characters was studied. The larval and cocoon characters were not affected by the infection of silkworm with microsporidian spore at the concentration of 1×10^3 to 1×10^6 spores /ml. The pathogenecity studies of the new microsporidian in two successive generations were completed. The layings laid by female moths having infection upto 5 spores/field

and 100 spore/field (600 × magnification) were allowed to rear. The infection resulted in 2% and 3.33% mortality in larval/pupal stages. At moth stage no moth was found infected at 5-spores/field infections whereas, 83.66% infection was resulted in 100-spores/field infections. To popularize biological control of sericultural pests, 10,500 *Cryptolaemus* and 1,16,750 *Scymnus* beetles were supplied to sericulturists of Karnataka, Tamil Nadu and Andhra Pradesh for the control of tukra in mulberry covering 275 acres. To reduce the incidence of Uzi fly, 92.7 lakh (927 packets) of *N. thymus* were supplied to the sericulturists of Karnataka, Tamil Nadu, Andhra Pradesh and Maharashtra covering 46,350 layings. Under the collaborative programme with TNAU and NBAIL, 3 exotic parasitoids of Papaya mealy bug viz, *Anagyrus loecki*, *Acerophagus papayae* & *Pseudleptomastix mexicana* were imported from USDA during August 2010 and developed a classical biological control for management of Papaya mealy bug. A total of 15,100 adults of *Acerophagus papayae* parasitoids under classical biological control programme were released in papaya mealy bug infested mulberry gardens of 25 farmers in Tamil Nadu and 34 farmers in Karnataka. After the release of parasitoids, the infestation reduced from 10-80% to less than 2% resulting in more than 90% suppression. Since 5 years, continuous release

of lady bird beetles in 70 acres of mulberry garden & *N. thymus* in rearing houses at CSRTI, Mysore was able to keep the incidence of tukra & uzi fly below 5% level without the application of any chemical/insecticide. The incidence of minor pests such as white fly, thrips & mites was monitored and awareness cum demonstration programmes were conducted in hot spot areas of Mandya and Kanakapura. Under studies on forecasting & forewarning for mulberry pests, diseases and silkworm pest, incidence of pests and diseases of mulberry is being recorded at selected mulberry gardens in seven different locations (Karnataka 3; Tamil Nadu: 2; Andhra Pradesh: 2) on fortnightly basis and data compilation is under progress.

Training Division

Human Resource Development

In collaboration with JICA, two International training programmes were organized for the participants from Third world countries viz., Kenya, Nigeria, Uganda, Ghana, Madagascar, Nepal, Kyrgysthan etc.

Based on the requests received from Universities, Department of Sericulture, NGOs etc., need-based training programmes were organized. In addition to this students from various universities/colleges were supported for the M.Sc., project/ dissertation works.

SI. No.	Programme	Persons (in No.)
1	Persons trained under various training programmes	815
2	Enterprise Promotion and Training under XI plan of CSS	265
3	Certificate Course	55
4	Number trained under ad-hoc programmes	98
5	Third country training programme	28
6	Need-based training programme	430
7	Under CSS-2109 farmers trained by different RSRs	5440

Sericulture Extension Economics and Management Division (SEEM)

Cluster Promotion Programme (CPP) is implemented in 22 identified clusters in Karnataka, Andhra Pradesh, Tamil Nadu and Maharashtra in co-ordination with respective Departments of Sericulture for the promotion of bivoltine sericulture in the country. The clusters are supported with Chawki Rearing Centres (CRCs), Farmers' Field Schools (FFSs), Seri-polyclinic and biological control agent multiplication units for supporting the farmers for successful harvest of bivoltine crops. A total of 32,54,783 dfls of bivoltine hybrids were distributed under CPP to 15,471 farmers and an average cocoon yield of 64.42 kg/100 dfls were harvested. A total of 1,05,600 dfls of bivoltine hybrids were chawki reared in the model CRC of Institute and supplied to 374 adopted farmers of CSRTI, Mysore. An average cocoon yield of 68.69 kg/100 dfls was recorded. For effective transfer of technologies, Video Conferencing was initiated in co-ordination with University of Agricultural Sciences, Bangalore. Four sessions were conducted with participation of farmers from different regions of Karnataka. Technical guidance/solutions were provided to 81 farmers through Farmers Advisory Center (FAC). 193 farmers utilized IVRS (Interactive Voice Response System) facility for getting information on various aspects of sericulture. Awareness regarding general sericulture and sericulture technologies were provided to 3,593 farmers, 1,484 students, 370 trainees and 97 persons from different countries during their visit to CSRTI, Mysore. Organized a Farmers' workshop at Belgaum on 5.01.2011. More than 1000 farmers participated in the workshop.

Patent & Commercialization

Patent filed

1. A diet for rearing young instar muga silkworm and a process for preparation there of (JPR/4.11.13/10055/2010)

2. Development of sericin extraction process from sericin rich bivoltine silkworm hybrid cocoon shell (Pat/4.4.4/09103/2010)
3. Navinya - A bio-formulation for control of mulberry root rot disease (IPR 4.25.14.10079)

Patents obtained

1. Semi synthetic diet for rearing of young instar tropical tasar silkworm, *Antheraea mylitta* (Pat.No.240259/30.4.2010)

Progress of RSRs

RSRS Ananthapur

During 2010-11, 3 trials (May-June, July-August and October-November) were conducted. The rearing performance of two hybrids, L14 x CSR2 and L15 x CSR2 and PM x CSR2 (control) showed that there are improvement in cocoon weight (1.6 g) compared to control (1.5 g), similarly shell wt. was 0.316, 0.317g respectively compared to control (0.295g). Shell % was 18.76 in control hybrid as against 19.35 and 19.55% in test hybrids. The performance of the multi x bi hybrids on the average of three trials indicated that L14 x CSR2 and L15 x CSR2 recorded significantly higher cocoon and shell weights and SR% compared to PM x CSR2 (Control). The reeling parameters are superior in L14 x CSR2 followed by L15 x CSR2 compared to PM x CSR2 control.

Three rearing trials were conducted during 2010-11 (August-September, November-December and January-February, 2011) with three hybrids, FC1 x FC2, 2C x 4S, G11 x G19 and CSR2 x CSR4 (control). The performance of double hybrid G11 x G19 recorded higher ERR (8936) and shell % (23.01) compared to FC1 x FC2 (8872 & 22.17) control. The single hybrid 2C x 4S recorded higher ERR (No - 8954 and wt. - 16.045 kg) and shell wt. compared to CSR2 x CSR4. The reeling parameters are superior in G11 x G19 compared to FC1 x FC2. Similarly 2C x 4S is superior compared to CSR2 x CSR4.

Induction of wide adaptability of authorized bivoltine breeds to produce sustainable cocoon yield one on-station trial was conducted during August-September, 2010. The rearing performance of two pure races, showed that ERR by No. & wt. are 8532, 13.91 kg and 8564, 12.76 kg in CSR2 and CSR4, respectively. The cocoon weight, shell weight and shell % were 1.632g, 0.342 g and 20.95g for CSR2 breed and 1.491 g, 0.306 and 20.52g in CSR4 breed, respectively.

For final yield trial evaluation under non-stress conditions, 5-mulberry genotypes viz., 4, 7, 14, 17 and 22 along with check V-1 and for evaluation under stress condition, 5 genotypes 16, 17, 26, 31 and 33 along with check S13 were selected. These mulberry genotypes each for non-stress and stress were planted in RBD with 4 replications under 90 x 90 cm spacing on 17.7.2008. After the establishment of the experimental plots, four crops data were recorded for non-stress condition and two crop data for stress condition on morphological growth yield parameters, leaf moisture and moisture retention capacity. The average data of three crops under non-stress conditions indicated that genotypes 7 and 14 are superior over check V1 and other genotypes. The average data of one crop under stress conditions indicated that genotypes 26 and 33 are superior over check S13 and other genotypes. A quantity of 3,776 kg leaf (7,552 shoot) was supplied for 325 dfls of experimental/general rearings. 22,522 kg of shoot was supplied to rear 775 dfls (450 dfls General + 325 dfls OFT). 15,000 kg of shoot was utilized for compost/vermicompost preparation. Thus, a total quantity of 37,522 kg of shoot was utilized for rearings and compost/vermicompost preparation. 109 soil samples were analyzed for pH, EC, Organic carbon, available phosphorus and available potash and recommended the manures/ fertilizers to the farmers accordingly. 15 MT of mulberry shoot, 6 MT of green manure and 4 MT of Seri / farm

residue was utilized for compost/vermicompost preparation, a quantity of 5 MT of compost and 4.10 MT of vermincompost harvested and applied to experimental/general plots.

For fabrication of 4 types of Thread –Frame mountages and testing for efficacy of silkworm cocooning two trials were completed and the data was presented in 49th and 50th Research Council meeting held at CSRTI, Mysore. As per the suggestions of RC, modifications are made and being tested. Under Race Authorization programme different multi hybrids (9 combinations) and biv. hybrids (8 combinations) are reared during Feb-Mar, 2011. The cocoons were reeled and analysed. During the year 2010-11, in addition to OST/RAP rearings a quantity of 546 (206 dfls PM x CSR2, 200 dfls CSR2 x CSR4, 50 dfls L15 x CSR2 and 70 dfls G19 x G11) was reared and harvested and an average yield of 58.0 kg/100 dfls and total revenue earned including farm rearings upto March 2011 is Rs. 54,962/-.

RSRS, Chamarajanagar

On farm trial of RC₁, RC₂ and AR₁₂ was taken up at farmers' plot at Kelasurpura village of Gundulpet taluk. Leaf yield data of two crops indicated that, RC₁ variety recorded highest leaf yield / plant (361 g / plant.) followed by AR₁₂ with 303 g/ plant. and RC₂ with 258 g/plant while K₂ recorded 118 g /plant. It is proposed in the annual action plan of 2011-12 to take up plantation with one more farmer by utilizing the saplings raised at RSRS farm.

Six farmers from six villages having V-1 mulberry garden in IJ system under irrigated conditions were selected to carryout Integrated nutrient management as TOT programme. The inputs like biofertilizers (Seri-Azo & Seri-Phos) and seriboost (growth promoter with micronutrients) were supplied. The harvest data showed a leaf yield range between 38.7 MT - 60.3 MT/ha/yr. Five crops harvest data of RSRS farm, recorded an

average leaf yield of 58.5 MT/ha/yr under INM and 54.8 MT/ha/yr in control plot.

During the period, three trials were conducted. The pooled data of three trials indicated better performance of new double hybrid G11 x G8 in comparison to control hybrid (FC1 x FC2). The pooled data of three trials indicated that the new single hybrid 2C X 4S has shown higher yield and superior cocoon characters in comparison to control hybrid. Primary yield evaluation of mulberry genotypes under stress condition indicated that, from a total of three crops genotype 7 yielded highest leaf yield of 13150 kg/ha followed by 17 and 6 with 12954 and 12085 kg/ha and check variety (S₁₃) yielded 11905 kg/ha. Under non-stress condition, a total of three crops indicated that genotype 7 recorded maximum leaf yield of 26446 kg / ha followed by genotype 22 and 4 with 24874 and 23612 kg/ha respectively and check variety (V₁) yielded 18328 kg/ha. On-farm trial at farmers field under moisture stress condition indicated that, the variety RC₁ recorded the highest leaf yield of 361 g/plant followed by AR₁₂ and RC₂ with 303 and 258 g/plant respectively and check variety (K2) yielded 118 g/plant.

A total of 29050 *A.papayae* were released at 192.5 acres of farmer's garden for control of papaya mealy bug infestation. A total of 15.83 lakh of *N.Thymus* were produced and released during farmers rearing for control of Uzi fly. A total of 340 farmers were trained in 24 batches covering five courses against a target of 310 farmers in 22 batches. RSRS stall was awarded First prize for the exhibition category among 300 participatory organizations at JSS Suttur Jathra Mahothsova.

RSRS, Salem

Two trials were completed with new Multi x Bivoltine hybrids with high shell weight, cocoon shell percentage and fibre quality. Ten dfls each of L14 x CSR2, L15 x CSR2 and PMxCSR2

(control) were reared following standard rearing packages. Results indicated that L15 x CSR2 has performed better with respect to Single cocoon wt. (1.838g); Single shell wt. (0.388g) and S.R (21.09%) compared to that of PM x CSR2 (control) with SCW 1.808g, SSW 0.355g and SR 19.61%. Regarding the reeling characters, L15 x CSR2 was superior with AFL (980.22m) and RSR (67.51%) and L14 x CSR2 was superior with NBFL (749.24m), Renditta (6.79) and RS (14.75%) compared to PM x CSR2 (control).

Three trials were completed with new Single hybrid. viz., 2C x 4S and double hybrid, G11 x G19. Ten dfls each of the above hybrids along with CSR2 x CSR4 and FC2 x FC1 (control) were reared following standard rearing packages. Results of the trial indicated that the performance of 2C x 4S was *at par* with CSR2 x CSR4 (Control) and G11 x G19 was found better with ERR by No. & Wt. (9377 & 17.33 kg) compared to FC2 x FC1 (control). The first on-farm trial was completed with new ND7 x CSR2 (multivoltine hybrid) at RSRS clusters. A total of 1000 dfls were brushed at CRC, Vennanthur and distributed to six farmers and an average yield of 56.00 kg /100 dfls was harvested with an average single cocoon wt. of 1.99g; single shell wt. of 0.34g and SR% of 14.14.

On-farm trial was completed with new single hybrid CSR 16 X CSR 17 at RSRS clusters. A total of 1000 dfls were brushed at CRC/direct and distributed to six farmers and harvested an average yield of 71.00 kg/100 dfls with single cocoon wt. of 1.58g; single shell wt. of 0.33g and SR% of 21.23 were recorded. On-farm trial was completed with new single hybrid CSR50 x CSR51 at RSRS cluster. A total of 350 dfls were brushed with three farmers and an average yield of 62 kg/100 dfls was harvested and single cocoon wt. of 1.90g; single shell wt. of 0.40g and S.R% of 22.30 were recorded. 250 dfls of GEN hybrid were brushed with 2 farmers and harvested an average yield of 59 kg/100 dfls and single cocoon wt.

(1.80g); single shell wt. (0.38g) and S.R% (21.70 %) were recorded.

Under RSRS Salem cluster, 10 farmers were identified and demonstrated the application of technology package of INM inputs at the rate of Daincha 15.0 kg; Azospirillum -1.6 kg; Seriboost-1500ml; PSB 2.0kg; Neem Oil Cake 60.0 kg and Rhizobium- 200g per acre with a cost of Rs.2200-2500. The impact study of the technology package will be conducted in due course. Under Cluster Promotion Programme (CPP), a total of 14,83,365 dfls were reared and an average yield of 66.05 kg/100 dfls was obtained. Under popularization programme of new bivoltine hybrids 3,95,540 dfls comprising of double hybrid and CSR2 x CSR4 were distributed to 2,081 farmers and an average yield of 67.78 kg/100 dfls was recorded.

The RECs and its sub-units of RSRS, Salem conducted various need-based training programmes for the extension staff of DOS. A total of 90 staff has been trained under various programmes. Under ATMA scheme, new sericulture farmers selected by TSC (DOS) were imparted training both on silkworm rearing and mulberry cultivation benefiting 654 farmers. A full-fledged Soil Science Laboratory was established and a total of 694 samples of 593 farmers were analyzed. Necessary recommendations were given to farmers.

Established mass production unit of papaya mealybug parasitoids *Acerophagus papayae*, *Anagyrus loecki* and *Pseudleptomatrix mexicana* and 10,000 parasitoids have been supplied to farmers through DOS/CSB staff for release in the papaya mealy bug infested garden in Salem, Namakkal, Udumalpet, Villupuram, Thiruvannamalai, Krishnagiri, Hosur and Gobichettipalyam in Tamil Nadu and Palakkad in Kerala. Training programme on "Mass multiplication of parasitoids viz., *Acerophagus papayae*, *Anagyrus loecki* and *Pseudleptomatrix mexicana*" has been conducted for 10 DOS staff.

RSRS, Kodathi

During the period, three rearing trials were conducted with multi x bi hybrids viz., L15 x CSR2, L14 x CSR2 and PM x CSR2 (C). The analyzed data of the three rearing trials revealed that L14 x CSR2 performed better with respect to survival (97%) and yield whereas L15 x CSR2 was better in all other parameters. With regard to reeling parameters, L14 x CSR2 performed better for filament length (948.79 m.), renditta (7.14) and raw silk% (14.30%) compared to other test hybrid and control.

During the period, three rearing trials were conducted with one single hybrid 2C x 4S and one double hybrid G11 x G19 with CSR2 x CSR4 and FC2 x FC1 as control, respectively. The analysed data revealed that the single hybrid 2C x 4S showed higher survival (92%), single cocoon wt. (1.715g) and SR% (21.44) than control. Similarly, when compared to control the double hybrid, G11 x G19 showed higher survival (92%) and single cocoon wt. (1.843g). With regard to reeling parameters, 2C x 4S showed less denier (2.55) than the control and the double hybrid, G11 x G19 was found better with higher filament length (893.26 m) and denier (2.90) compared to control. The soil-testing lab was strengthened. A total of 53 soil samples were received from different clusters, analyzed for their soil nutrient parameters like soil pH, EC, OC%, available P and K and the soil analysis reports were issued with necessary recommendations. Soil samples from 679 CPP farmers under 6 clusters viz., B.G.Kere, Shapur, Ithandahally, Y.N.Hosakote, Gajanur and Harohally were tested and recommendations made on the basis of nutrient availability status. The sample tested showed that soils are holding high available P, normal EC and medium to low OC %.

During the period three crops leaf yield of V1 plot where INM was integrated under paired row spacing [(90+150) x 60cm] recorded an average yield of 12,410.33 kg/ha/crop. During the

period 4 crops leaf yield was recorded in TVDC plot under wide row spacing [(90+90+120) x (90+90+120)] and the average yield was 10778.27 kg/ha/crop]. During the period, a total of 2017 visitors visited this station from various institutions and states as a part of study tours. Under the study, three bivoltine pure races were collected from the main institute and reared. The seed cocoons harvested were sorted out and the same was sent to grainage section of the main institute for preparation of hybrid laying i.e., CSR48 x CSR4 and JPN 7 x CSR4. Apart from above, a total of 8 Bi x Bi hybrids and 9 Multi x Bi hybrids were received from the main institute under Race Authorization Programme and first rearing trial was conducted. The data recorded on the rearing performance of the above said hybrids are as follows:

Extension activities conducted at different RSRs

Sl. No.	Activity	Total events
1.	Group Discussions	135
2.	Enlightenment programme	18
3.	Demos of Technology	24
4.	Awareness programme	98
5.	Field days	96
6.	Film shows	59
7.	Exhibitions	9
8.	Need based training prog.	35
9.	Exposure visit to Research institute	4
10.	Workshops	4
11.	Krishimela	2
12.	Study tour	34
13.	Video conferences	5
	Total	524

During the period, Six CPP clusters brushed 862400 CSR hybrid dfls & harvested 506660 dfls. The average cocoon yield was 59.60kg. The average cocoon rate was Rs.326.45.

● Central Sericultural Research and Training Institute (CSRTI), Berhampore

Central Sericultural Research and Training Institute is the premier Research and Training Institute of the country. Since its establishment in the year 1943, the Institute has been rendering outstanding research, development, technical, technological, extension and service support through its four (4) Regional Sericultural Research Stations (RSRs) at Kalimpong (West Bengal), Koraput (Orissa), Ranchi (Jharkhand) and Jorhat (Assam) and 14 nested units i.e. 12 Research Extension Centers (RECs) at Nabagram (Murshidabad) & Mothabari (Malda) - West Bengal, Rongpoo (Sikkim), Deogarh (Orissa), Singhanpur (Chhattisgarh), Gumla and M.P. Raj (Jharkhand), Agartala (Tripura), Dimapur (Nagaland), Shillong (Meghalaya), Imphal (Manipur) and Aizwal (Mizoram) and two Research Extension Center sub-units (REC-SUs) at Bhandra and Rajmahal (Jharkhand), besides, generating expertise in mulberry sericulture through its various Human Resource Development programmes / 15 months structured "Post Graduate Diploma in Sericulture (PGDS)" course /

On-job training / capsule / need-based sponsored courses and contributing for vertical and horizontal growth of sericulture industry especially in Eastern and North-eastern India comprising of 13 states viz., West Bengal, Sikkim, Orissa, Chhattisgarh, Jharkhand, Bihar, Assam, Tripura, Nagaland, Meghalaya, Manipur, Mizoram and Arunachal Pradesh.

Mulberry Crop Improvement and Production

Application of vermicompost @ 30 mt/ha/year recorded leaf yield of 42.25 mt/ha/yr against 40.35 mt/ha/yr in control with an increase of 4.7% leaf yield. In plant geometry study, the spacing (90 cm+120 cm) x 60 cm yielded 29.5 mt/ha/year against 30.8 mt/ha/year in control (60 cm x 60 cm) with Rs.5974.00 as an additional income from the intercrops. Ten new mulberry varieties developed through hybridization were identified as higher leaf yielder (1.19 kg to 1.69 kg/ plant) with a gain of 12.2 to 59.1% over the S-1635 (1.06 kg/plant) under low productive soil condition (at Primary Yield Trial). Intercropping in mulberry with toria (Oct.-Dec.) and red amaranth (Jan.-Feb.) during establishment of mulberry plantation (Sept.-Feb.), and grown up mulberry with greengram (Mar.-May); cowpea (June - Aug.); toria (Sept.-Nov.) and red amaranth (Dec.- Feb.) have been identified as an ideal intercrop for additional income by the farmers with a cost benefit ratio of 1.4:1. The effectiveness of anti-transpirant - KCl (1%) application for increasing mulberry leaf yield under rainfed condition, is under validation at farmers' level. C-2028 - a flood tolerant mulberry genotype validated at farm level gave the leaf yield of 6.96 mt/ha/crop with less leaf senescence (20%) than S-1635 (48%) & S-1 (22%) varieties during Sept. crop (flooded condition). A ready reckoner of Sulphur fertilizer application for targeted yield of mulberry by applying Sulphur (Ammonium sulphate) @ 40 kg / ha/ year with a cost benefit ratio of 6.37:1 over control (No Sulphur) for irrigated Gangetic alluvial soil of eastern India is under validation.

Mulberry Protection

The chemical insecticide, thiamethoxam (0.015%) has been identified as most effective for control of whitefly with a safe period of 14 days. Weather based forecasting models for mulberry diseases and pests have been developed and are on the way of validation for further refinement through long-term data base management.

Silkworm Improvement

Rearing conducted with three productive and hardy Multi x Bi hybrids namely M6D(P)C x SK4(C), M6D(P)C x [D6(P)N x SK4(C)] and M6D(P)C x D6(P)N and one bivoltine hybrid D6(P)N x SK4(C) under multilocational trial showed 56.3 kg, 56.8 kg and 54.9 kg/100 dfls respectively in Multi x Bi against 48.3 kg/100 dfls in control (NxNB4D2), while in Bi x Bi, cocoon yield was 43.9 kg/100 dfls against 38.3 kg/100 dfls in control (NB18 x P5). Under large scale testing of new silkworm hybrids, 15.95 lakh dfls of Multi x Bi hybrid [N x (SK6 x SK7)] were tested at different locations which yielded 42 kg cocoons/100 dfls (range 20 - 62 kg/100 dfls) against 41 kg (range 25-50 kg/100 dfls) of control (N x NB4D2). M6DP(C) x (SK6 x SK7) was tested with 1.01 lakh dfls and cocoon yield was 39.5 kg / 100 dfls (range 25 - 54 kg/100 dfls). SK6 x SK7 the stable bivoltine foundation cross combining well with M6DPC & Nistari and having good productivity as seed crop which generally are in adverse seasons, provides a dependable opportunity to generate bivoltine seed cocoons within the state of West Bengal / this zone for the preparation of MxBi dfls for commercial utilization in West Bengal and nearby states. Since performance of N x (SK6xSK7) and M6DPC x (SK6 x SK7), both the combinations are better or *at par* with control (NxNB4D2). It further enhances it's scope for their commercial exploitation in the region and nearby states as well.

Technology Transfer

Under IVLP programme (Phase-III), a total of 600 (irrigated & rainfed 150 & 450 respectively)

farmers were covered and by following the packages of mulberry cultivation & silkworm rearing, mulberry leaf yield and cocoons production have been increased. In irrigated condition, mulberry leaf yield was increased from 36.2 to 40.1 mt /ha/yr with 10.77 % improvement over the control. And in rainfed condition, leaf production was increased from 10.1 mt to 11.7 mt/ha/yr with 15.84% improvement over the control. In irrigated condition, 58650 dfls of M x Bi and 17500 of M x M reared in 5 crops recorded an average cocoon yield of 46.6 kg in case of M x Bi and 26.4 kg in MxM against the control, 43.0 kg and 23.6 kg per 100 dfls, respectively. In rainfed condition, 61960 dfls were reared in 3 crops with an average cocoon yield of 40.9 kg from 13150 dfls of BixBi ; 42.8 kg from 41610 dfls of MxBi and 26.6 kg from 7200 dfls of M x M. The corresponding control yields were 36.2 kg, 38.6 kg and 23.5 kg per 100 dfls, respectively.

Cluster Promotion Programme (CPP) under XI Plan

CPP has been initiated jointly with DoT (Seri), West Bengal and DoS, Mizoram at two locations in West Bengal (Murshidabad and Malda districts) and one in Mizoram (Serchip district). A total of 627 acres with 1477 farmers in all the three clusters have been covered, of which, 215 acres are as new plantation.

Extension Communication Programmes

To disseminate technologies, educate & train the farmers on different aspects of improved mulberry cultivation and silkworm rearing practices/technologies developed by the Institute, following programmes were taken up and more than 12942 farmers / seri-stakeholders participated in the following melas, field days, awareness & A-V prog. and visited exhibition and got educated on various sericulture technologies:

Sl.No.	Activity organized	Nos. (Participants)
1	Resham Krishi Mela	05 (1506)
2	Audio-visual programme	51 (2295)
3	Field Day	51 (2381)
4	Exhibition	49 (2737)
5	Awareness programme	56 (2598)
6	Farmers' & Trainers Training programme	71 (1425)

Human Resource Development

Various HRD programmes were taken up for awareness, skill updation and transfer of technologies both in pre-cocoon and post-cocoon aspects through "Structured" and "Non-structured" courses for sustainable development of sericulture in the region and the country as a whole. During the period, a total of 457 candidates were trained [PGDS: 27, MDP (160) and SUP for farmers (270)].

Progress of RSRs

RSRS Kalimpong (West Bengal)

Implemented the collaborative projects namely "PRE-3345: Development of weather-based forecasting models for mulberry pests" and "CSS2107: Development of forewarning system of mulberry diseases" of the Main Institute, besides, "Testing of rearing package" as validation trial at farmers' field, two programmes and implementing additional mandate along-with taking up other routine

extension activities. Implemented the Muga Augmentation programme in collaboration with MSSO, Guwahati.

RSRS Koraput (Orissa)

Adoption of IVLP package of practices of mulberry cultivation and silkworm rearing improved the mulberry leaf yield to 10.5 mt/ha/yr and cocoon yield of 46.8 kg/100 dfls which was 11.6% and 9.35% respectively over farmer's traditional practice (9.35 mt/ha and 42.8 kg/100 dfls). Application of Serecillin as a silkworm crop protection measure being a validation programme is found to increase cocoon yield to 50.6 kg/100 dfls by 16.8% gain over control (42.97 kg/100 dfls). Popularization of organic farming - vermicompost as an alternative to FYM at the farmers' level revealed leaf yield gain of 8.20% and cocoon yield of 10.6% gain over control at farmers' level. Implemented two collaborative projects of Main Institute entitled "PRE 3345: Development of weather-based forecasting models for mulberry pests", "CSS 2107: Development of forewarning system of mulberry diseases" besides taking up routine extension activities.

RSRS Ranchi (Jharkhand)

Under Integrated Nutrient Management for increasing the leaf productivity of mulberry in rainfed condition of Jharkhand, application of inputs, 75 kg N : 50 kg P : 50 kg K /ha/yr + Vermicompost @ 10 mt/ha/yr + Azotobacter @ 10 kg/ha/yr has been identified as best combination with an yield of 8.16 mt/ha/yr and 11.9% gain in comparison to the control (7.29 mt/ha/yr). Implemented the collaborative project "CSS 2107: Development of forewarning system of mulberry diseases" of the Main Institute and is undertaking other routine extension activities. Adoption of IVLP package of practices of mulberry cultivation and silkworm rearing improved the mulberry leaf yield (8 mt/ha/yr) by 16% and cocoon yield (30.2 kg/100 dfls) by 22% over farmer's traditional practice (3.0 mt/ha and 23.6 kg/100 dfls,

respectively). Application of Serecillin as a silkworm crop protection measure being a validation programme found to increase cocoon yield of 30.4 kg/100 dfls by 14.6% gain over control (26.1 kg/100 dfls). Other routine extension programmes/activities are also taken up.

RSRS Jorhat (Assam)

Adoption of IVLP package of practices of mulberry cultivation and silkworm rearing improved the mulberry leaf yield (8 mt/ha/yr) by 14 % and cocoon yield (30.2 kg/100 dfls) by 9 % over farmer's traditional practice (2.9 mt/ha and 33.8 kg/100 dfls respectively). Application of Serecillin as a silkworm crop protection measure being a validation programme is found to increase cocoon yield of 36.8 kg/100 dfls by 15.4 % gain over control (31.9 kg/100 dfls). Two collaborative projects namely, "PRE 3345: Development of weather based forecasting model for mulberry pests" and "CSS 2107: Development of forewarning system of mulberry diseases" of Main Institute were implemented, besides taking up other routine extension programmes/activities.

- **Central Sericultural Research and Training Institute (CSRTI), Pampore**

Central Sericultural Research and Training Institute, Central Silk Board, Pampore, J&K is a pioneering Institute in the field of temperate and sub-tropical sericulture in North-western India. The Institute has been catering to the needs of the silk industry & Department of Sericulture by consistent R&D and extension activities through its wide spread network of RSRS's, REC's and CDC's located in the states of Jammu & Kashmir, Himachal Pradesh, Punjab, Haryana, Uttarpradesh, Uttarakhand and Rajasthan. It has nested under it two Regional Sericultural Research Stations (RSRSs) at Jammu (J&K) and Sahaspur (Uttarakhand), one P4 Basic Seed Farm at Manasbal (J&K), 13 Research Extension Centres (RECs) at Y.K.Pora, Nowshera, Sujjanpur, Barnoti, Gorakhpur, Gonda, Duttanagar, Udham Singh

Nagar, Bageshwar, Una, Fatehnagar, Hamirpur and Chutmalpur with five Sub-units of the RECs at Bandipora, Tikri, Tral, Panchkula and Bhadrasi. Further, five of the extension centers viz., Tral, (J&K), Bandipora (J&K), Tikri (J&K), Nowshera (J&K) and Kalsi (Uttarakhand) are functioning as Cluster Development Centers (CDCs).

Mulberry Improvement

Out of the eleven short listed F1 selections, four selections have been put forth to multi locational trials in the temperate zone at three sites. Four F1 selections i.e., S-140, S-145, S-152 and S-106 recorded more leaf yield (> 10 % over control Goshorami), rooting percentage (95% as against 18% in Goshorami) and less frost damage (<6% as against 38% in Goshorami). The new selections will be released after completion of the MLTs. Under Temperate conditions, the studies on the effect of biofertilizers applied in nursery on growth and yield parameters under field conditions revealed non-significant differences between inoculated treatments and treatments with full dose of chemical fertilizers. However, significant differences were registered over the treatment in which no fertilizer was applied.

Mulberry Production

Leaf harvesting and pruning technology for mulberry trees grown under sub-tropical conditions of North India has revealed that the commercialization of second crop under sub-tropics has picked up through adoption of developed technology resulting thereby in an average cocoon yield of about 30 kg/100 DFLs, as against less than 10 kg/100 dfls recorded earlier. No systematic pruning schedule is followed at farmers level, with the result the autumn crop has not been able to be commercialized due to production of poor leaf quality. With the development of leaf harvesting cum pruning schedule multiple cropping system has been possible. In addition to helping for improving the leaf quality for autumn crop, the leaf

production during subsequent spring crop also increases by about 15-20%.

Crop protection

Based on regular survey major insects inflicting damage to mulberry were *Glyphodes* (= *Margaronia*) *pyloalis* Wlk. and *Hemerophilla atrineata* and main disease causing loss above ETL to mulberry were Powdery Mildew (*Phyllactinia corylea*) and leaf spot (*Cercospora moricola*) under temperate conditions. Studies on natural enemy complex of pests/diseases revealed *Apanteles obliquae* and *Pristomerous sulci* to be predominant parasites of *G.pyloalis* whereas *Halyzia tchitrscherini* fungivorous beetle, as predominant predator of powdery mildew spores. This has been reported for the first time from this region.

Silkworm improvement

Under the project improvement of silkworm *Bombyx mori*.L 10 breeding populations for isolation of breeds for sub-optimal conditions have completed F8 generation in autumn, 2010. The breeding populations SO-4, SO-12 and SO-20 have recorded >94% pupation with 21.84%, 22.16% and 21.57 % shell respectively. Under isolation of thin denier lines, six breeding populations completed F5 generation in autumn, 2010. The denier in these lines was recorded in the range of 2.00 to 2.40. Two productive silkworm hybrids, SBGP22 X SBGP5 and CSR2 X SBGP22 evolved by the Institute have completed trials under Provincial Race Authorization Programme. Under maintenance programme, 9 bivoltine races viz., SH6, NB4D2, CSR2, CSR4, SBGP5, SBGP20, SBGP22, DUN6, and DUN22 are being maintained under breeders / parental stock.

Gene Pool

CSRTI, Pampore maintains 58 mulberry accessions at Pampore. 80 accessions of mulberry are being maintained at P4 BSF, Manasbal as Temperate Germplasm Bank. 168 silkworm races

are being maintained at Silkworm Germplasm Bank, at Pampore (Mostly bivoltines). A working germplasm of 44 silkworm accessions are being maintained at RSRS, Sahaspur. 58 silkworm genotypes at Silkworm Germplasm Bank are maintained at RSRS, Jammu.

Seed Production

Parental seed of CSR2, CSR4, SH6 and NB4D2 are maintained at P4 BSF Manasbal at P3 level and is supplied at P2 level to Sericulture Development Department of Jammu & Kashmir for further multiplication and preparation of F1 seed of recommended hybrids.

Human Resource Development

The Institute and its RSRS's imparted training to 303 DOS officials of J&K, Punjab, Himachal Pradesh, Uttarakhand and Uttar Pradesh states on various aspects of sericulture, moriculture and extension technologies. The Institute under specialized training programmes covered 23 officials including newly recruited field staff and CDC staff (CSB & DOS). 225 farmers were trained during 2010-2011 under 7 Farmers Field Schools. Under Skill Development programme 180 Farm workers were imparted one month training through CSRTI, Pampore, RSRS, Miransahib and RSRS, Sahaspur. The Institute is serving as IGNOU study centre. Three candidates passed Certificate Course in Sericulture and 27 Candidates are presently have enrolled through three study centres located at Pampore, Jammu and Sujanpur.

Extension Activities

41,700 dfls were reared under 13 extension centres in 7 states covering 687 farmers during spring 2010 recording a cocoon production of 15441.82 Kg. During summer 2010, a quantity of 2,350 dfls were reared through 39 rearers yielding 567.67 Kg cocoons.

During monsoon 2010, a quantity of 9,304 dfls were distributed among 142 farmers recording a cocoon production of 3,203.60 Kg.

During autumn 2010, a quantity of 20,300 dfls was reared by 363 rearers yielding cocoon production of 6128.59 Kg.

In order to sustain silk industry, Central Silk Board took an initiative of establishing Sericulture Clusters in the Country and accordingly, in North India six such clusters are in operation. Four clusters have been established at Tral, Nowshera, Bandipora and Tikri in J&K state & one cluster each at Hamirpur, Himachal Pradesh and Kalsi, Uttarakhand are in operation. Through five CDCs under CSRTI, Pampore, a total quantity of 51,125 dfls were reared by 636 farmers during spring 2010, recording a cocoon production of 18,759 Kg. During summer/autumn, 2010 the CDCs reared 16,420 dfls through 310 rearers recording a total yield of 3923.75 kg.

Events

Group discussions	146
Field / Farmers days	35
Film shows	40
Awareness Programmes	12
Vicharghoshtis	15
Sericulture Exhibition	01
Resham Krishimelas	03
Workshop	01

RSRS, Jammu (J&K)

Three thermo tolerant silkworm breeding lines have been advanced to F6 and F7 generations during spring 2010 and autumn 2010 respectively. These lines have performed better in pupation rate (> 90%) and cocoon characters (>20% shell & 925 m filament). Under maintenance of breeders stock, seven RSJ breeds namely RSJ1, RSJ3, RSJ4, RSJ11, RSJ13, RSJ14 and RSJ15 are being maintained from spring to spring rearing season. Eight vermeries have been prepared at farmer places. Under this programme, three vermeries each at Nowshera and Tikri (J&K)

and two vermeries at Sujapur were developed. The earthworm strain of *Eisenia foetida* was successfully exploited in these vermeries for production of vermicompost. Farmers are successfully harvesting the vermicompost and utilizing in their mulberry plantation as organic manure instead of chemical fertilizers. 103 women rearers have been imparted training on utilization of waste silk cocoons for preparation of cocoon handicrafts. Pest infestation/survey/tests related to commonly available mulberry genotypes viz. S146, Chinese white, Chak Majra and Tr-10 in Jammu, Udhampur and Kathua (DOS & CSB farms) study sites, have been conducted for the major pests. *Diaphania pulverulentalis* (Lepidoptera: Pyralidae) showed infestation in the months of May-June followed by September-November recording infestation, comparatively more in S146 mulberry variety. *Apriona germari* Hope (Coleoptera : cerambycidae) showed its presence throughout the year in almost all study sites and infestation was recorded to the tune of 5-8%.

RSRS, Sahaspur (Dehradun)

Mulberry genotypes S1635 and S146 was found to be ideal under different eco-zones of Himachal Pradesh. 8' x 8' spacing was found ideal for tree type of plantation. After about 5 years of plantation, 8-10 MT of quality leaf is possible per ha/year from mulberry block. Under sub-tropical conditions of Dehradun, one local strain of Azotobacter, *Stenotrophomonas maltophilia* (Gene Bank Accession Number DQ 777) has been isolated under Dehradun conditions after standardization of culture media. Carrier of the biofertilizer (Mixture of soil, charcoal and silkworm excreta) has also been standardized to develop biofertilizers for integrated nutrient management system for mulberry. Screening of Mulberry Genotypes for high pH soil revealed that mulberry genotypes AR-14 and AR-12 are suitable for growing under high pH 9.0-9.5 and Electric

conductivity 0.4-0.8 in User land. Highest leaf yield of 6.69 and 6.26 MT/ha has been recorded in these genotypes, respectively as against 5.64 MT/ha in S-146 (yielding about 12 MT/ha in normal soil). Thermo Tolerant Hybrid, ATR16 X ATR29 completed trials under Provincial Race Authorization Programme. Under Special SGSY project, a total of 5514.10 Kg cocoons were produced with an average productivity of 28.28 Kg/100 dfls, recording a growth of 78.94% in number of farmers (442), 176% in dfls consumption (19500 dfls) and 171.7% in cocoon production, respectively, in comparison to the last year. Besides, 124 farmers in mulberry plantation and 10 in vermicomposting technology were trained and 123 farmers were covered for Farmer's study tour.

- **Central Sericultural Germplasm Resource Centre (CSGRC) Hosur**

Mulberry Division

Survey and exploration was conducted in Punjab and Haryana during November, 2010 and 18 mulberry germplasm were collected raising the number of collections through survey to 744; also 30 mulberry germplasm materials were collected from KSSRDI, Bangalore . 44 mulberry germplasm accessions were added in the field gene bank raising the total accessions to 1180 of which 910 are indigenous and 270 are exotic. 20 mulberry accessions were characterized for 14 morphological and anatomical parameters; thus 1065 accessions are so far characterized from the field gene bank. 55 mulberry accessions were evaluated for propagation traits. 35 accessions recorded more than 80% rooting. So far, 949 accessions have been evaluated for propagation traits. 189 (Indigenous – 147, Exotic-42) mulberry accessions were evaluated for growth and yield parameters under ABD of which 6 accessions recorded higher leaf yield than V1. So far, 701 accessions (Ind-546 and Exotic-155) have been evaluated. 36 accessions were cryo-preserved, at

NBPGR using dehydration and slow freezing protocol. Thus cryo-preservation (-196°C) of mulberry GR in the national Cryo gene bank is completed for the core group of 338 accessions. 120 short-listed accessions are established in the experimental plot for physiological characterization with reference to Water and Nitrogen use efficiency. New project on screening of mulberry germplasm for abiotic stress tolerance (for alkaline and saline) was initiated with 25 accessions out of 100 short listed accessions. Project on DNA marker aided analysis of mulberry gene bank towards a core assembly for sustainable conservation and enhanced utilization in crop improvement. A DBT funded collaborative project with CSRTI, Mysore was initiated with short-listed 616 mulberry accessions. 47 mulberry accessions were supplied in 8 spells to different Indenters. 30000 cuttings of S1 and S13 were supplied to DOS, Tamil Nadu. Saplings of 22 fruit yielding accessions are supplied to farmers through NGO. Mulberry Germplasm data base CD is developed with photo documentation of 1065 mulberry accessions, with the viewing facility of images of plant, leaf, flower and fruit along with characterization data.

Silkworm Division

The Centre holds 443 silkworm genetic resources comprising of 73 multivoltine, 350 bivoltine and 20 mutant accessions in Gene Bank. The accessions were conserved true-to-type with package of conservation management procedures developed by the Centre. Twelve new genetic resources collected from CSRTI, Mysore and KSSRDI, Bangalore during 2009-10 were added to the gene bank by assigning accession numbers for maintenance and conservation. All the silkworm germplasm accessions were morphologically characterised for 27 morphological descriptors at various growth stages *viz.*, egg, larva, cocoon, pupa and moth morphology, the characterisation aspects are updated in the database. 73 Multivoltine accessions were conserved by rearing five crops in a year which completed 73rd ~ 77th

generation. The 443 bivoltine accessions were conserved by single crop rearing system by rearing accessions in three batches and these accessions completed 16th generation, whereas, mutants accessions were conserved under two crop cycles system/year. These accessions completed 19th and 20th generation respectively. The confirmatory morphological characterisation was done for 73 multivoltine, 350 bivoltine and 20 mutant accessions at various growth stages *viz.*, egg, larva, cocoon, pupa and moth stages for all silkworm accessions. The variability in the morphological features of the germplasm accessions for each descriptor was found true-to-type as per the passport data. Preliminary evaluation of 73 multivoltine silkworm accessions was carried out in five crops for growth and reproductive traits. BMI-043 was better qualified in seven traits, BMI-0073 in six and BMI-007, BMI-0066, BMI-0065, BMI-0001 and BMI-0062 in five traits out of 12 traits selected. Preliminary evaluation of 350 bivoltine accessions during the year was carried out. The accessions BBI-0363 and BBI-0290 performed better for six traits followed by six accessions BBI-0086, BBE-0004, BBI-0364, BBE-0043, BBE-0332 and BBI-0324 which performed better for five traits. 20 mutant accessions were evaluated in two crop cycles and the evaluation data on the important evaluation parameters were recorded and updated in the SGIS database. Under utilization and supply of serigenetic resources, 79 BV accessions were supplied to eight indenters in 18 spells and 71 MV accessions were supplied to 10 indenters in 19 spells for the research and various crop improvement programmes. 73 MV & 339 BV accessions were evaluated for all the 16 post-cocoon traits in three phases in collaboration with CSTR, Bangalore. 30 multivoltine accessions were characterized out of 72 multivoltine accessions with three EST markers *viz.*, PTH, Silk protein and Yolk protein gene primers. The specific markers for high yielding group and their

genotypes were identified through Expressed Sequence Tags (EST). Higher frequency of allele "a" and its genotype "aa" seem to have putative association with more number of productivity characters. The stress associated esterase enzyme activity of 72 MV silkworm accessions were categorized into high, moderate and low enzyme activity groups. Four accessions *viz.*, OS-616, Nistari, KW2 and MU303 possess higher esterase enzyme activity while 20 accessions *viz.*, Pure Mysore, Tamil Nadu white, Kollegal Jawan, MY1, Guangnong plain, ZPN (SL), A23, A25, O, B, AP12, MU11, WA14, MW13, MHMP (Y), P4D3, Nistid (Y), MY1 (SL), TWxSK6xSKI, BL-43, M6DP (Green) possess moderate enzyme activity and the remaining 48 accessions with low enzyme activity. The disease resistance related enzyme alkaline protease exhibited three kinds of enzyme activity *viz.*, high, moderate and low. The higher alkaline protease activity was observed 22 accessions *viz.*, Sarupat, MY-1, B, PA13, PMS2, MU-1, WAI4, MY23, MW13, NK4, Cambod G, LMP, DMR, LMO, PM(SL), BL23, MU303, MU520, MU10, APM-1, SLKSPM and M6DP(C)GREEN. While seven accessions exhibited moderate enzyme activity and the remaining 43 accessions have low alkaline protease enzyme activity. The maximum esterase enzyme inhibition (95.13%) was in BMI-0063 and minimum inhibition (0.04%) in BMI-0064. Similarly alkaline protease exhibited maximum enzyme inhibition (97.65%) in BMI-0040 and minimum (1.4%) in BMI-0065 accessions, respectively. Photo images of 73 Multivoltine and 50 BV accessions were collected at Egg, larval and cocoon stages for development of database on silkworm genetic resources. The dechlorination of silkworm accessions is carried by using Sodium hypochlorite and KOH solutions in different concentration and durations. The hatching ranged from 88 to 98% in eggs treated with 0.5% and 1% KOH under different durations and no hatching is observed in 2% KOH solution. Allelic diversity of fibroin gene of silk in the silkworm Genetic

Resources was observed in 10 each of multivoltine and Bivoltine accessions. Among the multivoltine accessions, four accessions showed three alleles of 900bp, 600bp and 300bp, five accessions showed two alleles at 600bp and 300bp and one accession had a single alleles at 900bp. Among the bivoltine accessions, three accessions have three alleles; five showed two alleles and two accessions have a single allele.

Silkworm Seed Technology Laboratory (SSTL), Bangalore

Silkworm Seed Technology Laboratory (SSTL) with a mandate of developing technologies for silkworm seed sector improvement and to monitor the silkworm diseases has contributed the following during the year:

Long-term Preservation of Silkworm Seed

The long-term preservation technique developed for cross breed eggs (PM x CSR2) has been utilised for commercial purpose. A quantity of 10.76 lakh of CB eggs produced at eight Silkworm Seed Production Centres of National Silkworm Seed Organization were preserved and distributed to the farmers. Similarly, cross breed eggs of Nistari x NB₄D₂ and Nistari x CSR₂ could be preserved through double step refrigeration method at early embryonic stages upto 80 days without affecting hatching and cocoon yield.

The prolonged preservation study for bivoltine eggs (700 days) of popular silkworm breeds (CSR2, CSR4, CSR6, CSR26, CSR27, FC1 and FC2) is under progress to develop a schedule aimed at reducing the life cycles and to preserve the vigour of the breed.

Developmental Biology

Studies were conducted to standardize the incubation of silkworm seed, based on the calculation of Effective Accumulated Temperature Points (EATP) for different breeds, showed variation in EATPs between breeds, methods of incubation and season. The eggs hatched after

135 ~185, 145 ~ 172 and 160 ~176 points during summer, rainy and winter seasons, respectively and hatching day range from 9th–13th day based on season. The study is continued to standardize incubation technique and to formulate a ready reckoner.

Seed Crop Rearing

The construction of prototype solar passive energy based energy efficient model rearing house is completed in collaboration with M/s. TERI. The unit would be used to test verify the maintenance of temperature and humidity during silkworm rearing.

Disease Monitoring

Joint Silkworm Disease Monitoring Survey involving NSSO, DOS of Karnataka, Andhra Pradesh and Tamil Nadu conducted seasonal surveys for incidence of pebrine covering a total of 1291 lots (356 bivoltine & 935 multivoltine) in seed areas at Anekal and Kunigal (Karnataka), Hosur and Denkanikottai (Tamil Nadu), Hindupur and Madanapalle (Andhra Pradesh).

Human Resource Development and Extension

Thirteen training programmes on various aspects of seed technology were conducted in 23 batches under regular courses, Central Sector Scheme and Third Country (JICA) training programmes. 269 candidates from various State Sericulture Departments/agencies (Karnataka, Tamil Nadu, Andhra Pradesh, Assam, CSB, NSSO, KSSRDI, APSSRDI, LSPs of Karnataka & West Bengal) and Third country trainees from Ghana, Kenya, Kyrgyzstan, Nepal, Madagaskar, Nigeria were imparted training on various facets of seed technology.

Six TOT programmes, Karnataka (3), Tamil Nadu (2) and Andhra Pradesh (1) were conducted for the benefit of technical officers / officials of Department of sericulture, field functionaries, seed farmers and seed producers covering 403 personnel...

● Seribiotech Research Laboratory (SBRL), Bangalore

The Seribiotech Research Laboratory, Central Silk Board, Bangalore is involved in research on various disciplines of Biotechnology *i.e.*, Silkworm and Host Plant Genomics, Proteomics and Molecular Pathology through CSB and DBT funded programmes. The highlights of research activities during the period under report are as indicated below:

Silkworm Genomics

The Seribiotech Research Laboratory, Central Silk Board, Bangalore is focusing its area of research on Silkworm Genomics, Proteomics, Molecular Pathology under CSB and DBT funded programmes. Introgression of DNA markers and segregation of markers studies continued. Out of five markers segregated in F2 population, four markers segregated significantly. The introgression of NPV resistance associated markers to CSR 2 has been further advanced and the back cross line is at BC5F4 generation. Enhanced NPV tolerance was recorded in BC lines challenged to NPV. The back crossing of three Nistari (antiviral transgenic lines) have been continued to transfer the antiviral genes to CSR 4 and CSR 27. The lines are at BC3 generation. The bioassay of three parental transgenic races conducted at SBRL, has shown enhanced tolerance to NPV. The expression patterns of genes at different time intervals has been studied. The metabolic genes as well as five Heat shock protein genes has been analysed and results revealed the up regulation of Sorbitol dehydrogenase (SDH) gene on HCl treatment indicating increased glycogen synthesis for further embryonic development. However, HCl treatment down regulated Phosphofructo kinase (PFK) gene expression after 18h of oviposition indicating arrest of glycerol and sorbitol conversion. The expression of Poly A Binding Protein (PABP) gene was higher upon HCl treatment revealing initiation of translation. On the

other hand the expression levels of Trehalase (TRE), Glycogen phosphorylase (GPase), Glucose 6 phosphate dehydrogenase (G6PD), Bmtubulin (Bmtub) and Heat shock protein (Hsp) genes did not vary significantly except for Hsp 90 and Hsp 40 which were up regulated on acid treatment till 18h compared to the untreated eggs. The results of the study thus suggest that SDH and PFK genes have a crucial role in diapause termination as evidenced by HCl treatment, while, other genes do not have any major roles.

Proteomics

Immune responses elicited due to infestation by dipteran parasite, *Exorista bombycis* (uzi fly) on the silkworms, *Bombyx mori* and *Samia cynthia ricini* have been analyzed. In addition to cellular changes during infestation, uzi parasitism induced up regulation of immune - associated proteins in an age - dependent manner in *B. mori* strain CSR2. Hsp70, Prophenol Oxidase Activating Factor (PPOA), paralytic peptide, paralytic peptide binding protein, chaperonin=t-complex polypeptide, low molecular lipoprotein 30K, spaetzle and gp27 were up regulated. Hsp70, Spaetzle and PPOA showed graded increase in expression in integument after parasitism whereas it was at a lower level in the haemocytes. Expression of an insect cytokine, spaetzle, was at a higher level in haemocytes at all ages and increased with age in fat body after infestation. These findings indicate activation of a pathway including PPO and spaetzle due to uzi fly infection in *B. mori*. *S.c.ricini* showed encystment of uzi maggot and the infection induced protein profile variation in integument and haemolymph.

Molecular Pathology

Different insect pests (12 different types) harbouring mulberry fields as well as mulberry silkworms have been collected for screening of microsporidiosis. Seven different microsporidians were identified out of which three were from the mulberry silkworms and the remaining were from

the different mulberry insect pests viz., *Diaphania pulverlentalis*, *Pieris rapae*, *Spodoptera litura* and *Technia violae*. The studies on spore morphology, pathogenicity, cross infection, mode of transmission and life cycle (for three microsporidians) and cross infectivity to silkworm was carried out. The molecular analysis with SSU-rRNA has been carried out. The nucleotide sequence showed that six microsporidians belong to the genus *Nosema* and one to the genus *Vairimorpha*. Eighteen isolates of microsporidians belonging to *Nosema/Vairimorpha* species have been identified from *A.mylitta* populations from Ranchi, Kharsava (Jharkhand), Chinnur, Warangal (Andhra Pradesh), Khadgora, Pali and Bilaspur (Chhattisgarh). Studies on life cycle features of tasar microsporidian revealed Octoschizogony–Schizogony–Octosporogony–Sporogony–Octosporoblast–Octopansporoblast–Octospore group, which are unique life cycle features of the genus *Vairimorpha*. It is interesting to note that the microsporidians isolates of eri and tasar causing 50% mortality to *Bombyx mori* after 10 and 16 days, respectively in lab bioassay studies. However, these strains are non-virulent to their native hosts.

Cloning of lipophorin receptor from *Samia cynthia ricini* and vitellogenin receptors from *Bombyx mori* and *Samia cynthia ricini*, using degenerate primers from insects and vertebrates is employed to identify receptors. Lipophorin (Lp) and vitellogenin (Vg), hemolymph collected from the pupae was subjected to KBr ultracentrifugation for purification. The lipophorin is purified to its homogeneity. Studies have been initiated to identify pathogens associated with flacherie disease in silkworm. Flacherie diseased silkworm samples collected from various areas in Karnataka, Andhra Pradesh, Tamil Nadu and Kerala were subjected to PCR diagnostics which revealed presence of DNV2 with NPV co-infection in some cases. However, IFV was not

detected in any of the samples. The bio-assay studies of the inoculums show the symptoms like flaccid body, lack of appetite, diarrhoea etc., and most of the worms died within seven days and did not moult to the next stage. Studies are being carried out to know the dynamic proliferation of BmNPV in different silkworm races and to investigate the differential gene expression in resistant and susceptible races of *B. mori*. Three multivoltine *i.e.*, Nistari, Hosa Mysore and Pure Mysore and two bivoltine (CSR2 and NB4D2) races of *B. mori* has been studied at [6, 12, 24, 48 and 72 post infection (pi)]. The studies of expression of GP41 (NPV gene) shows that virus enters into midgut cells at the same rate in all the races. However, expression of the gene increases in CSR2 enormously upto 72 hours (pi) while in Nistari it was constant upto 72 hours. This is indicative of the fact that races are different in physiological control of the NPV at later stage.

B. NON-MULBERRY

● Central Tasar Research and Training Institute (CTR TI), Ranchi

Central Tasar Research and Training Institute, Ranchi is a leading Institute of Central Silk Board endowed to conduct R & D to cater to the needs of tasar silk industry (both tropical and temperate), a tribal based rural enterprise in the country. The Institute provides the state-of-the-art technological know-how to the command states through its network of eight Regional Stations (RTRS) *viz.*, Dumka (Jharkhand), Jagdalpur (Chhattishgarh), Baripada (Orissa), Warangal (AP), Bhandara (Maharashtra) for tropical areas and Imphal (Manipur), Bhimtal (Uttaranchal) and Batote (J&K) for temperate areas; eight Research Extension Centres (REC) from tropical *viz.*, Hatgamaria (Jharkhand), Katghora (Chhattisgarh), Bangriposi (Orissa), Bhadrachalam (AP), Robertsganj & Jhansi (UP), Purulia (WB), Nasik (Maharashtra); two RECs for temperate areas Palampur(HP) and Gopeshwar(Uttarakhand) and

three Oak tasar extension centres cum BSMTCs, Umrangshu, Yaikongpao and Kikrma under the control of RTRS Imphal. From the current year, two P4 stations have also started functioning at Chakradharpur (Jharkhand) and Kargi Kota (Chhattisgarh) to support the production of quality elite seeds.

Host Plant Improvement, Production and Protection

Based on two year's data on seed and seed germination behaviour, three plus trees (one of *T.arjuna* from Chakaradharpur and two of *T.tomentosa* from Baharagoda and Mandla, respectively) have been identified for further multiplication. Based upon various morphological, biochemical, anatomical and molecular studies for characterization and subsequently bioassay trials, three accessions of *T.arjuna* and one accession of *T. tomentosa* have been finally selected as superior ones for further multiplication. Protocol has been developed for *in-vitro* multiplication of *Terminalia* sp in WPM MMS medium supplemented with various concentrations of BAP (0.5, 1.0, 1.5, 2.0 and 2.5 mg/L) + NAA. For development of chawki garden under two crop system, pruning of *T.arjuna* at 3' height, fertilizer dose of 100:50:50 NPK/ha/yr (50:50:50 kg NPK/ha during first crop and 50 kg N/ha during second crop) along with 2 kg manure/plant/crop has been found as a better proposition. Combination (SM5) of secondary nutrients *viz.*, Mg, Ca & S under field trial was found to improve the leaf yield of tasar host plant by 27.45% and leaf quality (Leaf moisture - 4.96%, total minerals -11.83%, crude protein-16.45% and total carbohydrates-11.66%) over control.

Silkworm Improvement, Production and Protection

Presence of seventeen diapause specific Expressed Sequence Tags (ESTs) was identified during different phases of diapause. On their presence, diapause termination was found to start

when pupae were 195 days old. These ESTs are registered with the Gene Bank. Studies on differential display of fat body mRNA in Daba ecorace showed allelic variation even in the same aged larvae. Unique band in low weight group showed similarity with NADH dehydrogenase gene. A set of small mRNA molecules were also found which are unique for *A. mylitta*. Eight ecoraces of *Antheraea mylitta* were conserved in the *ex situ* Germplasm Bank. Sal based semi-synthetic diet for young age rearing of tasar silkworm was developed with higher young age survival (95.7%). TLC of leaf extract of different tasar food plants indicated presence of β -sitosterol (band at Rf 0.6). The band at Rf 0.183 found common in all *Terminalia* sp. can be considered as fingerprint of the group. Twenty seven isolates of disease causing pathogens (microsporidia-10 and bacteria-17) are registered with the NCBI as specific to *A. mylitta*. A total of 2345 ampoules of Leaf Surface Microbe formulation (LSM) were produced and supplied to CSB / DOS units of different tasar growing states for control of Virosis of silkworm. Average increase in cocoon yield by 12 per dfl was recorded in LSM sprayed lots. Trials conducted on the effect of Jeevan Sudha (botanical formulation against Virosis) with 600 farmers covering 1.20 lakh dfls in Jharkhand indicated reduction of virosis by 37% and improvement in cocoon yield by 11 per dfl. Method has been developed for laboratory culture of Stem borer, *Aelosthes holosericea* for development of control measures.

Post-cocoon Technologies

Wet reeling machine having 30 ends / five basins for tropical and temperate tasar cocoons has been developed. It has a capacity to reel 4000 cocoons and it can produce 3.5 kg/day of reeled yarn. Cocoon cooking recipe for wet reeling of tropical and temperate tasar cocoons was developed. The yarn produced has good lusture, adhesive and test result showed upto 3.10 g/d

tenacity. The untwisted wet reeled yarn can be directly used as a warp or weft for manufacturing fine tasar silk fabrics or with other fibres. A pedal free solar energy operated spinning machine has been developed for reeling and spinning of tasar silk. It produces 280 to 300 g raw silk per day.

Regional Tasar Research Stations (Tropical) RTRS, Warangal

Towards improvement of fecundity and survival in the Andhra Local, desired traits have been introduced from Daba TV as evident by the heterosis (10.96-16.52%) and over dominance for fecundity (9.0-13.56%) in grainage under *in situ* conditions. Higher rate of over dominance (35.16-58.82%) for survival was recorded in BC-IV line. Rearing trails of the BC- IV line of Andhra Local ecorace indicated cocoon yield in the range of 29.0-38.0 per dfl during different crops as against 4.0-7.0 cocoons in Andhra local and 14-20 cocoons/dfl in Daba TV.

RTRS, Baripada

The rejuvenated stock of Sukinda TV is being maintained by the Station. The Station undertook the preparation and supply of laying to the farmers for its popularization. Cocoon yield in the I,II and III crops were 108, 22 and 98 cocoons per dfl. The Station also undertook the conservation of Sal based modal eco-race inside wire mesh enclosure erected in peripheral region of Simlipal Biosphere.

RTRS, Jagdalpur

The Station took up studies to evaluate the feasibility of exploiting *Lagerstroemia*, the secondary food plant, for silkworm rearing. Though the cocoon yield of 18 and 15 per dfl, respectively in I and II crops was recorded on *Lagerstroemia*, under switch over conditions (rearing on *Terminalia* upto 5th day of V stage and shifted to *Lagerstroemia* till cocooning), the yield could be improved to 44 and 40 cocoons/dfl, respectively during I and II crops.

RTRS, Dumka

Conservation and utilization programme for Sarihan ecorace was continued and a total of 12,830 dfls were distributed to the farmers.

RTRS, Bhandara

The Station implemented the improved technology of tasar silkworm rearing with the farmers under SHG mode. A total of 60 lakh cocoons were produced by six SHGs in I and II crops. This was about 30% of total cocoons produced in the State.

RTRS, Imphal

Towards improvement of the Oak tasar silkworm, hybridization studies were continued. The average fecundity, hatching, number of cocoons per dfl., average cocoon wt., shell wt., and S.R.% in the backcross (*A. roylei* x *A. pernyi*) x *A. pernyi* were 247 eggs, 79.00%, 62 cocoons, 7.65g, 0.77g and 10.06% respectively. Field trials of the line showed cocoon yield of 56 cocoons per dfl at Kikruma. The Station undertakes conservation of three species of Oak tasar silkworm (*A. proylei*, *A. frithii* and *A. pernyi*) and ten evolved breeds in the Germplasm bank. The pathogen causing Tiger Band disease has been identified as Nuclear polyhedrosis virus. Among five botanicals and four antibiotics tried against Tiger band disease during Apr-June crop, maximum ERR was recorded in P-52 applied silkworms (51.8%) followed by P-27 (49%) against the control (25% ERR). During July-Dec crop, maximum ERR% was recorded in P-44 (28%) followed by P-52 (26%) as against 12% in control.

RTRS, Bhimtal

To develop effective pruning height of host plant (*Q. serrata*) and period, leaf yield was found directly proportionate to the height of the plants, it being maximum in 5 ft high pruning. Avg. weight of ten mature leaves during Spring and Autumn crops remained higher in pruned (5 ft) plants (11.61 & 16.30 g) as against 10.52 & 14.7 g in control (un-pruned). Bioassay studies revealed no

significant difference between the treated (rearing on pruned plants) and control (rearing on un-pruned plants) batches. However, better average SR %(10.35) was observed in treated lots as against 9.84% in control. To obtain early foliage (20-25 days prior to natural sprout) for raising preponed crop, covering of the plants with poly-house was found effective.

RTRS, Batote

The Station has started functioning as P4 Station for the Oak tasar silkworm.

Human Resources Development

A total of 1801 persons were imparted training under different programmes (PGDS-37, Training under Training Initiatives of CSB-1094, Ad-hoc programmes-473, Tribal farmers training under DBT project-197). The nested units extended support for training the farmers under Training Initiatives of CSB.

Extension & Transfer of Technology

Trial of Technology: Trial of Botanical formulation "Jeeven Sudha" for control of viral disease of tasar silkworm was conducted at RTRSs/RECs, as also a large scale trial with 600 farmers in Jharkhand having nucleus and basic seed rearing of 1,20,000 dfls, which has shown encouraging results. The RTRSs have reported gain of 8-10 cocoons/dfl and the DOS, Jharkhand has reported gain of 10-19 cocoons/dfl.

Farmers adoption programme through SHG mode: In order to improve the field production and productivity and in turn the income of the farmers through tasar culture, farmers adoption programme was implemented under SHG mode with assistance under Central Sector Scheme of Central Silk Board. A total of 1152 farmers in 61 SHGs were adopted by the nested units. A total of 58785 dfls were covered under seed rearing, resulting in production of 237347 dfls of commercial seed. The average cocoon yield of 49 cocoons/dfl was obtained.

Sl. No.	Activity	Achievement		
		RTRSs(5)	RECs(7)	Total
1	No. of SHGs formed	34	27	61
2	Total No. of farmers	627	525	1152
3	Seed crop rearing(dfl)	42215	16570	58785
4	Cocoons harvested	1231107	759009	1990116
5	No. of dfls prepared	162670	74677	237347
6	Commercial rearing(dfl)	112227	79062	191289
7	Cocoons harvested	5847040	3609088	9456128
8	Cocoon dfl ratio	52	46	98

Establishment of Tasar Technology Park: In order to exhibit various activities of tasar culture at one platform, RTRS/RECs have established tasar technology park in their farms.

Establishment of Farmers Field School: In order to educate the tasar farmers in improved technology and hence to improve their productivity, four Farmers Field Schools have been established at RTRS Dumka, Baripada, Imphal and REC Palampur. A total of 798 farmers have been benefitted.

Institution Village Linkage Programme (IVLP): Under IVLP, 100 women reelers have been trained on hand operated wet reeling machines installed by RTRS Dumka, Baripada and REC, Palampur. RTRS, Baripada and REC, Palampur have also established Common Facility Centre (CFC) for the benefit of women reelers, who have started producing > 800g of reeled yarn per day as against 250g by traditional methods.

Motivational Programmes: To facilitate the spread of technology awareness among farmers, a total of 84 motivational programmes were conducted, benefitting 5769 farmers.

Tropical units	Temperate units
Field Day: 34(2052 farmers)	Field day: 15(529 farmers)
Farmers Day: 19(1404 farmers)	Farmers Day: 6(260farmers)
Farmers meet cum Exhibition: 6(1302 farmers)	Vichar Goshti: 2(55 farmers)
	Farmers meet cum Exhibition: 2(167 farmers)

Oak Tasar Basic Seed Production Programme: A total of 1.31 lakh dfls of oak tasar silkworm seed has been prepared by the oak tasar units (0.82 lakh dfls by units in North-East and 0.49 lakh dfls by units in North-West regions).

Popularization of rearing on *Quercus serrata*: Considering the crop success (higher survival, ERR-60 cocoons/dfl) achieved by the oak tasar units by rearing on *Quercus serrata*, the DOS of respective states are being pursued for taking up oak tasar silkworm rearing on *Q. serrata*.

● Central Muga Eri Research and Training Institute (CMERTI) Lahdoigarh

Central Muga Eri Research & Training Institute (CMERTI), Lahdoigarh has its hinterland in all the North-eastern states, West Bengal, Uttar Pradesh and Andhra Pradesh. Nested under it are three Regional Stations (Regional Muga Research Station, Boko, Assam and Regional Eri Research Station, Mendipathar, Meghalaya, Regional Eri Research Station, Shadnagar, Andhra Pradesh) with three Research

Extension Centres for muga (Lakhimpur in Assam, Tura in Meghalaya, Coochbehar in West Bengal), five RECs for Eri (Diphu and Kokrajhar in Assam, Fatehpur in UP, Shadnagar in Andhra Pradesh, Navasari in Gujarat and one Composite REC in Mangaldoi, Assam).

Muga host plant improvement

New germplasm bank of muga host plant was established. Approximately, 39 som accessions of plus tree and three genotypes viz., PT-27, PT-11 and PT-16 som plus trees have been found superior in terms of growth characters, leaf yield, disease resistance & rearing performances. Acc003 and Acc 004 have been evaluated as superior genotypes of castor for eri silkworm rearing out of eight castor genotypes. Acc 03 and Acc 04 showed higher leaf yield of 13.79 and 13.38 MT leaf yield/ha/year respectively. Attempts were made to isolate, identify and characterize insect stimulants released from muga silkworm host plants and study its functional properties. Chlorogenic acid, Phenyle Alanine Ammonia Lyase (PAL) activity and Trypsin inhibiting activity were analysed from medium, tender and mature leaves of food plants. Its effect on the feeding efficiency of muga silkworm was studied.

In Eri sector there is only one evaluated variety of castor, NBR-1. To evaluate more suitable castor genotype for eri silkworm, superior genotypes of castor for eri silkworm rearing was evaluated. During the year two more accessions of castor Acc003 and Acc 004 have been evaluated as superior genotypes for eri silkworm rearing out of eight castor genotypes. Acc 03 and Acc 04 showed higher leaf yield of 13.79 and 13.38 MT leaf yield/ha/year, respectively.

Muga silkworm improvement

Endocrine control of vitellogenin synthesis during reproductive cycle & ovarian development was studied. Hormonal control of cerebral neurosecretion during reproduction was reported. Effect of exogenous application of hormone to

enhance fecundity was studied in detail. For domestication of muga silkworm an attempt was made to standardize rearing of muga silkworm using semi-synthetic diets. It is successful upto 3rd instar. Muga silkworm responded to semi-synthetic diet and 86.95% survivability was observed after 48 hours of hatching. Rearing of muga silkworm in unfavourable season is the bottleneck of the growth of the industry. Long time preservation schedule of muga silkworm to skip hazardous season was developed. Effect of preservation of muga seed cocoons on fecundity and hatching was studied and found that preservation upto 62 days (during Jarua crop) and 42 days (during Aherua crop) did not affect the fecundity and hatching against control.

Housefly culture for mass multiplication of *N. thymus* has been stabilized in the laboratory to control uzi fly. Survey was conducted to develop forecasting and forewarning for pest and diseases of muga host plants and silkworm.

RMRS Boko

Seven accessions of muga silkworm collected from different pockets of North-eastern region are being maintained in *ex situ* condition. Muga silkworm hybrids were produced and evaluated. The wild muga accessions RMRS Aa00-1, RMRS Aa00-2 and RMRS Aa00-3 performed better both as line as well as tester with better heterosis and GCA and ASY. Studied performance of six muga silkworm crosses at farmers field and maximum ERR (46.46%) was found in Aa001 x Aa002.

RERS, Mendipathar

Castor plantation and different eri silkworm eco-races has been maintained. High yielding breeds of eri silkworm, *Samia ricini* (Donovan) with higher fecundity and shell weight were developed.

Developmental programmes

Eight Cluster Promotion Programmes, 4 muga (Golaghat and Lakhimpur of Assam, Tura

of Meghalaya and Coochbehar of W.B), 3 eri (Udalguri of BTC, Fatehpur of U.P and Dimapur of Nagaland) and 1 mulberry (Darrang, Assam) were implemented under CDP. 2231 new beneficiaries have been covered under CPP and 1543 beneficiaries have been trained. Besides, different extension programmes like Vanya Reshom Krishimela, Technology Awareness Meet, Exhibition, Field Day, Group demonstration, Workshop etc. were conducted at main institute and regional stations as per Action Plan of the year. Bio-tech Hub at the institute funded by DBT, New Delhi was Established.

Post-cocoon Technology

- **Central Silk Technological Research Institute (CSTRI), Bangalore**

Central Silk Technological Research Institute (CSTRI) has its head quarters at Bangalore and the sub-units spread across the country. CSTRI has 12 Demonstration Cum Technical Service Centres (DCTSC) at Dharwad, Hindupur, Dharmapuri, Palakkad, Jammu, Malda, Suri, Bhagalpur, Varanasi, Dehradun, Bhandara and Cuttack, six Silk Conditioning and Testing Houses (SCTH) at Bangalore, Dharmavaram, Kancheepuram, Jammu, Srinagar and Malda, four Textile Testing Laboratories (TTL) at Bangalore, Jammu, Bhagalpur and Varanasi, one zonal office at Bilaspur, two Raw Silk Testing Centres (RSTC) at Sidlaghatta and Kollegal, two Cocoon Testing Centres (CTC) at Ramnagaram and Coimbatore and one Regional Silk Technological Research Station (RSTRS) at Khanapara.

Eight-end-Multi-end Reeling machine has been designed and developed. It was demonstrated in Ramanagaram, Sidlaghatta and Kolar and was well received. Investigation of the causes of breaks in silk filaments during reeling cocoons reared under high humidity conditions has shown that breaks during reeling occur due to weak structure of the filament itself, at the point of break.

Impact of high humidity during cocoon spinning on colour, sericin chemistry and exfoliation was also investigated. It was found that high humidity influences the colour and sericin characteristics but not the exfoliation in raw silk.

A low cost solar operated spinning machine was developed to improve the quality of hand spun yarn, reduce production cost and drudgery and to make it suitable for physically handicapped / aged persons. A special brush was developed for brushing tasar/muga cocoons before wet reeling. This eliminates the deflossing process, saves time and reduces wastage. Also, the cocoons are prevented from opening up. The exploratory work to develop a low cost sizing machine for tasar yarn, to optimize sizing recipe, to improve smoothness by using suitable softener in sizing recipe and to compare the productivity and quality of fabric produced was taken up.

Trials conducted on improving the dimensional stability of Tasar silk fabrics showed that it was possible to reduce fabric shrinkage by upto 8% without affecting strength and some other properties. The study of pilling resistance of Eri silk knits revealed that the Eri knits from dyed yarn exhibit better pilling resistance than the knits made from un-dyed yarn. Low cost electronic jacquard for handlooms has been successfully developed at the Institute and the same has been demonstrated to the handloom weavers.

Synthesis of nano carbon nitride using silk fibroin and sericin by pyrolysis method was successfully carried out in collaboration with IISc, Bangalore. Mulberry sericin is found to be more effective compared to fibroin in the synthesis of carbon nitride. Silver nanoparticles synthesised using sericin were found to be effective against pathogenic bacteria.

Application of Natural Dyes on different varieties of silk was studied and 72 samples were developed with Mulberry and Eri silk and subjected

to the evaluation of fastness properties. The possibility of flock printing of muga silk fibres along with other fibres like nylon on silk fabric was explored and muga silk was found ideal with mulberry soft silk to create an eco-friendly product. Studies on wash care of *vanya-silk* materials was undertaken wherein laboratory trials were conducted to evaluate shrinkage, appearance, colour change, etc. on dry cleaning and hand laundering.

Product Development / Product Launching Programme

Hybrid fabrics with Mulberry and Eri silks, Denim fabrics and Baby blanket using Eri and mulberry/eri blends, Natural dyed Eri silk stock and mulberry/eri stoles and Stain guard finished sarees and garments have been developed (Garment conversion : blazers, shirts, skirts, etc.). A Product Catalogue was brought out incorporating the details of all the developed garments for men, women and children in various sizes.

Training and Testing

125 persons were trained under capsule and adhoc training programmes on silk reeling, raw silk testing and grading, silk dyeing and printing, silk twisting, powerloom setting and maintenance, designing on dobby and jacquard, silk machinery maintenance, silk weaving and non-mulberry technology. A revenue of Rs. 0.97 lakhs was earned.

665 lots under physical and chemical parameters have been tested at main institute and a revenue of Rs. 4.30 lakh was earned. 256 lots were tested on advisory basis for both physical and chemical parameters.

Under CDP, the main institute along with the sub-units implemented the various schemes of the post-cocoon sector under the XI Plan Catalytic Development Programme (CDP). The details of the physical progress are given in the above table :

Schemes	No. of units
Multi-end Reeling Machines -10 Basins	25
Multi-end Reeling Machines - 20 Basins	3
Assistance for Twisting Units (400 spindles)	57
Master Reelers / Weavers / Dyers assistance	27
Technology upgradation programme	2
Support for establishing shuttle-less looms	10
Support for Handloom Sector - Certified Handlooms	781
Loom upgradation through Jacquards	1428
Computer Aided Textile Designing (CATD)	190
Yarn Dyeing - 25 kg	7
Yarn Dyeing - 50 kg	17
Arm Dyeing - 50 kg	9
Fabric Processing Facilities	7
Additional equipment (Boiler etc)	5
Bench Mark /Cluster survey	2
MRTM	25
MSM	10
RDP	1
TOTAL	2606

Sub Units

The sub units of CSTR I were involved in organising various training programmes, conducting technology demonstrations and field interaction programmes, implementation and monitoring of various XI Plan CDP schemes. The sub units were also involved in adoption of reeling, weaving, twisting and dyeing units for continuous monitoring for overall improvement. Testing services is the other major activity of the sub units. The progress of the sub units during the year is as follows:

TTLs

Sl.No.	Particulars	Nos.
1	Mechanical tests	686
2	Chemical tests	2170
3	Eco tests	341
4	Total tests	3197
5	Total Revenue (Rs.)	1142864
6	Field Programmes	4
7	Tech. Advisory visits	41

SCTHs

SI.No.	Particulars	Nos.
1	Limited test (Filature)	12445
2	All tests (Filature)	555
3	Twist tests	4759
4	Size tests	30885
5	Zari tests	6005
6	Boil-off tests	6213
7	Mechanical parameters	751
8	Chemical parameters	512
9	Other tests	264
10	Total tests	62389
11	Total Revenue (Rs.)	832240
12	Field programmes	45
13	Demonstrations	36
14	Tech advisory visits	90

RSTCs

SI.No.	Particulars	Nos.
1	Limited tests	683
2	Denier tests	66559
3	Total tests	67242
4	Total revenue (Rs.)	374374
5	Field programmes	5
6	Tech advisory visits	18
7	Demonstrations	4

CTCs

SI.No.	Particulars	Nos.
1	Cocoon lots tested	14093
2	Field programmes	16
3	Tech advisory visits	37
4	Demonstration of technologies	5

DCTSCs

SI.No.	Particulars	Nos.
1	Candidates trained	1024
2	Cocoon samples tested for reeling parameters	17400
3	Raw silk samples tested	957
4	Water samples tested	50
5	Total test	19431
6	Total revenue (Rs.)	129500
7	Demonstration of technologies	85
8	Field programmes	111
9	Technical advisory visit	370
10	Adoption	15

CSB SUPPORT SERVICES

● **Training in Sericulture**

The Research and Training Institutes of CSB have been conducting training programmes for officers and officials deputed from the State Departments, Industries, CSB and NGOs. In addition to this, the institutes conduct Adhoc Training Programmes upon specific request from the sponsoring agencies as per their requirement on pre and post-cocoon aspects.

During the period under report, two long term structured courses on “Post Graduate Diploma in Sericulture” one each in mulberry and non-mulberry sectors was conducted at Central Sericultural Research and Training Institute, Berhampore (West Bengal) with 27 candidates and at Central Tasar Research and Training Institute, Ranchi (Jharkhand) with 22 candidates, respectively. 22 Short-Term Capsule Training Courses ranging from 2 to 45 days were conducted in 84 batches for 779 candidates. Besides, 69 Adhoc Courses were conducted in 167 batches at different Research and Training Institutes of CSB offering training to 1593 candidates as per the requirement of the industry, the State Sericulture Departments and other organizations. Besides, 3591 candidates were trained under different Skill Upgradation Programmes and Management Programmes at different institutes. The Adhoc Courses also include Farmers Training Programmes and Skill Up-gradation Programmes for the year 2010-11. The training details during 2010-11 are indicated in the following Table :

Sl. No.	Particulars of Training Courses	2009-10		
		No. of Courses	No. of persons trained	Category of Trainees
1	Structured Courses	2	49	DOS/ NGO
2	Capsule Courses	22	779	CSB/ DOS / NGO
3	Adhoc Courses	69	1593	Entrepreneurs/ Farmers
4	Skill, Technology Upgradation Programmes & Management Programmes	—	3591	Farmers and Officials
	Total		6012	

In order to continue to offer the long-term structured training programmes to the public, the CSB made efforts to obtain affiliation of Universities. The 15-month Post- Graduate Diploma in Sericulture Course for mulberry sector conducted at CSRTI, Berhampore (West Bengal) is affiliated to Kalyani University, Kalyani (West Bengal). The affiliation of Post-Graduate Diploma in Sericulture (non-mulberry) Course conducted at CTRTI, Ranchi (Jharkhand) affiliated to Ranchi University, Ranchi (Jharkhand) is under progress.

Four Gold Medals were awarded to the meritorious candidates of PGDS Course (non-mulberry) at CTRTI, Ranchi during the period under report. They are sponsored by Central Silk Board and State Departments of Sericulture, Government of Andhra Pradesh and Madhya Pradesh respectively. The Chairman and Vice-Chairman Gold Medals sponsored by Central Silk Board were awarded for highest aggregate marks and the other Two Gold Medals were awarded for obtaining highest marks in the paper on Silkworm Rearing Technology sponsored by Government of Andhra Pradesh and for highest marks in papers on Seed Production Technology and Crop Protection Technology sponsored by Government of Madhya Pradesh.

Candidates deputed from the State Departments are charged with course fee at a concessional rate of 50% on each course to cover the cost of course material and consumables. Considering the subsequent problems faced by the sponsored candidates, the concession was extended on accommodation also uniformly by some of the Research and Training Institutes. Revenue generated through the training programmes is satisfactory.

Besides, the six months course on 'Certificate in Sericulture' initiated by the CSB in collaboration with Indira Gandhi National Open University gathered momentum amongst the public who are interested in sericulture. The course material has been developed by the organization through its Scientists and vetted by IGNOU in nine languages catering to the needs of people from different parts of the country. 201 candidates were registered for the course as on date from 10 states through nine Programme Centres from Jammu and Pampore (J&K), Imphal (Manipur), Hosur and Madurai (Tamil Nadu), Nagpur (Maharashtra), Sujapur (Punjab), Dehradun (Uttarakhand) and Itanagar (Arunachal Pradesh). Popularization of 'Certificate in Sericulture' programme at grassroot/ local level through Research and Training Institutes / Stations, Centres of CSB, State Sericulture Department and other institutions involved in sericulture research, teaching and training is in its fore front.

Automatic Reeling machine

With an aim to produce international quality (3A- 4A) raw silk, Govt. of India, under the XI Plan Catalytic Development Programme, has made provision to assist the establishment of Automatic Reeling Machine (ARM) units. The above scheme is aimed at popularizing the adoption of latest technologies in cocoon processing, silk reeling, testing etc.

As many as four Automatic reeling units

that were established in past years (2008-09 & 2009-10) in Karnataka, Tamil Nadu and Andhra Pradesh, got operational during this year and have started commercial production. Ms. Rita Menon, Secretary (Textiles), Govt. of India inaugurated the Ramanagaram ARM unit on 6th December 2010.

Sunset Review for continued imposition of Antidumping duty on Silk Fabric

The anti-dumping duty imposed on Chinese silk fabrics has been in force until May 2011 & it was for a period of 5 years. Considering the request of the domestic powerloom silk weaving industry to protect them from the unscrupulous act of the Chinese silk fabric exporters, a sunset review application for continued imposition of antidumping duty for another term of 5 years has been filed during September, 2010. In order to investigate the case for continued imposition of anti-dumping duty, the Directorate General of Anti-dumping & Allied Duties (DGAD) has issued a Gazette Initiation Notification on 6th December, 2010.

As per the notification the data on injury to the domestic industry, costing details of various silk weaving units of different states, etc., has been made available to the designated authority for verification. The investigation is under progress for continued imposition. Meanwhile the authority has extended the existing antidumping duty on silk fabric till 5th December 2011 as the case is under investigation.

Enterprise Development & Management Development Programmes

Under the Component 'Enterprise Development & Management Development Programmes' during the year 2010-11, a total of 24 training programmes were organized by C&ED Cell covering around 747 participants.

The break-up of the programmes conducted are indicated hereunder:

Sl.No.	Training Progs.	Duration	Location	Progs	Participants
1	Entrepreneurship Dev. Programme	50 Days	Sualkuchi (Assam)	1	25
2	Resource Development Programme	7 Weeks	Sualkuchi (Assam)	3	75
		2 Weeks	Imphal (Manipur)	1	12
		2 Weeks	Guwahati (Assam)	1	23
		2 Weeks	Bhubaneshwar (Orissa)	1	20
		2 Weeks	Kolkata (W.B.)	1	10
		2 Weeks	Dehradun for J&k	1	20
		2 Weeks	Bhubaneshwar (Orissa)	1	25
3	Disciplinary Proceedings Training	4-Days	Bangalore (Kar)	1	22
			Mysore (Karnataka)	1	32
			Berhampore (W.B.)	2	49
			Guwahati (Assam)	1	24
			Ranchi (Jharkhand)	1	25
			Dehradun (UR)	1	24
			Bilaspur (CG)	1	24
4	Management Development Programme	1 Week	Hyderabad (NAARM)	1	30
		3 Weeks		1	35
5	Technology Up-gradation Programme	1-day	Ilakal (Karnataka)	1	175
		2 days	Kargi Kota (CG)	2	75
GRAND TOTAL				24	747

➤ **Beneficiaries Empowerment Programme**

Under this component, during the year 2010-11 a total of 28,832 stakeholders/ farmers have been covered in 19 states incurring a total expenditure of Rs.1375.00 lakh.

➤ **Integrated Skill Development Scheme (ISDS)**

During the year 2010-11, Ministry of Textiles, Govt. of India has launched a new scheme on skill development for the benefit of entire textile sector. Among various other players/member organizations, Central Silk Board has also submitted a comprehensive proposal to GOI for funding. The said proposal envisages to cover around 15000 farmers/artisans/industry stakeholders in next five years with an outlay of Rs.10.43 crore. The sharing pattern suggested under the

scheme is 75:25: Gol:CSB.

Consultancy

Central Silk Board extends Consultancy services to State Dept. of Sericulture, NGOs, Entrepreneurs and other organizations for effective implementation of Sericulture Projects and related developmental activities. CSB expertise in the sericulture field is in demand in the country. The following were executed during the period :

- Refining, Improving and Evaluation of Room Disinfectant for M/s Seri-Gro Products, Bangalore by CSRTI, Mysore
- Testing of Chlorine Dioxide 40000 ppm for Sericare, Bangalore by CSRTI, Mysore
- Ex-post evaluation of JBIC assisted Manipur Sericulture Project (Phase-I) for Government of Manipur by Central Silk Board.

● **Publicity Programmes, Press & Media Relations**

The Central Silk Board has organized a number of press & electronic media publicity programmes during the year 2010-2011. The Publicity programmes includes printing and publishing of publications, advertising through press & electronic media, participation in various exhibitions and trade fairs, organizing press visits, press meets and press conferences, production of video films in various languages and active participation in the public information campaign cum exhibitions organized by Press Information Bureau. The details are as follows:

I. Publications

The Central Silk Board has brought out the following publications as a part of the publicity programmes during the year 2010-11:

A. Annual Administrative Report 2009-10

The Annual Administrative Report of the Central Silk Board was brought out during the month of September 2010. This publication provides complete information about the activities of Central Silk Board and its Research Institutes. This publication contains details about CSB's Organization set-up, support services provided by CSB projects and schemes implemented by CSB, annual silk production and export details.

B. Handbook of Sericulture Technology

The 4th Revised Edition of Handbook of Sericulture Technology was brought out during the month of May, 2010. This publication was compiled and edited by Dr.S.B.Dandin and Dr. K. Giridhar. Huge demand for updated sericulture information has necessitated in bringing out the publication. This Publication contains details about various technologies developed by CSB's Research Institutes. These technologies helped to increase the silk production and productivity. Detailed information was provided about Mulberry cultivation, mechanization under it, Mulberry

diseases & Pests and its control measures, Silkworm races viz., Bivoltine and Multivoltine, its egg production and Hybrid seed production, Disinfection and hygiene practices, Silkworm rearing, Silkworm diseases, Pests and their management, Mechanization in Silkworm Rearing and finally Sericulture Extension, in this publication. This voluminous book of 427 pages is well received by stake holders of Sericulture industry, in general, extension workers and sericulture students in particular.

C. Pattu Valarpu Thozhilnutppa Kaiyedu

The Central Silk Board has brought out a Tamil version of the Hand Book of Sericulture Technology book entitled "Pattu Valarpu Thozhilnutppa Kaiyedu" the tamil language version, during the year 2010-11. The Tamil version was edited and published by Shri J. Sampath, Joint Director (Publicity), CSB, Bangalore. This publication was very much helpful to the Sericulture Farmers of Tamil Nadu to have complete knowledge about the recent sericulture technologies, developed by CSB's Research Institutes. This publication was brought out under CDP publicity programme.

D. Vanya Silk Directory

The Central Silk Board has brought out the Vanya Silk Directory during the month of April, 2010. Smt. Monika S. Garg, Joint Secretary (Silk) Govt. of India released the CSB publication "Vanya Silk Directory" during the two day workshop on Recent Advance in Sericulture. The Vanya Silk Directory provides a complete information on the profile of vanya silk industry in India, about small manufacturers, master weavers, traders, exporters, retailers of vanya silk in different parts of the country, Raw Material Banks, Vanya Silk Shoppees, units of CSB and State Governments working for the development of Vanya Silks, tips on Vanya Silk care etc. This directory is useful to the global silk importers, silk manufacturers and traders.

E. Wild Silks of India Volume-II, Profiles of Farm Activities

The Central Silk Board has published Vanya - "Wild Silks of India" Volume-II, profiles of farm activities during the month of December, 2010. The volume – II profiles of farm activities contains valuable information on host plants cultivation techniques, development and maintenance, silkworm rearing techniques of tasar, eri and muga which includes location, selection for rearing of worms, incubation of eggs, brushing of larvae, chawki rearing, alternative rearing techniques and appropriate late age rearing techniques, handling of spinning worms and harvest of the cocoons and grainage operation techniques etc. This publication is useful to the prospective vanya silk growers and entrepreneurs, policy makers and stakeholders of the industry and serve as a very good reference book on Vanya Silk production.

F. CSB Training Manual 2010-11

The Central Silk Board has brought out a CSB Training Manual for the year 2010-11 which includes information on various training programmes conducted by various Research Institutes of the Central Silk Board nested in different parts of the country for the Academic Year 2010-11. This publication is very much useful to the students and extension personnel working in various sericulture departments, NGOs and voluntary organizations involved in sericulture developmental activities.

G. Recent Advances in Sericulture Research

A Booklet on "Recent Advances in Sericulture Research"- Abstract papers, was published by the Central Silk Board during May 2010. The Hon'ble Union Minister of State for Textiles, GOI, released this during the Two-day Workshop on 'Recent Advances in Sericulture Research' on 18th & 19th May, 2010 at Hotel Radha Regent, Electronic City Phase I, Bangalore.

II. Advertisement through Newspaper

The Central Silk Board has released the newspaper advertisements in the leading English and vernacular dailies highlighting the activities

of Central Silk Board and its Research Institutes during the year 2010-11.

(a) The Central Silk Board has released a half page colour advertisements in Deccan Herald and Prajavani on 18th May, 2010 published from Bangalore highlighting the achievements made by CSB's Research Institutes on the eve of the National Workshop on "Recent Advances in Sericulture" held at Bangalore.

(b) The CSB has released a half a page advertisement in English dailies; Deccan Herald, Times of India and Kannada daily Prajavani on 28th January, 2011 highlighting the research achievements of CSRTI, Mysore about the National seminar on sericulture. This advertisement was released on the eve of the National Seminar on Sericulture-Golden Jubilee Celebration of CSRTI, Mysore.

(c) The Central Silk Board has released newspaper advertisements in Deccan Herald & Samyukta Karnataka (Karnataka editions) and Kannadamma (Belgaum edition) highlighting the activities of the CSB in developing Sericulture. These advertisements were released during the workshop on "Sericulture Industry for the progress of North Karnataka" held on 5th March, 2011 at Belgaum, Karnataka.

III. Production of video Film

As a part of audio visual publicity programme, the Central Silk Board has produced a sericulture video film on 'Large Scale Sericulture Farming', in English during the year 2009-10. This video film was dubbed in Hindi, Tamil, Telugu and Kannada, during the year 2010-11.

This sericulture video film is educational in nature and also provides a complete information on Indian Sericulture and various developmental programmes implemented by the Central Silk Board. Detailed information on on-going CDP programme is also shown in this video film. These video films are useful to the field functionaries of various state Sericulture Departments, particularly in the mulberry silk producing states, involved in sericulture extension.

IV. Press & Media Publicity Activities

(a) Press Relations

The Central Silk Board has organized a number of press conferences and press meets during the year 2010-11. Press meets were organised during (1) National Workshop on Recent Advances in Sericulture Research on 18th May, 2010 at Bangalore, (2) "National Conference on Sericulture" held at Mysore on 28th February, 2011 during the "Golden Jubilee" celebrations at CSRTI, Mysore (3) Krishi Mela function held at Tamil Nadu Agriculture University, Coimbatore on 13th February, 2011 (4) Workshop on Sericulture Industry for the progress of North Karnataka held at Belgaum on 5th March, 2011. The CSB has released a number of press notes during the year 2010-11 highlighting the activities of Central Silk Board. Press communique were released during the visits of various foreign delegations to CSB and sericulture areas.

(b) Participation in Exhibitions and Trade Fairs

The Central Silk Board has participated in a number of exhibitions organized by the Ministry of Agriculture, Govt. of India and Press Information Bureau (PIB), Bangalore, Ministry of Information and Broadcasting, Govt. of India and Multimedia Publicity Information Campaign exhibitions held at various places. The Central Silk Board has participated in the Agri Expo-2010 held between 15th to 18th June, 2010 at Hyderabad. Sericulture Technologies developed by CSB's Research Institutes and Regional Sericultural Research Station, Ananthapur were highlighted in the Agri Expo-2010.

The Central Silk Board participated in Public Information Campaign-cum-exhibition at Tiptur taluk of Tumkur district between 24th to 26th July 2010 and at Pandavapura taluk of Mandya district during 22nd to 24th September 2010 and at Gangavathy, Koppal district of Karnataka during 5th to 7th March 2011. Further, CSB also participated in the exhibition 'Agritech 2010' held at Hyderabad during June 24th to 26th 2010.

Indian Silk

The Central Silk Board continued the publication of **Indian Silk** - the monthly bilingual industrial journal devoted to the sericulture and silk industry of India. Presently, the journal is in its 49th year of publication. During the period, regular attempts were made to enrich its contents for the benefit of its readers.

During the year, **Indian Silk** also brought out:

- Special Issue (January 2011) on the occasion of Golden Jubilee of Central Sericultural Research & Training Institute, Mysore covering in detail the developments in different fields such as mulberry varieties, production technology, silkworm breeds, rearing, mechanization, extension along with opinion of the JICA experts besides the milestones of innovations and achievements supported with picturesque history of the development of the Institute, in last five decades.
- Detailed coverage of the "National Conference on Sericulture: Before & Beyond" organized by the CSRTI, Mysore commemorating its Golden Jubilee and Workshop on "Recent Advances in Sericulture Research".
- A detailed coverage of Silk Mark Expo 2010 held at Bangalore supported with a special feature on new trends in silk fibres and fabrics.
- Published a Special Feature on Legendary Mysore Silk Sarees under the column on Geographical Indications to Silk and Silk Products.
- Coverage of the Inauguration of Automatic Silk Reeling Unit commissioned at Ramanagaram.
- Published a good number of success stories in different fields of sericulture across the country.
- The cover pages of the magazine and the contents have been made more topical and their presentation, more creative.

- Continued with regular columns like Research Briefs, Trade Enquiries & Fair Calendar, National and International Trade events, CSB News and SMOI News, among others.
- Indian Silk continued to be indexed in selected national and international abstract services which ensure wide publicity to the journal, both inland and abroad.
- Further, ISU was actively involved in monthly updation of the contents for the CSB's website about the magazine, its contents, subscription and advertisement, for the benefit of visitors. It is also involved in designing of new website of CSB.
- ISU got the rolling shield for effective implementation of OL Policy.
- **Silkworm Seed Production and supply Mulberry Seed**
- **National Silkworm Seed Organization (NSSO)**

Silkworm seed is the lifeline of sericulture and seed sector which plays a vital role in the country's pursuit for sustained sericulture development. National Silkworm Seed Organization (NSSO) is engaged in production and supply of quality silkworm seed in the country. Notwithstanding the prominent presence of private sector in cross breed silkworm seed production,

NSSO produces about 11% of India's total mulberry silkworm seed requirement and this is substantial considering the fact that an equal quantity (14%) is shared by all the state departments involved in mulberry sericulture. NSSO has positioned itself as a leader over the years in bivoltine silkworm seed production by producing about 45% of the country's requirement. The silkworm seed of NSSO is produced in its ISO certified seed production units spread over various parts of India and much sought after owing to its superior quality. NSSO shoulders the responsibility of maintenance and supply of basic silkworm seed. The whole gamut of NSSO activities and the progress made during 2010-11 is outlined as follows:

Basic Silkworm Seed Production

The strength of seed production invariably depends on the quality basic seed generated year after year by the 21 Basic Seed Farms (BSFs) of NSSO. These BSFs characterize seed organization for basic seed maintenance and multiplication of stocks of approved breeds. All the BSFs are manned by technical experts at scientist's cadre and the quality is assured and constantly monitored. The BSFs are categorized into P3 and P2 and supported by one Centre of Sericulture Development. During the year, 9.88 lakh basic seed of both bivoltine and multivoltine breeds were produced of which 8.34 lakh dfls were supplied as detailed in Table-1.

Table 1: Details of basic seed production at various levels

Breeds	Level (Production in number)				
	P4/Stock	P3	P2	P1	Total
Production					
Bivoltine		180	25694	686464	712338
Multivoltine	660	1866	17009	255855	275390
Total	660	2046	42703	942319	987728
Supply					
Bivoltine		10	12028	548606	560644
Multivoltine		663	17309	254981	272953
Total		673	29337	803587	833597

Commercial Seed Production

NSSO has nineteen state-of-the-art Silkworm Seed Production Centres (SSPCs) under its ambit to produce quality F1 disease free laying (dfls). The major thrust in these professionally managed centres is to produce dfls of assured quality for ensuring better quality cocoon crops at farmers' level. During the year, NSSO produced 293.44 lakh dfls of different combinations against the target of 310 lakh dfls. Out of this, 86.91 lakh dfls were of bivoltine hybrids which included 8.23 lakh dfls of traditional hybrids, 34.29 lakh dfls of CSR hybrids, 43.89 lakh dfls of double hybrid and 0.50 lakh dfls of new hybrids. The Multi x Bivoltine dfls production was 206.53 lakhs. The production status for the current year vis-à-vis to that of 2009-10 in major SSPCs in different states is presented in Figure-1. NSSO supplied 91.51 lakh dfls of bivoltine hybrids to various state departments and CSB units during the year.

Dfls production quality parameters

NSSO attaches utmost importance to quality parameters in its seed production centres which is considered as the hall mark of the organization. During the year, the average dfls recovery was 30.19% for multi x bivoltine hybrids in the southern zone against the bench mark of 28%. In the case of bivoltine dfls production, the average egg yield per kg of seed cocoons was 60.99 g in CSR hybrids and 65.31g in double hybrids in the southern zone against the norms of 60 and 65 g, respectively.

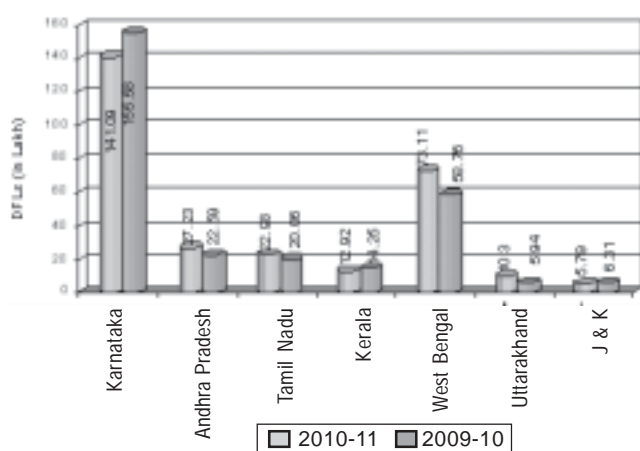


Figure1: State-wise production status of dfls for the years 2010-11 against that of 2009-10.

Generation of Seed Cocoons

To create a viable farmer-oriented enterprise model in seed sector, NSSO introduced the concept of Adopted Seed Rearer (ASR) for the generation of quality seed cocoons. Under this highly successful model, the SSPCs adopt well experienced silkworm rearers after careful examination of the skill and infrastructure facilities. High quality P1 seed produced by the NSSO is supplied to ASRs and seed crops are monitored on a continuous basis providing regular technical advice. These seed cocoons are purchased by SSPCs at a price based on quality parameters fixed by NSSO. The assured market and the quality linked pricing system encouraged the ASRs to strive constantly for generating the dependable seed cocoons.

357.54 lakh cocoons were procured by the SSPCs for both bivoltine hybrid and cross breed dfls production. SCPC, K.R. Pet supplied 60.76 lakh seed cocoons to SSPCs, DOS and LSPs of West Bengal and SSPCs of South India. SCPCs of multivoltine seed areas viz., Kunigal and Denkanikottai continued to support the seed production sericulture industry in a spectacular manner. SCPC Denkanikottai distributed 60913 Pure Mysore and Nistari P1 dfls, generated 203.35 lakh seed cocoons at an average yield of 41.51 kg/100 dfls and supplied 239.46 lakh seed cocoons to SSPCs. SCPC, Kunigal procured 219.14 lakh of Pure Mysore seed cocoons for supply to SSPCs of South India as per the requirement from Pure Mysore seed area in Karnataka. In addition, the concept of ASRs for multivoltine is introduced during this year in Karnataka and Andhra Pradesh and the results are encouraging in more than one way as it improved the egg recovery in SSPCs from the seed cocoons generated along with assured seed cocoon supply.

Extension and Training

NSSO plays a crucial role in giving extension support and technical advice to the commercial sericulture farmers through its Sericulture Service Centres (SSCs) and Sericulture Service Units (SSUs). These extension windows primarily act as centres of dfls supply, produced by the SSPCs

of NSSO. During the year, 32 SSCs and 32 SSUs supplied 207.87 lakhs of dfls in various parts of the country which included 31.19 lakh bivoltine hybrid dfls.

NSSO also evolved viable business mode of franchising the supply of dfls through CRCs. The franchisees procure the dfls from the parent SSPC, chawki rear them in the facilities for which partial financial assistance is offered, and supply it to the catchment area farmers. 52 such franchisees procured 46.69 lakh dfls, chawki reared them and supplied which included 30.12 lakh multi x bivoltine dfls and 16.57 lakh bivoltine hybrids.

NSSO coordinated study tour of 174 farmers, students and officers from various parts of the country to sericultural areas of Karnataka. Apart from this, NSSO coordinated various training programmes for officials of NSSO, DOS and other agencies including Third Country training programme in seed production and technology under JICA for 54 persons from different countries.

ISO Certification

NSSO has the distinction of providing quality silkworm seed, being the only organization in the country having ISO certification in mulberry silkworm seed production. Eighteen SSPCs are currently maintaining ISO 9001:2008 Quality Management System.

Implementation of Central Silk Board (Amendment) Act, 2006

During 2010-11, NSSO took up the daunting task of implementation of CSB (Amendment) Act,

2006 in the whole of India and organized training to Seed Officers and Seed Analysts after nomination and finalization of their operational jurisdiction. NSSO also formulated the implementation guidelines and creating awareness among various stake holders. To accomplish the task, the following technically oriented functions were carried out:

- 'Manual on Seed Act Implementation for Seed Officers and Seed Analysts' was prepared and published.
- A 'Tutor CD' was prepared containing the topics related to the implementation of Central Silk Board (Amendment) Act, 2006 for the use of trainers of Seed Officers and Seed Analysts in 8 accredited laboratories, across the country.
- Operational jurisdiction was fixed for 63 Seed Analysts and 295 Seed Officers covering all the four varieties of silk across the country, based on the density of seed production activities.
- Conducted the trainers training programme for the representatives of 8 accredited laboratories at Bangalore.
- Coordinated the training of 358 SOs and SAs in 8 accredited laboratories, across the country.
- Conducted scrutiny of 628 applications received for registration as seed producer and chawki rearer, based on their technical feasibility. Registration certificates were issued to 334 seed producers and 57 chawki rearers (Table 2).

Table 2. State-wise registration status of entrepreneurs

State	Seed Production Centres		Chawki Rearing Centres	
	Mulberry	Vanya	Mulberry	Vanya
Andhra Pradesh	4			
Bihar	1	3		
Jammu & Kashmir	10			
Jharkhand		1		
Karnataka	211		36	
Kerala	1			
Madhya Pradesh		42	19	
Maharashtra	1	45		
Tamil Nadu	15		2	
Uttarakhand	1			
West Bengal	3			
Total	247	91	57	

Tasar Seed

A. Tropical tasar

● Basic Tasar Silkworm Seed Organization (BTSSO)

In order to organize the systematic seed production and supply of Tropical Tasar, a Basic Tasar Silkworm Seed Organization (BTSSO) is functioning at Bilaspur, Chhattisgarh. Under the BTSSO, a Central Tasar Silkworm Seed Station (CTSSO) and 21 Basic Seed Multiplication & Training Centres for Tropical Tasar (BSM&TCs) are functioning in different states.

Central Tasar Silkworm Seed Station (CTSSS)

A Central Tasar Silkworm Seed Station (CTSSS) is functioning at Kota in Chhattisgarh for production and distribution of tasar nucleus seed to BSM&TCs for further multiplication. The Station is also maintaining germplasm of different silk-worm races. The table below indicates the nucleus seed produced/supplied by the unit during the years from 2008-09 to 2010-11. A Field Unit of CTSSS is functioning at Sihora.

Year	Dfls Production (Lakh Nos)
2008-09	1.21
2009-10	0.71
2010-11	0.42

Basic Seed Multiplication & Training Centres for Tropical Tasar

Progress of BSM&TCs functioning in different states during the years from 2008-09 to 2010-11 is as follows:
(dfls in lakh Nos.)

Sl.No.	State	No. of BSMTCs	2008-09	2009-10	2010-11
1	Jharkhand	4	5.58	3.33	4.10
2	Chhattisgarh	5	10.97	9.42	12.48
3	Madhya Pradesh	1	2.57	2.56	2.33
4	Orissa	4	6.34	5.49	5.79
5	Andhra Pradesh	3	2.16	3.14	1.82
6	Maharashtra	1	0.95	1.14	1.02
7	West Bengal	1	2.52	2.46	1.99
8	Uttar Pradesh	1	0.67	0.93	1.12
9	Bihar	1	1.37	0.70	0.84
Total		21	33.13	29.17	31.49

B. Oak Tasar

Oak Tasar seed production is undertaken in two RTRs, one oak tasar grainage, two RECs and three REC cum BSM&TCs functioning in 5 States. The combined progress achieved by these units during the years from 2008-09 to 2010-11 is as follows:

(dfls in lakh Nos.)

Sl.No.	State	No. of RTRs/RECs/ REC cum BSMTCs	Years 2008-09	2009-10	2010-11
1	Manipur	2	1.62	1.40	1.31
2	Nagaland	1			
3	Assam	1			
4	J&K	2			
5	Uttarakhand	2			
Total		8	1.62	1.40	1.31

C. Muga seed

● Muga Silkworm Seed Organization (MSSO)

The Central Silk Board had implemented a Muga Seed Development Project between 1983-84 & 1987-88. Under this project, two P4 and five P3 Muga Seed Stations were established under Central sector and ten P2 seed centers and 6 reeling units were established under State sector. After completion of the project period, the infrastructure created under State sector have been handed over to the respective State Governments for further maintenance and the units created under Central sector have been reorganized as MSSO and maintained by CSB. The MSSO has two P4 units, six P3 units for production of basic seed and one Muga Silkworm Seed Production Centre for the production of commercial seeds.

Muga Basic Seed Stations

The performance of Muga Basic Seed Stations during the years from 2008-09 to 2010-11 is as follows:

(dfis in lakh Nos.)

State	No. of P4/P3 units	2008-09	2009-10	2010-11
Meghalaya	5	0.42	0.58	0.96
Assam	2	0.19	0.26	0.20
Arunachal Pradesh	1	0.00	0.02	0.04
Total	8	0.61	0.86	1.20

● Muga Silkworm Seed Production Centre

One Muga SSPC is functioning at Kaliabari, at Boko in Assam. The seed produced by the SSPC during the years from 2008-09 to 2010-11 is as follows:

Year	Production of dfis in lakh
2008-09	0.53
2009-10	0.62
2010-11	1.54

D. Eri Seed:

● Eri Silkworm Seed Organization (ESSO)

To organize the production and supply of Eri seed, an Eri Silkworm Seed Organization (ESSO) is functioning at Guwahati, Assam. The ESSO has one Eri SSPC in NE region. The ESSO has organized 4 Eri SSPCs in non-traditional States, one each at Hosur (Tamilnadu), Fatehpur (UP), Shadnagar and Peddapuram (Andhra Pradesh) by re-organizing the existing units of CSB.

The progress achieved by the SSPCs during the last three years from 2008-09 to 2010-11 is given below:

(dfis in lakh Nos.)

SI.No.	Location of ESSPC	2008-09	2009-10	2010-11
1	Azara (Assam)	0.56	0.61	0.94
2	Hosur (Tamilnadu)	0.18	0.39	0.48
3	Fatehpur (UP)	0.38	0.37	0.56
4	Peddapuram (AP)	0.33	0.29	0.38
5	Shadnagar(AP)	0.17	0.29	0.23
	Total	1.62	1.95	2.59

E. Market Support

• Tasar Raw Material Bank, Chaibasa

A Raw Material Bank for Tasar is functioning at Chaibasa (Jharkhand) along with 4 Sub-depots, one each at Raigarh (Chhattisgarh), Bhagalpur (Bihar), Warangal (AP) and Bhandara (Maharashtra). The primary objective of RMB is to ensure economic and fair price to the primary tasar growers. The details of procurement and sale of tasar cocoons made by RMB, Chaibasa and its sub-depots during the years from 2008-09 to 2010-11 are as follows:

(Unit: Qty.in lakh Nos. & Value in Lakh Rs.)

Year	Procurement		Sale	
	Qty.	Value	Qty.	Value
2008-09	198.87	140.97	135.40	97.30
2009-10	169.77	117.33	173.57	130.47
2010-11	159.22	101.71	207.37	157.15

• Muga Raw Material Bank, Sibsagar

A Muga Raw Material Bank is functioning at Sibsagar in Assam with 3 Sub-Depots, at Dhakukhana, Sualkuchi (Assam) and Coochbehar (W.B) with the objective of ensuring economic and fair price to the actual muga cocoon producers. The details of purchase and sale of muga cocoons made by MRMB, Sibsagar and its Sub-Depots during the years from 2008-09 to 2010-11 is as follows:

(Unit: Qty.in lakh Nos. & Value in Lakh Rs.)

Year	Procurement		Sale	
	Qty.	Value	Qty.	Value
2008-09	4.79	3.39	4.79	4.23
2009-10	4.02	3.02	4.02	3.29
2010-11	4.919	3.80	4.919	4.23

F. Eri Raw Material Bank, Hyderabad

For the sustained development of Ericulture and to safe guard the interest of poor farmers and

spinners in the new areas, CSB has established an Eri Raw Material Bank (ERMB) at RDO, Hyderabad with procurement centers at Rampachoodavaram, Hyderabad and Chennai. The cocoons thus procured are converted into mill spun yarn and noil yarn in the Post-cocoon Technology (PTC) wing of CSTRI. The yarn is later sold in the market.

The details on purchase of cocoons and sale of yarn by the ERMB during the years 2007-08 to 2009-10 are given below.

(Unit: Qty.in kgs & Value in Lakh Rs.)

Year	Cocoon Procurement		Sale	
	Qty.	Value	Qty.	Value
2007-08	35086.00	17.81	944.26	12.75
2008-09	0.00	00.00	76.97	0.51
2009-10	–	–	98.16	1.33
2010-11	–	–	702.50	9.85

• Pre-shipment Inspection & Issual of various Tariff Certificate

- Compulsory Pre-shipment Inspection of Natural silk goods for export by CSB has been dispensed with effect from 01-04-2000 as per the direction of Ministry of Textiles. However, CSB continues to be inspection authority for silk goods. CSB is undertaking Voluntary quality inspection against payment of service charges prescribed by the Board. Various Tariff Certificates including GSP are certified by CSB on inspection of silk goods and on self declaration by the Exporters.
- Silk Waste Inspection and Certification meant for Export also forms a part of the services offered by the Board.
- 100% Silk Pile Carpet inspection under "Silk Mark" Label Scheme has been suspended w.e.f. 07-10-1999 as per the direction received from Ministry of Textiles, Govt. of India, New Delhi vide letter No F.N. 120111093- Silk dated 07-10-1999. However, Central Silk Board is undertaking

Carpet Inspection under this scheme on voluntary basis as an Export Promotion measure, whenever the exporter or Importer makes a request to Central Silk Board. Silk Mark Labels are affixed on the 100% Natural Silk Pile Carpets. The brand is well established with consumers abroad.

- During the year 2010-11 natural silk / mixed silk goods certified for exports by the Certification Centres of CSB under Voluntary Quality Inspection scheme amounted to 103.05 lakh sq. mts valued at Rs 54441.90 lakh. Various tariff certificates including GSP for which certificates are issued by the Board under self declaration and on inspection, revenue generated amounted to Rs 28.97 lakhs during the year 2010-11.
- Analysis of the export data of natural silk / mixed silk goods certified under voluntary quality inspection scheme comprising of natural silk product like fabric, scarves stoles, sarees, ready made garment, ties, cushion covers etc indicate that product like silk fabric enjoys major exports to U.S.A. followed by Germany and other European countries. However, sarees exports forms a major part to Asian countries like Malaysia, Singapore and U.A.E. etc.

2. Issual of various Tariff Certificates

- To enable foreign importers to avail duty free or concession in duty for the import of natural silk / mixed silk products in their country. Under the EXIM Policy and Bi lateral agreements various tariff certificates viz. Hand looms certificate to E.E.C., Handicraft certificate to E.E.C., Handicraft certificate to Australia, Austria, Switzerland tariff certificate, certificate of Origin and other Special Certificate of origin to 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 prescribed by the Board.

- Handloom fabrics also enjoys a special privilege for duty concession at import destination offered by EEC Countries.

3. Testing Facilities

Extending testing services for checking silk quality physical/chemical properties and other parameters of testing through laboratories attached to Certification Centres of the Board. Analysis of sample swatches of Silk, Identification of constituent fibres, percentages etc.

Extend technical assistance in identifying Silk Constituent Yarn and percentage of Silk content in Silk products as and when approached by different organization like Customs Department, Directorate General of Foreign Trade Import and Export, DOS and other Textiles Institutes and Institutions.

Centre-wise silk / mixed silk goods certified under voluntary quality inspection scheme during 2010-11 as detailed below:

Silk Exports Certified by CCS of CSB during the year 2010-11

(QTY: Lakh Sq.Mts, VALUE: lakh Rs)

Certification Centre	2010-11	
	Quantity	Value
Mumbai	6.76	4583.4
Bangalore	71.47	28119.2
New Delhi	2.64	12323.7
Kolkatta	17.61	6066.0
Chennai	2.55	3103.8
Varanasi	2.02	59.1
Bhagalpur	0.00	0.0
Srinagar	0.18	191.9
Hyderabad	0.00	0.0
Grand Total	103.23	54447.1

Revenue generated by way of extending service to the various institutions and exporting community for the year 2010-11 detailed as under:

Revenue Generated by C.C.S OF CSB during the year 2010-11

(Value : Lakh Rs)

Certification Centre	2010-011
Mumbai	2.24
Bangalore	15.09
New Delhi	3.53
Kolkotta	5.93
Chennai	1.37
Varanasi	0.4
Bhagalpur	0.00
Srinagar	0.36
Hyderabad	0.00
Grand Total	28.92

● **Silk Mark Organization of India (SMOI)**

Under Quality Certification Systems , the Silk Mark Scheme was launched in June 2004. The scheme is being implemented by Silk Mark Organization of India under Central Silk Board, Ministry of Textiles Govt. of India . Since its launch till 2010-11, SMOI has a Membership of over 1700 Members and around 1.20 crores of Silk Mark labeled products have reached the market which has helped the consumers significantly in identifying Pure Silk.

Objectives of SMOI :

- To familiarize the Silk Mark Logo and vouch for the purity.
- Create awareness amongst general public and customers about silk and its purity aspects.
- Build Brand equity of Indian Silk Internationally by networking.
- Sustaining Silk Mark through intensive

publicity, mass communication, participation in the International Fairs, Buyers/Sellers meet and Exhibition etc.

During 2010-11 under XI Plan 302 New Members were added to SMOI, 301 Members were registered as Authorized Users of Silk Mark and over 27.63 Lakh of Silk Mark labeled products reached the market.

SMOI participated in various exhibitions and conducted awareness programme for consumers and trade across the country to promote the Silk Mark.

During the year 2010-11 SMOI had participated in as many as 363 Exhibitions / Workshops and Road Shows

Silk Mark Achievement for 2010-11

Sl. No.	Particulars	Achievement
1	No. of Members enrolled	302
2.	No. of Authorised Users	301
3.	Sale of Silk Mark Label (in lakhs)	27.63
4.	No. of Programmes/ Events/Road shows	363

During 2010-11 SMOI organized 16 Silk Mark Expos on self financing and self supporting basis at Guwahati, Bhubaneshwar, Kolkata, Kochi, Lucknow, New Delhi, Pune, Mangalore, Chennai, Bangalore, Chandigarh, Jaipur, Mumbai and Hyderabad.

These expos provide an excellent opportunity to common consumers to source pure silk products from Authorized Users of different silk clusters of the country under one roof and at the same time the Authorized Users get a platform to display and sell their silk products. During the expo Vanya Silks were also promoted through Vanya Silk Market Promotion Cell of the Central Silk Board.

SERICULTURE STATISTICS

SERICULTURE STATISTICS

● Raw Silk Production

India is the second largest producer of Silk in the world. All the five kinds of silks namely Mulberry, Oak Tasar, Tropical Tasar, Eri and Muga are produced in the country. Annual silk production of the country on an average is about 20,000 MT and foreign exchange earnings from silk goods exports are around ₹ 3000 crore. Central Silk Board collects, compiles and publishes Sericultural Statistics on all aspects of sericulture industry of the country.

During the year 2010-11 a total production of all varieties of raw silk was 20410 MT compared to the production of 19.690 M.T. in the year 2009-10, indicating an increase of 3.7%. Production of mulberry raw silk during 2010-11 was 16,360 MT compared to the production of 16,322 MT in the year 2009-10, indicating an increase of 0.2 %.

RAW SILK PRODUCTION IN THE COUNTRY				
Unit: Raw Silk, MT				
Sl. No.	Variety	Achievement		Incr./Decr
		2010-11	2009-10	over 2009-10(%)
I	Mulberry Plantation (Lakh ha)	1.70	1.84	-7.3
II	Mulberry			
	Bivoltine	1400	1200	16.7
	Cross Breed	14960	15122	-1.1
	Mulberry Total	16360	16322	0.2
III	Vanya Silk			
	Tasar*	1166	803	45.2
	Eri	2760	2460	12.2
	Muga	124	105	18.1
	Vanya Total	4050	3368	20.2
	Grand Total	20410	19690	3.7

* includes both Tropical and Oak Tasar

Production of Vanya silk viz., Tasar, Eri and Muga raw silk during 2010-11 were 1166, 2760 & 124 MT respectively over corresponding figure of 803, 2460 and 105 MT in the year 2009-10, indicating an increase of 45.2% in Tasar, 12.2% in Eri and 18.1 % in Muga. State wise Mulberry and Vanya silk production statistics for the year 2010-11 are given in Annexure (a) & (b).

Mulberry area, raw silk production, productivity of raw silk per hectare and variety wise Vanya Silk production for the last three years are in graphs 1a, 1b, 1c,1d & 1e and 2a, 2b & 2c.

Silk Price

A) Mulberry Sector

Transaction of Raw Silk in Karnataka State

During the year 2010-11, the total quantity of all varieties of mulberry raw silk viz., Filature/Cottage Basin, Charka and Dupion transacted in the silk exchanges of Karnataka was 1036.95 MT valued at

₹ 20841.64 lakh compared to the transaction of 1084.42 MT. valued at ₹ 15825.71 lakh during the year 2009-10.

- (i) The total quantum of Filature/Cottage Basin raw silk transaction in the year 2010-11, was 755.84 MT valued at ₹ 16,064.31 lakh indicating an increase of 4.2% in quantity terms and an increase of 39.6% in value terms as compared to the transaction of 725.50 MT valued at ₹ 11,509.77 lakh during the year 2009-10.
- (ii) The total quantum of Charka raw silk transaction in the year 2010-11 was 194.35 MT valued at ₹ 3813.84 lakh indicating a decrease of 14.6% in quantity terms and an increase of 12.8 % in value terms as compared to the transaction of 277.68 MT valued at ₹ 3379.74 lakh during the year 2009-10.
- (iii) The total quantum of Dupion raw silk transaction in the year 2010-11 was 86.75

MT valued at ₹ 963.49 lakh indicating a decrease of 29.5% in quantity term and an increase of 2.9% in value terms as compared to the transaction of 122.97 MT valued at ₹ 936.20 lakh during the year 2009-10.

Bangalore Silk Exchange

This is a largest exchange in Karnataka contributing around 35.2% of the total raw silk transaction in Karnataka. A total quantity of 365.18 MT of all varieties of raw silk valued at ₹ 7085.78 lakh was transacted during 2010-11 indicating a decrease of 20.1% in terms of quantity and an increase of 14.2% in value terms as compared to the transaction of 457.22 MT valued at ₹ 6203.57 lakh in the year 2009-10.

The variety wise quantum of raw silk transacted in all the silk exchanges of Karnataka during the year 2010-11 as compared to the year 2009-10 is given below:

(Qty: MT)

Month	Filature/ Cottage Basin		Charka		Dupion	
	2010-11	2009-10	2010-11	2009-10	2010-11	2009-10
Apr	61.44	60.29	19.34	24.34	6.43	13.25
May	57.56	61.79	18.20	19.27	7.98	15.05
Jun	55.41	59.33	19.17	17.75	9.51	10.94
Jul	65.63	59.19	16.63	20.98	9.76	12.38
Aug	65.65	57.93	15.80	14.47	7.83	10.38
Sept	55.07	57.63	15.02	15.97	7.83	9.05
Oct	60.34	64.29	14.97	21.75	6.57	9.40
Nov	53.82	54.83	11.48	21.47	7.02	9.82
Dec	63.29	58.78	9.48	15.98	7.645	10.285
Jan	54.21	63.13	11.35	14.79	5.85	10.02
Feb	51.04	60.08	11.22	12.99	4.399	5.58
March	112.38	68.23	31.70	27.94	5.921	6.825
Total	755.84	725.50	194.35	227.68	86.75	122.97

● **Prices of Raw silk and cocoons : 2010-11**

The prices of all varieties of raw silk transacted at Bangalore Silk Exchange during the year 2010-11, as compared to the year 2009-10, is given below:

(₹/kg)

Month	Filature / Cottage Basin		Charka		Bivoltine	
	2010-11	2009-10	2010-11	2009-10	2010-11	2009-10
Apr	1729	1430	1615	1349	1019	1384
May	1750	1442	1664	1385	694	1392
Jun	1800	1439	1681	1409	989	1417
Jul	1887	1488	1743	1350	971	1358
Aug	1970	1532	1838	1522	922	1513
Sept	2210	1479	1522	1608	1005	1427
Oct	2233	1556	2157	1560	1034	1469
Nov	2248	1648	2166	1645	1200	1542
Dec	2545	1847	2538	1743	1251	1619
Jan	2735	1654	2524	1710	1420	1606
Feb	2707	1679	2601	1724	1562	1586
March	2067	1684	1902	1531	1426	1562
Wt. Avg. Price	2149	1561	2070	1525	2023	1482

The Filature / Cottage Basin raw silk price during the year 2010-11 at Bangalore Silk Exchange was ₹ 2149/- per kg showing an increase of 37.7% as compared to the price of the same during the year 2009-10 which was 1561 /- per kg.

The Charka raw silk prices during the year 2010-11 was ₹ 2070 /- per kg indicating an increase of 35.7% when compared to the price of the same with previous year prices i.e., ₹ 1525 /- per kg.

The Bivoltine raw silk prices during the year 2010-11 was ₹ 2023 /- per kg which is also showing an increase of 36.5% as compared to the price of the same during the year 2009-10, which was ₹ 1482 /- per kg.

Transaction of Reeling Cocoons in Karnataka State

(i) Transaction

Quantum of Bivoltine and Cross Breed reeling cocoons transaction in Karnataka markets during the year 2010-11 along with the comparative figures for the year 2009-10 is given below:

(MT)

Month	2010-2011				2009-2010			
	Imp. C.B.	Bivoltine Hybrids	Others	Total	Imp. C.B.	Bivoltine Hybrids	Others	Total
Apr	2833.34	85.99	127.969	3047.30	3439.35	87.03	144.983	3671.36
May	3909.51	73.96	176.289	4159.76	3990.22	88.34	193.217	4271.77
Jun	4008.75	99.45	133.320	4241.51	4461.60	99.75	194.641	4755.99
Jul	4444.65	141.37	145.388	4731.40	4576.70	120.57	209.761	4907.03
Aug	3979.03	168.67	191.468	4339.162	3563.06	130.45	180.254	3873.77
Sept	3740.60	178.88	191.688	4111.16	3771.37	99.05	179.841	4050.26
Oct	4181.89	204.88	138.768	4525.54	4275.68	151.56	174.661	4601.90
Nov	4327.50	213.97	180.196	4721.66	4119.39	176.97	163.776	4460.14
Dec	3256.72	197.66	106.136	3560.52	2941.65	154.26	101.869	3197.78
Jan	3456.78	179.58	88.440	3724.79	3988.81	228.43	119.024	4336.26
Feb	3433.69	182.91	106.239	3722.84	4052.87	241.04	113.280	4407.19
March	4763.16	251.23	133.542	5147.93	4807.39	215.78	140.536	5163.71
Total	46335.6	1978.5	1719.443	50033.6	47988.1	1793.2	1915.843	51697.10

Transaction of Bivoltine Hybrids cocoons at Ramanagaram market and Cross Breed reeling cocoons at Ramanagaram, Sidlaghatta and Kolar markets in Karnataka for the years 2010-11 and 2009-10 are in graphs 3a & 3b.

(ii) Prices

The average prices of Bivoltine hybrid Reeling cocoons (CSR) at Ramanagaram market and Improved Cross Breed Reeling cocoons at Ramanagaram, Sidlaghatta & Kolar markets of Karnataka State during the year 2010-11 as compared to the year 2009-10 are given below :

(Unit : ₹ / kg)

Month	Bivoltine		Improved Cross Breed					
	Ramanagaram		Ramanagaram		Sidlaghatta		Kolar	
	2010-11	2009-10	2010-11	2009-10	2010-11	2009-10	2010-11	2009-10
Apr	223	180	185	160	200	180	187	169
May	249	190	197	156	223	181	185	167
Jun	249	189	198	153	219	171	204	161
Jul	245	176	193	143	211	158	188	140
Aug	271	201	217	162	221	180	213	172
Sept	279	195	226	155	259	169	230	156
Oct	275	199	234	167	259	179	240	172
Nov	254	208	211	175	227	171	212	151
Dec	362	240	309	206	304	203	278	189
Jan	380	232	320	197	317	202	301	189
Feb	369	230	306	194	308	198	303	194
March	268	223	228	185	245	200	238	188
Wt. avg.	285	205	235	171	249	183	232	171

The weighted average price

The weighted average prices of reeling cocoons have shown an increasing trend in the year 2010-11, compared to previous year average prices. The weighted average prices per kg of Bivoltine hybrid Reeling cocoons (CSR) transacted at Ramanagara market increased by 39.0% (₹ 285/kg) when compared to previous year prices (₹ 205/kg). The weighted average prices of Improved Cross Breed reeling cocoons transacted at Ramanagaram, Sidlaghatta & Kolar markets of Karnataka indicated an increase of 37.4% (₹ 235/kg), 36.1% (₹ 249/kg) and 35.7% (₹ 232/kg) when compared to previous year prices of ₹ 171/kg, ₹ 183/kg, and ₹ 171/kg, respectively.

The prices of Bivoltine hybrid cocoons (CSR) at Ramanagaram and improved Cross Breed reeling cocoons at Sidlaghatta markets are also shown in graphs 4a & 4b respectively.

B. Vanya Silk

Prices of Vanya Cocoon and Raw Silk viz., Tasar, Eri and Muga in important markets of Vanya silk producing States for the year 2010-11, along with comparative figures of 2009-10, is given below: (₹/kg)

Variety	2010-11	2009-10
A) TASAR - Champa Market, (Chhattisgarh)		
i. Reeling Cocoon (1000'nos)		
a) Raily	2200-2800	2200-2600
b) Daba	1050-1150	950-1050
ii. Reeled Yarn	2200-2400	1550-2150
iii) Ghicha Yarn	1500-1600	1300-1400
B) ERI (Guwahati)		
i. Cut Cocoons	400-480	220-500
ii. Spun Yarn	900-1200	800-1200
C. MUGA (Guwahati)		
i. Reeling Cocoon (1000'nos)	900-1200	900-1300
ii. Silk Yarn	6500-8000	8000-10000

C. Imported Prices of Chinese Raw Silk

Landed and sale Prices of imported Chinese Mulberry Raw Silk during the year 2010-11, compared to 2009-10, in US \$ are given below:

(Unit : US\$/kg)

Month	2010-11				2009-10			
	Landed price *		Sale price **		Landed price *		Sale price **	
	Min	Max	Min	Max	Min	Max	Min	Max
April	34.00	34.00	44.65	44.65	22.50	22.50	30.80	31.51
May	35.00	35.00	45.16	45.60	22.50	22.50	30.67	31.89
June	35.00	35.00	45.65	46.95	23.50	23.50	31.60	32.35
July	35.00	35.00	49.08	51.66	25.00	25.00	32.25	34.85
August	N.A		52.92	54.90	27.00	27.00	34.74	36.08
September	46.00	46.00	54.55	57.55	27.00	27.00	34.24	35.77
October	46.00	46.00	55.51	57.87	27.00	27.00	38.25	39.75
November	47.00	47.00	60.67	66.52	29.00	29.00	41.30	44.50
December	49.00	49.00	64.23	66.45	33.00	33.00	41.72	42.60
January	50.00	50.00	64.35	65.75	33.00	33.00	43.51	43.73
February	50.00	50.00	62.99	65.23	33.00	33.00	42.85	43.40
March	53.00	53.00	55.02	55.96	34.00	34.00	41.97	42.08

* Landed prices (Source: M/s Shah Trading Co., Mumbai)

** Sale prices which include duty (Source: Varanasi Market)

● **Silk Exports and Imports**

A. Exports

The export of 597.86 million US\$ (₹ 2723.86 crore) has been achieved during the year 2010-11 as compared to 2009-10 which was 609.58 Million US\$ (₹ 2892.44 crore). The provisional data about the status of silk goods export earnings during the year 2010-11 compared to 2009-10 as per the source data (DGCIS, Kolkata) is given below:

EXPORT EARNINGS OF SILK ITEMS						
(Value: Crore ₹/Mn.US \$)						
Itemwise Export	APRIL TO MARCH				% Increase / Decrease	
	2010-11 (P)		2009-10		₹	US \$
	₹	US \$	₹	US \$		
Natural Silk Yarn, Fabrics, Madeup	1578.40	346.45	1971.98	415.59	-19.96	-16.64
Readymade Garments	1095.10	240.36	854.95	180.18	28.09	33.40
Silk Carpet	15.84	3.48	40.59	8.55	-60.98	-59.36
Silkwaste	34.52	7.58	24.92	5.25	38.52	44.27
TOTAL	2723.86	597.86	2892.44	609.58	-5.83	-1.92

From the above table, it is seen that in the year 2010-11 Silk goods Exports showed a decrease of 5.83% (₹2723.86 crore) when compared to the Exports of ₹2892.44 crore during the year 2009-10 (Graph- 5a).

B. Imports

The import of raw silk into the country during the year 2010-11, was 5870 MT compared to imports of 7338 MT during 2009-10, indicating a decrease of 20.0% (i.e.,1468 MT).

It is observed that 5591 MT (95.25%) of raw silk, out of 5870 MT imported during the year 2010-11, was imported from China P Republic only (Graph-5b). The country-wise raw silk imported is given below:

IMPORT OF RAW SILK INTO THE COUNTRY						
(Value: Crore Rs.₹/Mn.US \$)						
Country	2010-11 (P)			2009-10		
	Qty.	VALUE		Qty.	VALUE	
	(MT)	₹	US \$	(MT)	₹	US \$
China P.Rep	5591	907.86	199.27	7097	913.07	192.43
Uzbekistan	126	9.65	2.12	82	5.90	1.24
Vietnam Soc Rep	31	2.94	0.65	16	1.35	0.28
Malaysia	25	3.09	0.68	4	0.21	0.04
Thailand	19	2.93	0.64	-	-	-
Others	78	11.97	2.62	139	13.17	2.79
Total	5870	938.44	205.98	7338	933.70	196.78

Source: DGCI&S, Kolkata. P: Provisional data

PRODUCTION STATISTICS FOR THE YEAR 2010-11

Annexure - a

STATE-WISE MULBERRY RAW SILK PRODUCTION						
Unit: Metric Tonnes						
State	2009-10			2010-11		
	Bivoltine	CB	Total	Bivoltine	CB	Total
A. Traditional States						
Karnataka	335	7025	7360	311	7027	7336
Andhra Pradesh	105	5014	5119	170	4991	5161
Tamil Nadu	351	882	1233	414	768	1182
West Bengal	1	1864	1865	3	1882	1885
Jammu & Kashmir	110	-	110	120	-	120
Sub-total(A)	902	14785	15687	1018	14668	15686
B. Non-Traditional States						
Assam	16	-	16	18	-	18
Arunachal Pradesh	3	-	3	3	-	3
Bihar	-	16	16	-	18	18
Chhattisgarh	2	7.7	9.7	0.30	5.70	6
Haryana	-	-	-	0.20	-	0.2
Himachal Pradesh	20	-	20	22	-	22
Jharkhand	-	3	3	-	2	2
Kerala	22	-	22	26	-	26
Madhya Pradesh	39	56	95	34	70	104
Maharashtra	56	162	218	101	111	212
Manipur	77	24.5	101.5	72	25	97
Mizoram	7	9.5	16.5	26	-	26
Meghalaya	5.2	-	5.2	9	-	9
Nagaland	3.5	-	3.5	3	-	3
Orissa	3	5.8	8.8	3	1	4
Punjab	5.3	-	5.3	5	-	5
Rajasthan	-	1.55	1.55	-	2	2
Sikkim	3	-	3	3	-	3
Tripura	-	12.5	12.5	-	8	8
Uttarakhand	14	-	14	20	-	20
Uttar Pradesh	22	38.45	60.45	36.50	49.30	86
Sub-Total(B)	298	377	635	382	292	674
Grand-Total (A+B)	1200	15122	16322	1400	14960	16360
Source : as reported by DOSs of States						
Note: Total may not tally due to rounding off of the figures.						

PRODUCTION STATISTICS FOR THE YEAR 2010-11

Annexure - b

STATE-WISE VANYA RAW SILK PRODUCTION			
Unit:Metric Tonnes			
Sl. No.	States	2009-10	2010-11(P)
Tropical Tasar (A)			
1	Andhra Pradesh	10.00	4.00
2	Bihar	27.00	30.00
3	Chhattisgarh	161.00	168.00
4	Jharkhand	404.00	766.00
5	Madhya Pradesh	74.00	58.00
6	Maharashtra	8.00	9.00
7	Orissa	71.00	78.00
8	Uttar Pradesh	6.00	9.00
9	West Bengal	37.00	41.00
	Total	798	1163
Oak Tasar (B)			
1	Arunachal Pradesh	0.10	0.10
2	Manipur	3.50	2.00
3	Mizoram	0.20	0.40
4	Nagaland	0.50	0.30
5	Jammu & Kashmir	0.50	0.10
6	Uttarakhand	0.50	0.10
	Total	5	3.00
	Total (A+B)	803	1166
Eri			
1	Andhra Pradesh	8.00	5.00
2	Arunachal Pradesh	15.00	16.00
3	Assam	1410.00	1714.00
4	Bihar	2.50	5.00
5	Chhattisgarh	2.00	3.00
6	Jharkhand	0.50	0
7	Madhya Pradesh	4.00	4.50
8	Manipur	280.00	222.00
9	Meghalaya	450.00	480.00
10	Mizoram	6.00	6.50
11	Nagaland	250.00	280.00
12	Orissa	9.00	5.00
	Contd.....		

PRODUCTION STATISTICS FOR THE YEAR 2010-11

STATE-WISE VANYA RAW SILK PRODUCTION			
Unit:Metric Tonnes			
Sl. No.	States	2009-10	2010-11(P)
	E ri		
13	Punjab	-	0.50
14	Sikkim	2.00	1.00
15	Uttar Pradesh	6.00	8.00
16	Uttarakhand	2.00	0.50
17	West Bengal	13.00	9.00
	Total	2460	2760
	Muga		
1	Arunachal Pradesh	0.50	1.20
2	Assam	93.00	117.00
3	Manipur	0.50	0.50
4	Meghalaya	10.00	3.25
5	Mizoram	0.30	0.40
6	Nagaland	0.50	1.40
7	West Bengal	0.20	0.25
	Total	105	124
	Grand Vanya Total	3368	4050
Source: as reported by DOSs of States.			

Fig-1a: Mulberry Plantation in the Country

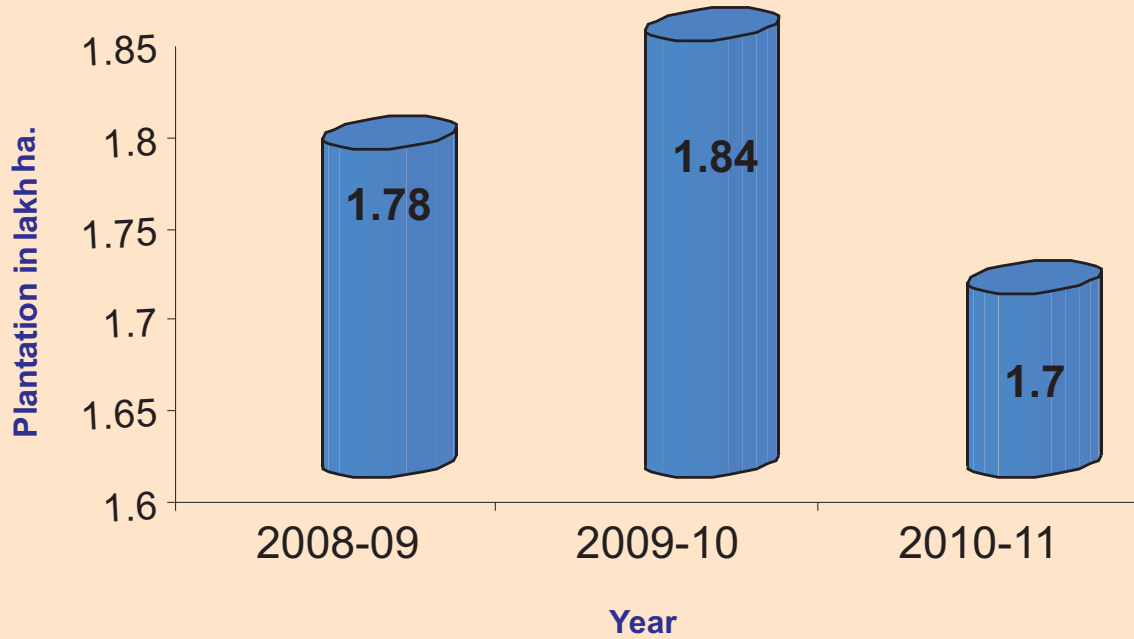


Fig-1b: Production of Mulberry Raw Silk

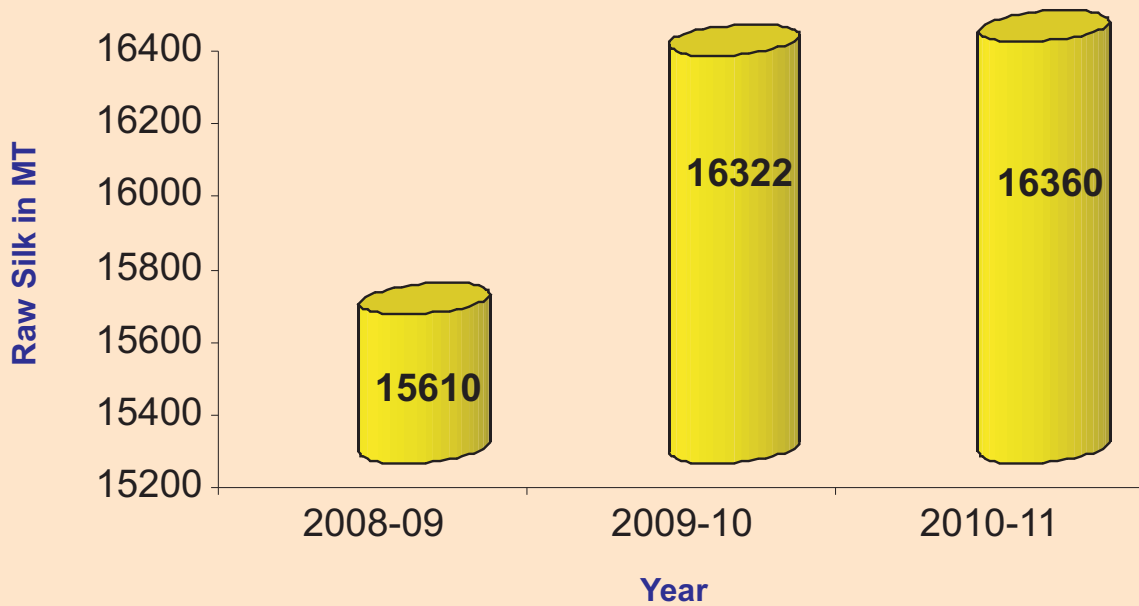


Fig-1c: Production of Bivoltine Raw Silk

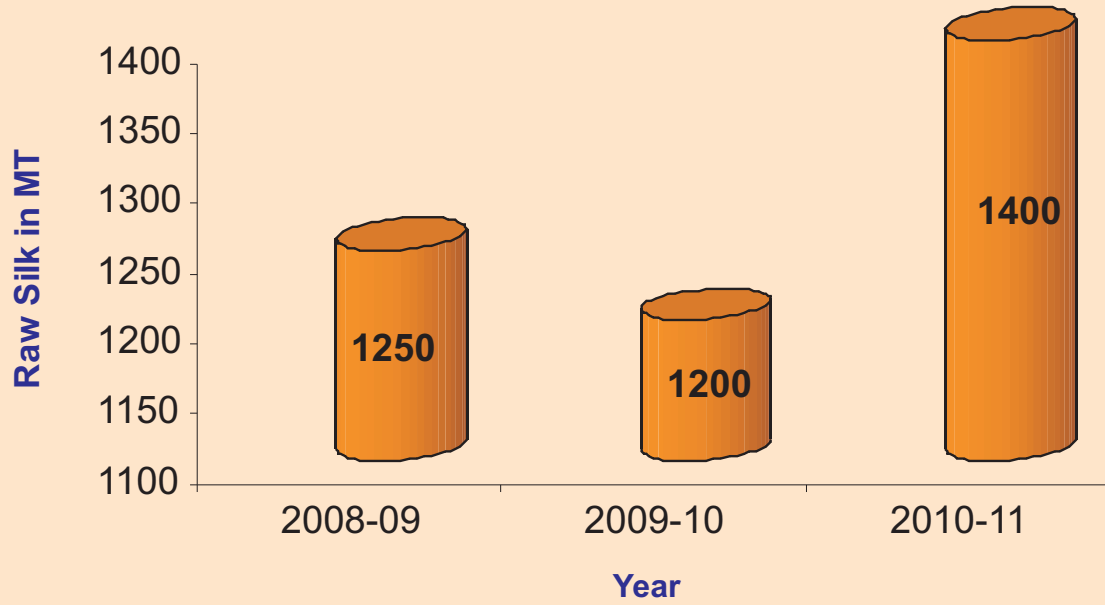


Fig-1d: Productivity of Mulberry Reeling Cocoon (kg/ha)

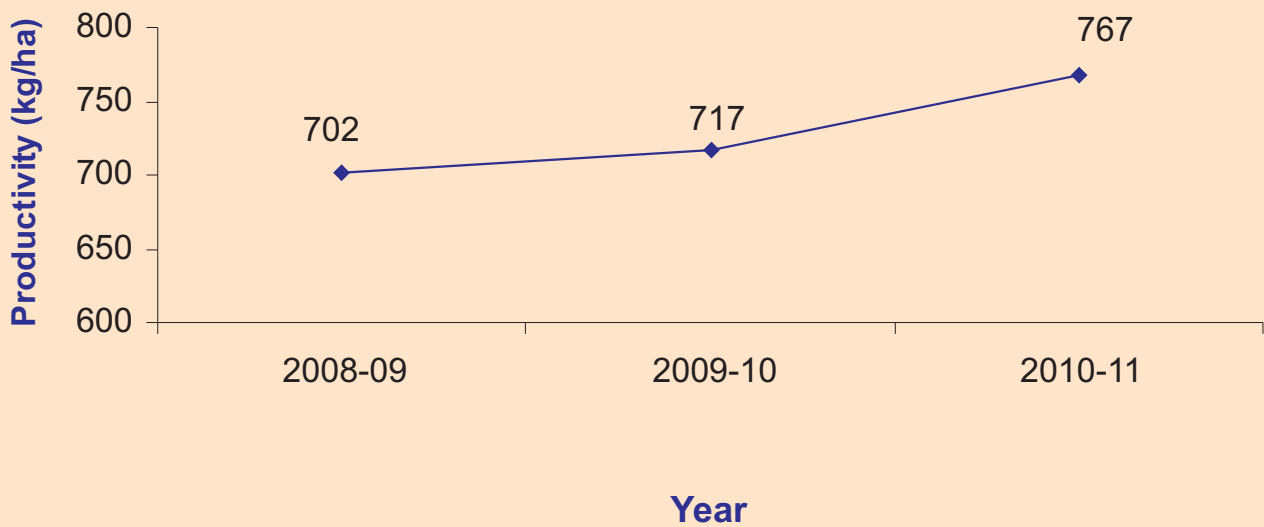


Fig-1e: Productivity of Mulberry Raw Silk (kg/ha)

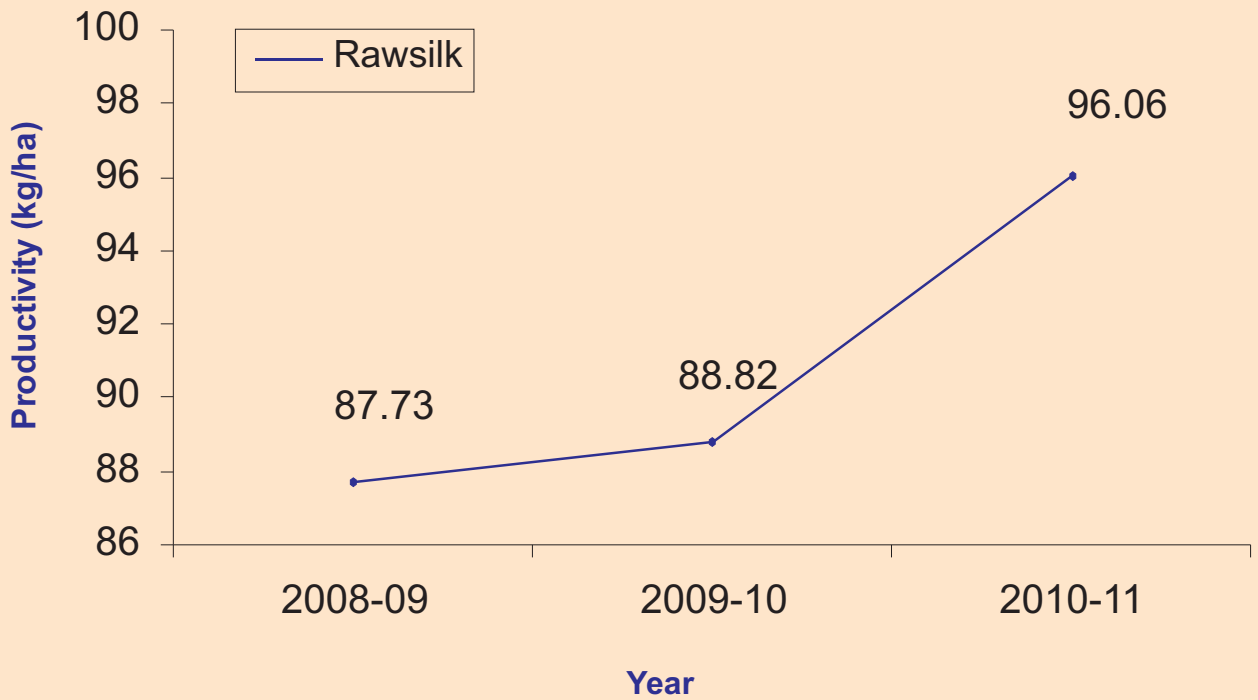


Fig-2a: Production of Tasar Raw Silk

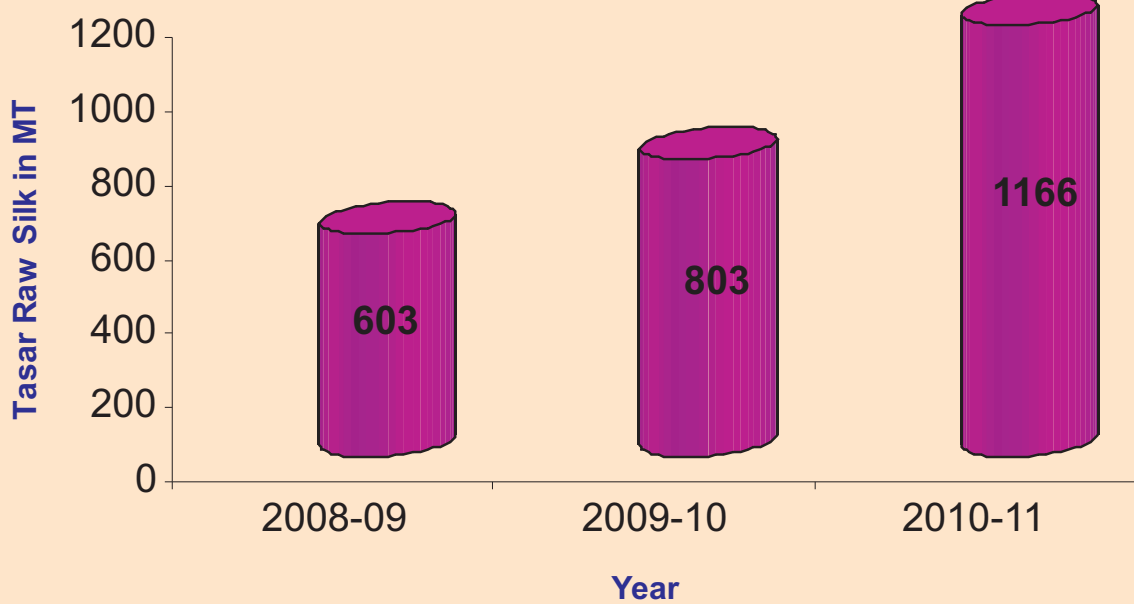


Fig-2b: Production of Eri Spun Silk

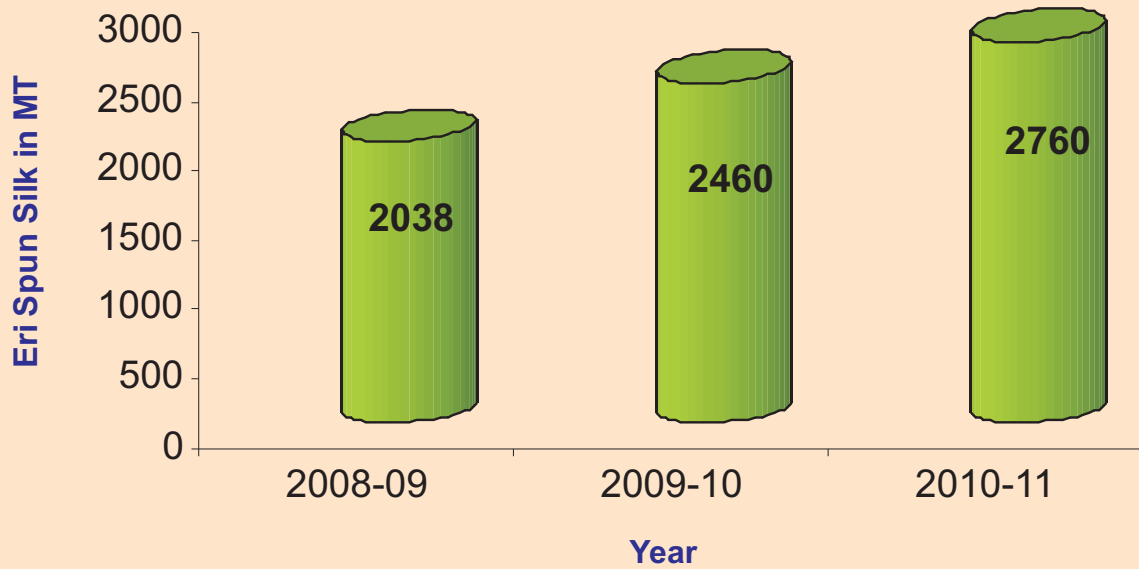


Fig-2c: Production of Muga Raw Silk

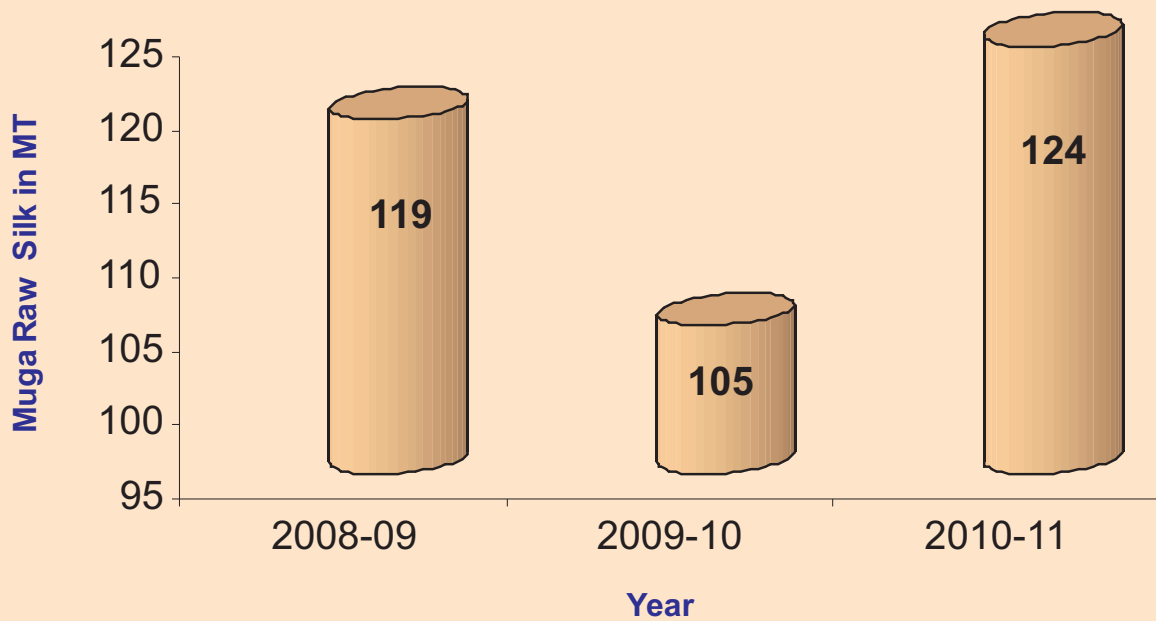


Fig-3a: Quantum transaction at Major Markets of Bivoltine hybrid Cocoons in Karnataka

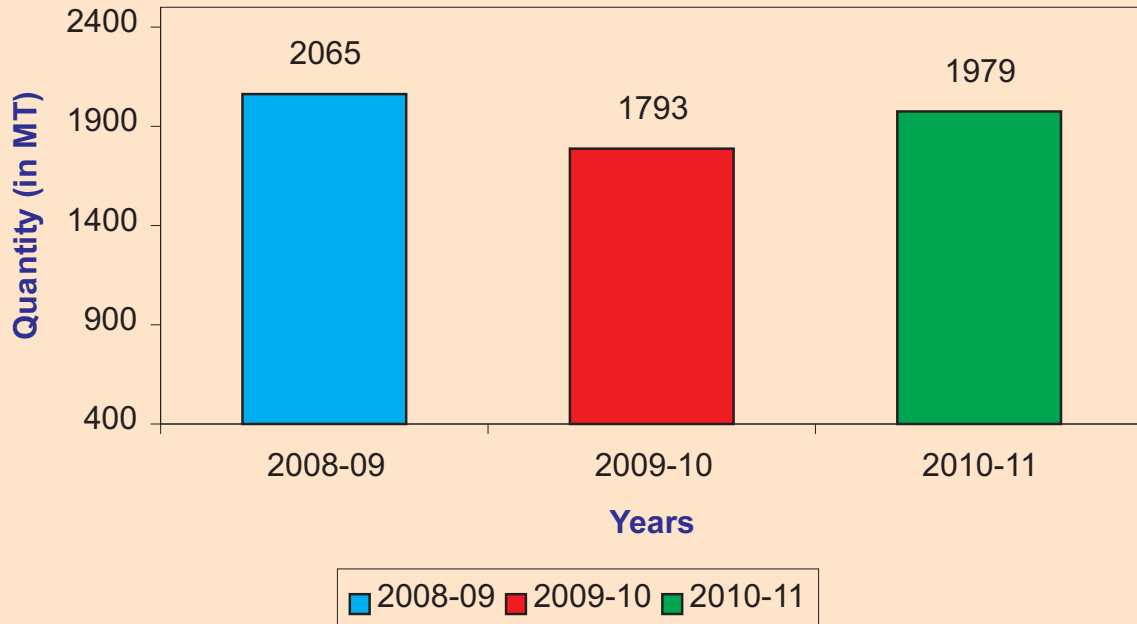


Fig-3b: Quantum transaction at major markets of Crossbreed Cocoons in Karnataka

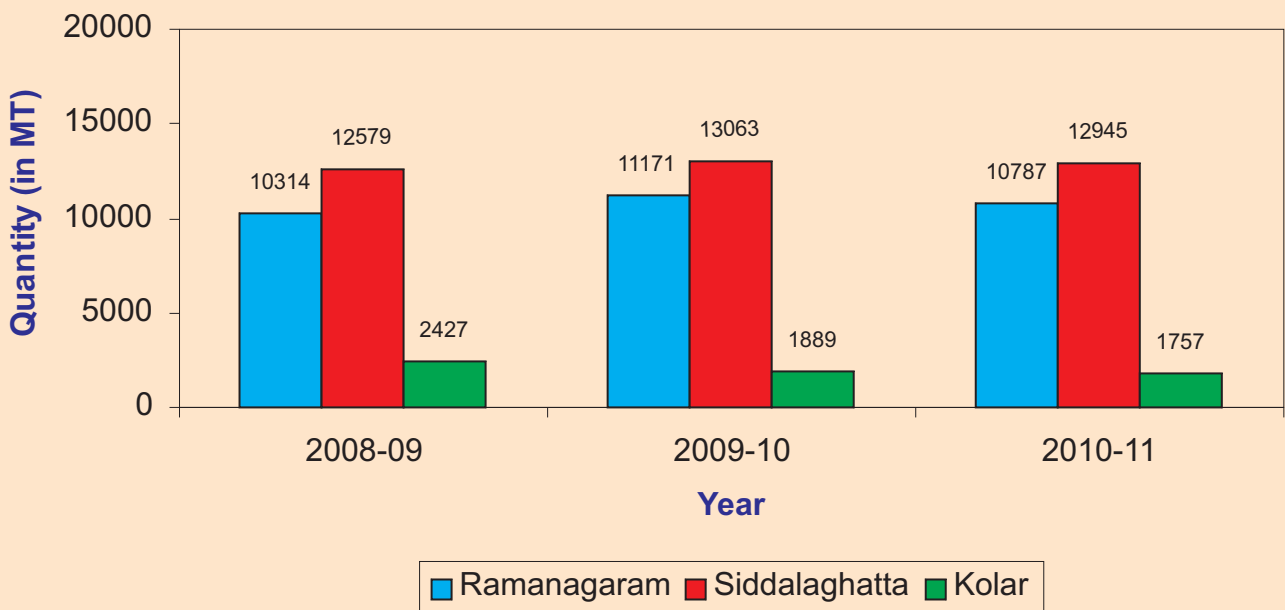


Fig-4a: Average Prices of Bivoltine (CSR) Cocoons at Ramanagaram Market

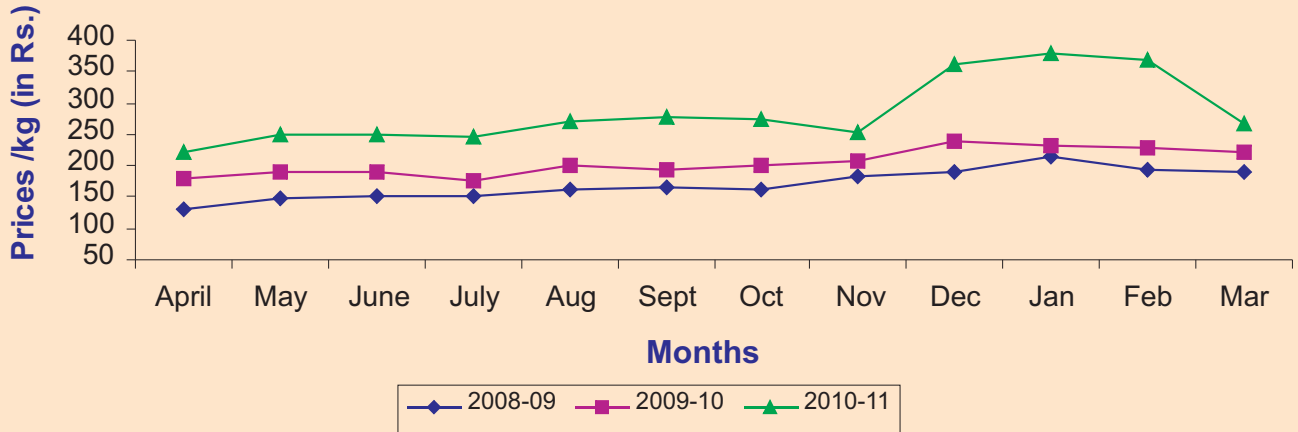


Fig-4b: Average Prices of Improved Cross Breed Cocoons at Ramanagaram Market

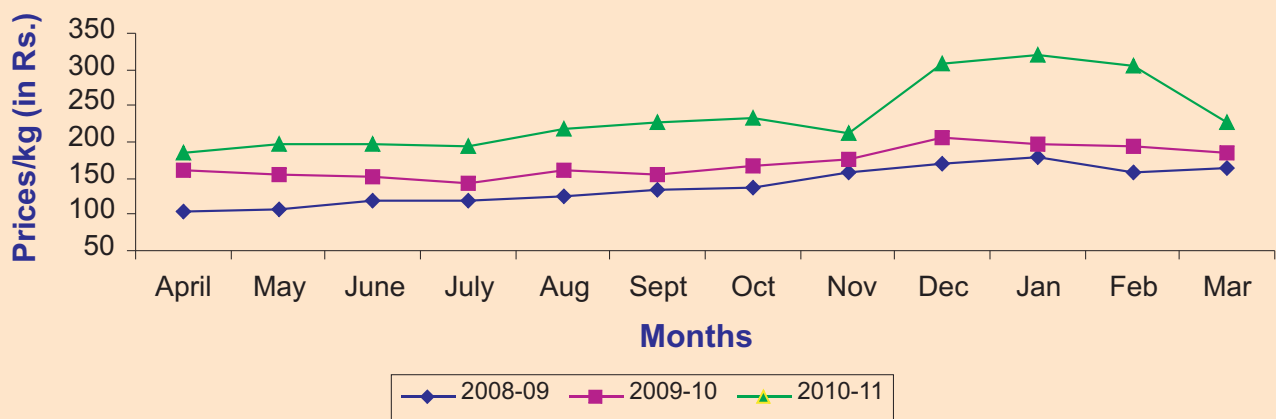


Fig-4c: Average Prices of Improved Cross Breed Cocoons at Sidlaghatta Market

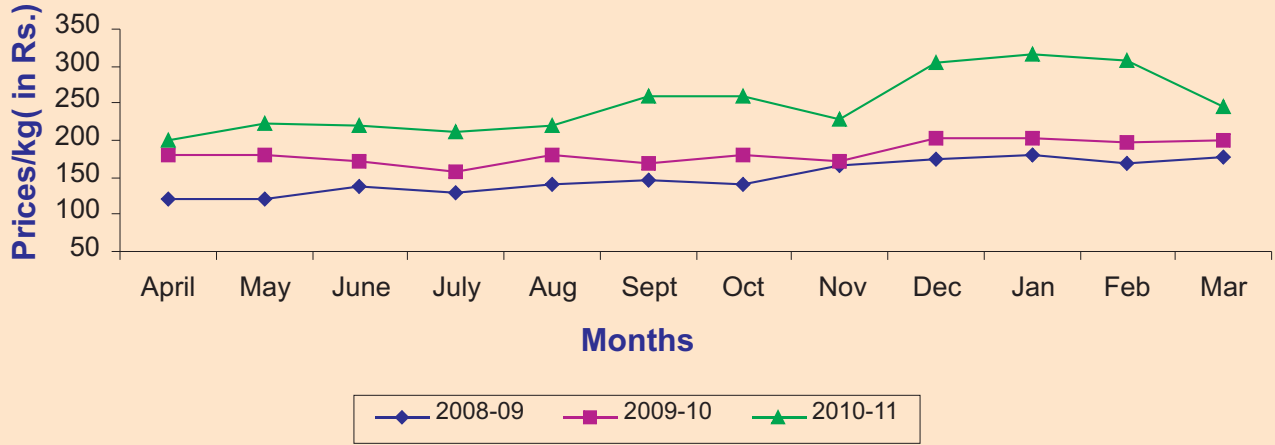


Fig-5a: Export Earnings of Silk Items

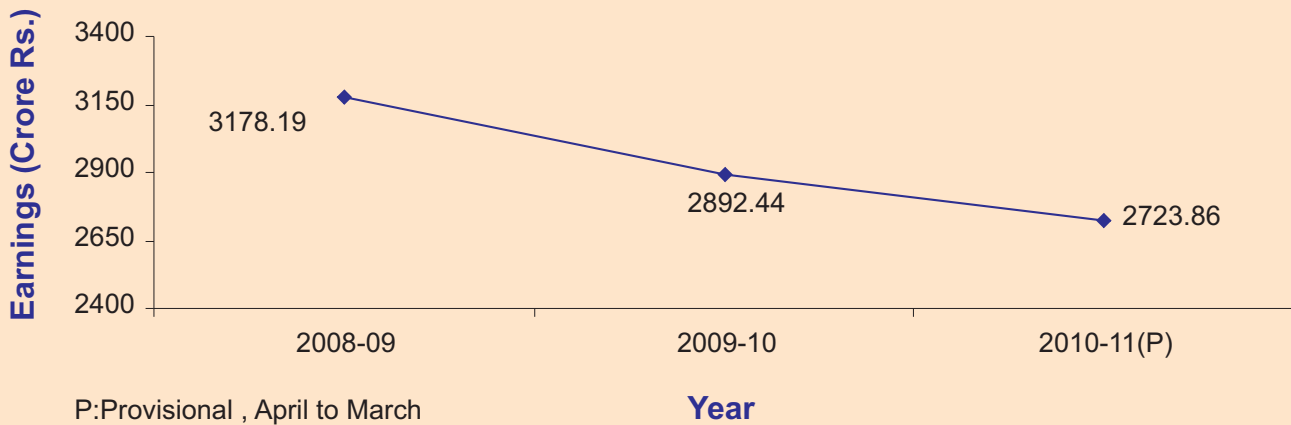
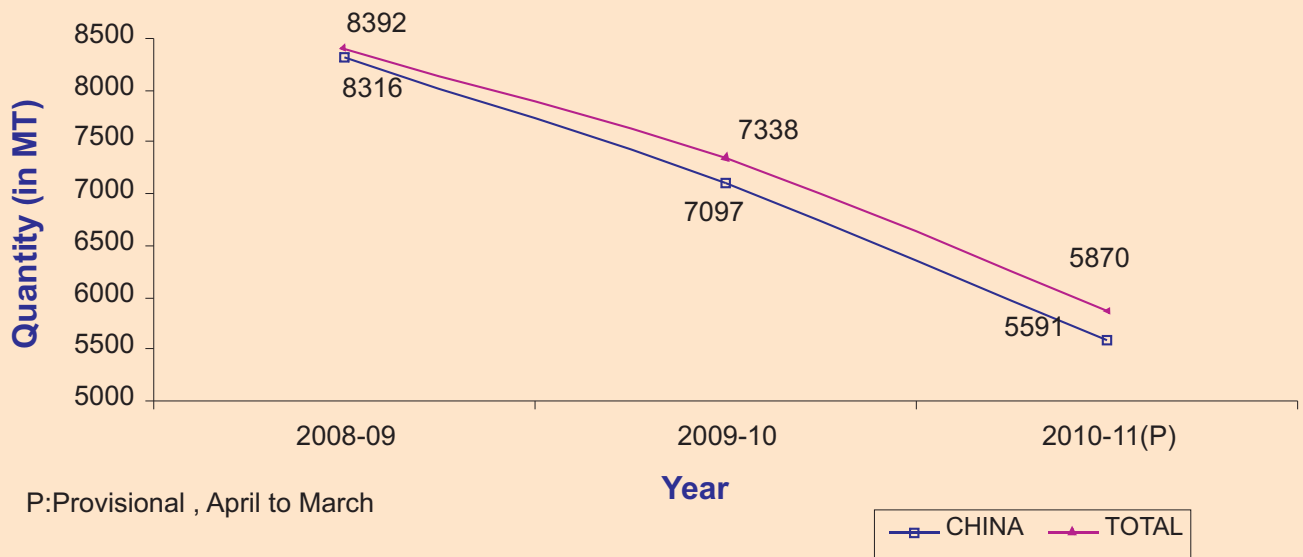


Fig-5b: Raw Silk Imports



**CENTRAL SILK BOARD
BANGALORE – 560 068**

COMPOSITION OF BOARD MEMBERS AS ON 31.03.2011

- I UNDER SECTION 4(3)(a)**
- Chairman – Vacant
- II UNDER SECTION 4(3)(b)**
- 2. Ms. Monika S. Garg,**
Joint Secretary (Silk), & Vice-Chairman,
CSB, Ministry of Textiles, Govt.of India,
“Udyog Bhavan”, NEW DELHI – 110 011.
- 3. Ms. M. Sathiyavathy, IAS**
Member Secretary
Central Silk Board, BTM Layout, Madiwala,
Bangalore – 560 068.
4. Vacant
- III UNDER SECTION 4(3)(c)**
- 5. Shri N. S. V. Chitthan, M.P.**
(Lok Sabha)
34, Indira Gandhi Street, Jawahar Nagar,
Thirumangalam – 625 706, Madurai District
(Tamil Nadu)
Shri N. S. V. Chitthan, M.P.
(Lok Sabha)
C-1/10, Tilak Lane, New Delhi – 110 011.
- 6. Shri R. Dhruvanarayana, M.P.**
(Lok Sabha)
211, 3rd Stage, 9th Cross, Gokulam,
Mysore – 570 002, Karnataka.
Shri R. Dhruvanarayana, M.P.
(Lok Sabha)
Room No.220, 2nd Floor, District Office Complex,
Chamarajanagar – 571 313, Karnataka
- 7. Shri P. C. Mohan, M.P.**
(Lok Sabha)
657, 11th Cross, 7th Block,
Jayanagar, Bangalore – 560 082.
Shri P. C. Mohan, M.P.
(Lok Sabha)
Bangalore Central Constituency
3rd Floor, Podium Block,
Dr. Vishveshwaraiah Centre
Dr. B.R. Ambedkar Veedhi
BANGALORE 560 001.
- 8. Shri E. G. Sugavanam, M.P.**
(Lok Sabha),
173/128-B, Krishnagiri Main Road,
Barugur – 635 104, Krishnagiri District (T.N).
Shri E. G. Sugavanam, M.P.
(Lok Sabha),
119, South Avenue,
New Delhi – 110 001.
- 9. Shri K. B. Shanappa, M.P.**
(Rajya Sabha)
No. 804, Brahmaputra, B.D. Marg,
New Delhi – 110 001.
Shri K. B. Shanappa, M.P.
(Rajya Sabha)
“Gudi Smruthi” No.105/9,
Opp.N.V.School, Brahmampur,
Gulbarga – 585 103.
- 10. Shri Dhiraj Prasad Sahu, M.P.**
(Rajya Sabha),
190, South Avenue, New Delhi 110 011.
Shri Dhiraj Prasad Sahu, M.P.
(Rajya Sabha)
Thana Road, P.O.Dist. Lohardaga,
Jharkhand – 835 302.
- IV. UNDER SECTION 4(3)(d)**
- 11. Shri B. S. Ramprasad, IAS**
Secretary to Government,
[Mines, SSI & Textiles]
Commerce and Industries Dept.,
Government of Karnataka,
No.135, 1st Floor, Dr. Ambedkar Veedi,
Vidhana Soudha, Bangalore – 560 001.
- 12. Dr. N. Nagambika, IAS**
Commissioner for Sericulture
Development and Director of Sericulture,
Govt. of Karnataka, Dr.Ambedkar Veedi,
MS Building, Bangalore – 560 001.
- 13. Shri K. M. Somashekar**
S/o (Late) Subbanna (Marappa),
Kadajetti Grama, Hosakadajetti Post,
Nanjangud Taluk, Mysore District, Karnataka.

14. Shri T. N. Narasimhaiah,
S/o. Narasappa,
Ex-President, Taluk Panchayat,
Talemarada Halli, Ponnasamudra Post – 561 202,
Pavagada Taluk, Tumkur District, Karnataka.

15. Shri Chinnapara Narayana Swamy Bin Ramaiah
Cinnapara Grama, Kamadena Halli,
Kolar District, Karnataka

V. UNDER SECTION 4(3)(e)

16. Vacant

VI. UNDER SECTION 4(3)(f)

17. Shri H. Mohan, IAS
Commissioner of Textiles,
Government of West Bengal, 6th Floor,
Block-A, New Secretariat Building,
1 K.S. Roy Road, Kolkata – 700 001.

18. Shri Basudev Acharya, M.P.
(Lok Sabha),
21, Ashoka Road, New Delhi.

Shri Basudev Acharya, M.P.
(Lok Sabha),
Village Kantaranguni, P.O. Adra,
Distt. Purulia - 723 101, West Bengal.

V. UNDER SECTION 4(3)(g)

19. Shri S. K. Sinha, IAS
Commissioner of Sericulture,
Government of Andhra Pradesh,
Road No.72, Prasasan Nagar,
Adjacent to Water Tank,
Jubilee Hills,
Hyderabad – 500 033.

20. Shri Bhaskar Mushahary, IAS
Principal Secretary to Government of Assam,
Handloom, Textile & Sericulture Dept.,
Assam Secretariat, Block-C, 2nd Floor, Dispur,
Gauwahati – 781 006 (Assam)

21-23 Vacant

24. Shri Dharendra Kumar,
Special Secretary – cum - Director,
Handlooms, Sericulture & Handicrafts,
Department of Industries, Govt. of Jharkhand,
Nepal House Secretariat, 3rd Floor, Doranda,
Ranchi – 834 002.

25. Shri S. D. Pateriya, IFS
Director of Sericulture,
Government of Madhya Pradesh
Lower Basement, Satpura Bhawan,
Bhopal – 462 004.

26. Shri Arun Singh,
Director of Sericulture,
Directorate of Sericulture-UP
Government of Uttar Pradesh,
LDA Commercial Complex,
Vishwas Khand-3, Gomti Nagar,
Lucknow.

27. Vacant

VI. UNDER SECTION 4(3)(h)

28. Shri Iqbal Khandey,
Principal Secretary to Govt.,
Agriculture Production Department,
Government of Jammu & Kashmir,
Civil Secretariat, Jammu – 180 001(J & K).

VII. UNDER SECTION 4(3)(i)

29. Smt. Arti Ahuja, IAS
Commissioner-cum-Secretary,
Textiles & Handloom Department,
Government of Odisha, Bhubaneswar.

30. Dr. (Miss) A. Khonglam
Director of Sericulture & Weaving,
Government of Meghalaya, Shillong.

31. Vacant

VII. UNDER SECTION 4(3)(j)

32. Shri M. Manoharan
4/32 Dr.Ambedkar Street,
Palavakkam,
Chennai-41.

33. Shri A. Manivelan,
No.30, Thiyagaraya Pillai Street,
Seven Wells,
Chennai-600001.

34. Shri G. Eagappan,
No.105, Chinnathambi Street,
Kosapet, Perumalpettai,
Chennai-600 013.

35. Shri T. V. Sathesh Kumar,
No.19, G-2, Chetty Street,
Ayanavaram, Chennai-600 023.

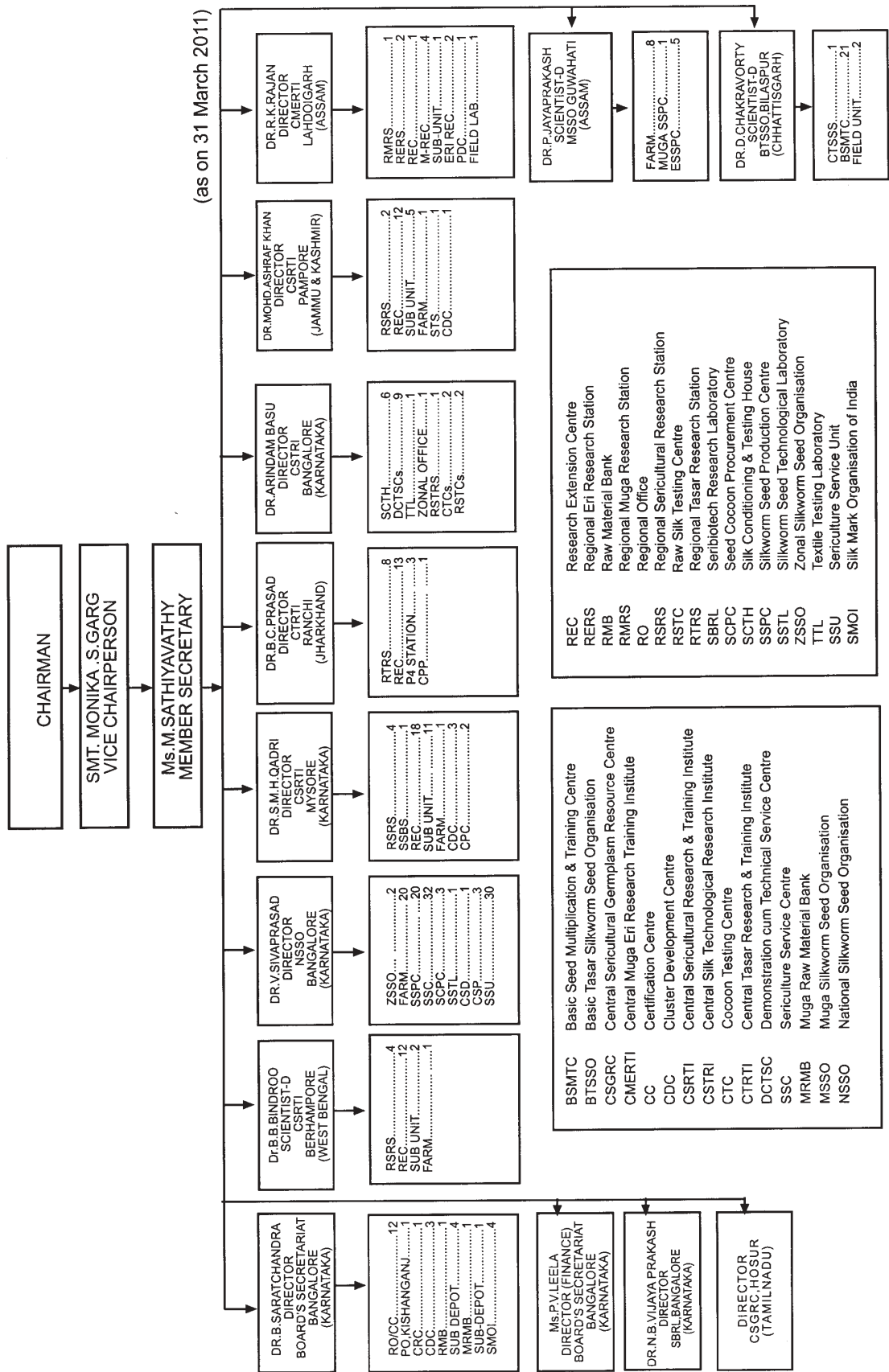
- 36. Shri Ma. Pa. Anbudurai,**
Old No.42, New No.5, M.A.Garden,
Pillayar Koil Street,
Teynampet, Chennai-600 018.
- 37. Shri A. R. P. M. Kamaraj,**
No. 28, Kajadi Begam Street,
Royapet, Chennai-600 014.
- 38. Shri S. Madan Mohan,**
No.4, 34/3, Krishnappa Chetty Street,
Chintharipet,
Chennai-600 014.
- 39. Shri N. Ramalingam,**
No. 27, A-Block, MMDA Colony,
Arumbakkam,
Chennai- 600106.

PERMANENT INVITEES

- 1. The Textile Commissioner,**
Ministry of Textile, Govt. of India
New CGO Building,
48, New Marine Line,
P.B. No. 11500.
MUMBAI - 400 020.
- 2. The Chairman,**
Indian Silk Export Promotion Council
62, Mittal Chambers ,
Nariman Point,
MUMBAI - 400 021.

Annexure - II

ORGANISATION CHART OF CENTRAL SILK BOARD



**CENTRALLY SPONSORED SCHEMES FOR SERICULTURE DEVELOPMENT DURING XI PLAN
(INTEGRATED CATALYTIC DEVELOPMENT PROGRAMME)**

PHYSICAL & FINANCIAL OUTLAY FOR XI PLAN (2007-12) AND PHYSICAL & FINANCIAL ACHIEVEMENT DURING 2007-08, 2008-09, 2009-10 and 2010-11 UNDER CDP
(Rs.in crores and physical units as indicated)

Sl. No.	Name of the Scheme / Component	Outlay for XI Plan (2007-12)		2007-08		2008-09		2009-10		2010-11	
				Achievement		Achievement		Achievement		Achievement	
		Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial
1	Package for Seed Sector										
a)	Mulberry										
1	Support for upgrading existing Seed / Grainage Units under Mulberry Sector (Units)	10	0.66	4	0.25	11	0.63	24	0.68	38	1.68
2	Support to establish large scale Bivoltine Seed production Grainages in Public/Pvt. Sector(Nos.)	10	6.40							1	0.60
3	Assistance for Seed Testing Facilities in Public/ Pvt. Grainages (for Quality seed production)(Nos.)	250	2.40	5	0.07	17	0.15	40	0.35	104	0.94
4	Assistance for mulberry silkworm seed production units (Support to get ISO / BIS Quality Seed Certification for Silkworm Seed Units)										
a)	P1 Grainages (Nos.)	3	1.80	1	0.02	—	—	1	0.11	2	0.39
b)	P2 Grainages (Nos.)	1	0.30	—	—	1	0.06	1	0.05	1	0.36
	Total for Mulberry		11.56		0.34		0.84		1.19		3.97
b)	Vanya										
i)	Tasar										
5	Assistance to Private Tasar Graineurs (Nos.)	1270	9.15	46	0.36	281	1.22	704	3.82	1378	9.29
6	Assistance to strengthening of tasar seed multiplication infrastructure (No of PPCs) infrastructure (No. of PPCs)	20	0.37	7	0.14	23	0.44	11	0.21	53	0.72
7	Assistance for strengthening of Seed Multiplication / Infrastructure for Oak Tasar in the State (Nos)	31	1.85	2	0.12	3	0.18	18	0.45	3	0.07
8	Assistance to seed rearers (Nos.)	1500	0.81	451	0.23	732	0.34	2074	1.03	4872	2.56
	Total for Tasar		12.18		0.85		2.18		5.51		12.64
ii)	Eri										
9	Assistance to State Depts., for Strengthening of existing Eri farm cum Grainages including assistance to Seed Rearer cum Private Graineurs (Nos.)	50	2.01	16	0.62	6	0.21	11	0.42	16	0.66
	Total for Eri		2.01		0.62		0.21		0.42		0.66
iii)	Muga										
10	Assistance to Muga Private Graineurs (Nos.)	930	8.08	90	0.78	60	0.51	276	2.32	597	5.22
11	Assistance to State Departments for Strengthening of Muga seed multiplication infrastructure (Nos.)	34	4.60	4	0.51	—	—	7	1.00	27	3.51
	Total for Muga		12.68		1.29		0.51		3.32		8.73
	Total for Vanya		26.87		2.76		2.90		9.25		22.03
	Total for Seed Packages		38.43		3.10		3.74		10.44		26.00
2	Package for Cocoon Sector										
a)	Mulberry										
1	Support for Mulberry Plantation Development: (Raising of high yielding Mulberry varieties in private lands / raising and maintenance of tree plantations / maintenance of existing mulberry trees / replacement of old mulberry varieties with new varieties)(in acres)	65,000	20.03	10757.40	2.52	14524	4.62	19980	6.07	30523.97	9.05
2	Assistance for irrigation and other Water Conservation and usage techniques : (To cover all types of irrigation such as drip, tube / open wells, shallow wells, ponds, farm ponds, surface tanks and similar water harvesting systems including ground level water storage tanks and soil moisture methods) and storage / conservation facilities (for different types of structure for different serizones) (Hectares)	12,000	33.00	3210	8.31	4541	10.51	4247	10.67	7764	17.00
3	Supply of Rearing Appliances (including improved moutages / farm equipments to farmers) - for Bivoltine Sericulture Farmers (acres)	15,000	36.00	5438	10.74	7272	10.96	11216	17.82	24692	43.49

Sl. No.	Name of the Scheme / Component	Outlay for XI Plan (2007-12)		2007-08		2008-09		2009-10		2010-11	
				Achievement		Achievement		Achievement		Achievement	
		Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial
4	Supply of quality Disinfecting Materials and other crop protection measures for Bivoltine seed farmers(Nos.)	50,000	5.40	3895	0.32	1325	0.15	6938	0.82	14079	1.18
5	Assistance for Construction of Rearing Houses (RHs) - Models of Rs.1,50,000/-, Rs.1,00,000 & Rs.50,000	14984 31400 64697	75.99 91.70 125.09	8742	22.12	7760	22.03	11006	33.09	6642 2801 10023	63.96
6	Assistance for maintenance of Chawkie gardens, construction of Chawkie Rearing Centre (CRC) buildings and procurement of Chawkie Rearing equipments:(Units)	600	8.02	48	0.65	107	1.52	66	0.92	77	1.02
7	Insurance Support (For all Sectors) (lakh DFLs)	Demand Dependant	4.00	0.15	0.0023	1.10	0.10	1.28851 lakh dfls + 750 nucleus farmers	0.09	13.69	1.49
8	Setting up of Production units for Biological in puts (Inoculants, Biological control agents etc.)	100	1.00	—	0.00	6	0.05	11	0.10	3	0.03
9	Door to Door Service Agents for Disinfection and inputs supply & Assistance for Sericulture Poly-Clinics.	100 poly clinics	1.50	—	0.00	7	0.05	39	0.33	57	0.48
10	Assistance for Farmers Training (Nos.)	178	1.00	500 Farmers	0.03	1 School	0.01	8	0.05	7	0.04
Total for Mulberry			402.73		44.69		50.00		69.96		137.74
b) Vanya											
i) Tasar											
11	Support to rearers for Augmentation of tasar host plantation (Hectares)	10,000	11.52	1210	1.55	2295	2.54	3769	3.97	10220	9.14
12	Assistance for raising and maintenance of systematic plantation of Oak Tasar(Hectares)	1500	1.92	50	0.05	52	0.07	66	0.05	105	0.17
13	Assistance for Construction of Cocoon Storage Houses in Tasar Sector (Nos)	400	1.00	34	0.08	68	0.13	304	0.51	584	1.46
Total for Tasar			14.44		1.68		2.74		4.53		10.77
ii) Eri											
14	Support for Castor/Tapioca cultivators with Start-up tools (Half acre units)	125000	9.45	1946	0.13	1860	0.13	2370	0.25	6030	0.42
15	Augmentation of perennial Eri food plants with supply of Start-up tools (acres)	11,850	9.48	2222	1.75	1268	0.94	2179	1.59	3665	2.90
16	Construction of Rearing houses (Nos.)	2081	7.50	3801	14.11	2069	6.83	3982	14.08	6502	23.93
Total for Eri			26.43		15.99		7.90		15.92		27.25
iii) Muga											
17	Raising of nursery of Muga food plants/Augmentation of Muga plantations with supply of farming tools / assistance to Muga silkworm rearers & seed rearers (acres)	10,000	13.12	1970	2.49	853	1.04	2395	2.82	3062	3.82
Total for Muga			13.12		2.49		1.04		2.82		3.82
Total for Vanya			53.99		20.16		11.68		23.27		41.84
Total for Cocoon Packages			456.72		64.85		61.68		93.23		179.58
3 Package for Post-Cocoon Sector											
i) Silk Reeling & Spinning Components											
1	Popularization of New Slow-Speed, (Twenty-end per Basin) Certified Multi-end Reeling Machines (18 basins - equivalent to 360 ends) (No. of units)	10	2.00	—	—	—	—	—	—	—	—
2	Support for establishment of Certified Multi-end Reeling Machines: a) 10 Basins	300	15.75	21	1.04	51	2.27	27	1.43	81	4.26
	b) 20 Basins	100	8.50	—	—	2	0.17	3	0.24	10	0.85
3	Establishment of Automatic / Semi-automatic Reeling Units (Imported) (No.of Units)	10	5.00	—	—	3	1.50	2	1.00	—	—
4	Support for establishment of Improved Cottage Basin Reeling Units (No.of Units)	300	4.13	33	0.46	14	0.23	15	0.23	45	0.76
5	Support for existing Charkha Reeling Units to dissuade child labour (Motorized Charkhas) (No.of Units)	1000	0.53	—	—	85	0.04	388	0.19	260	0.13

Sl. No.	Name of the Scheme / Component	Outlay for XI Plan (2007-12)		2007-08		2008-09		2009-10		2010-11	
				Achievement		Achievement		Achievement		Achievement	
		Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial
6	Support for Setting up of Certified Dupion Silk Reeling Units (10 KG. / 20 KG. - Prorata basis) (No.of Units)	100	1.15	3	0.04	11	0.12	—	—		
7	Support for Hot Air Driers-Electrical/Multi-fuel / Ushnakotis for Reeling Units - 50 kg. & 100 kg. cap (No.of Units)	50	0.33	32	0.21	48	0.27	39	0.29	84	0.47
		20	0.20	1	0.01	8	0.09	68	0.76	56	0.67
8	Assistance for Twisting Units (400 Spindles)(Nos.)	100	4.56	14	0.63	38	1.68	66	2.49	85	3.81
9	Support for establishment of Pupae Oil Extraction Production and Bye - product utilisation Units (Nos.)	10	1.05	—	—	—	—	—	—	0	0.00
10	Incentive for production of Bivoltine Silk (MTs)	3000	22.50	285.43	1.52	195.26	1.05	285	1.77	579.8999	0.65
11	Quality linked price Support system for Cocoons and Raw Silk - for State Govts./Co-operatives/NGOs/SHGs (No.of States)	25	11.97	9	1.86	11	3.23	5	2.01	10	1.49
12	Establishment of Cocoon Banks / Market Support to Vanya Sector - RMBs for Tasar, Oak Tasar, Eri & Muga (Nos.)	10	8.25	3	0.45	3	0.49	7	2.66	2	0.90
13	Providing Services of Master Reelers/Weavers/ Dyers to reeling/weaving/dyeing Units - through / for State Governments/NGOs/Coop Soc./SHGs (Nos.)	100	0.75	4	0.03	28	0.20	28	0.19	42	0.31
14	Support for Vanya Reeling/Spinning Sector										
	a) Spinning (Nos.)	5000	1.41	1120	0.24	2008	0.55	1281	0.37	1233	0.30
	b) Reeling-cum-Twisting (Nos.)	1500	1.80	656	0.65	999	1.02	386	0.23	749	0.62
15	Support for establishment of Spun /Spinning Mills (Nos.)	3	3.06	1	1.36	—	—	1	1.11	0	0.00
	Total for Reeling & Spinning		92.94		8.50		12.91		14.97		15.22
ii)	Silk Weaving Components										
16	Support for establishing shuttle-less looms (each unit with 8 looms and 1 sectional warping machine) (Units)	20	5.00	2	0.50	11	4.75	15	3.82	13	3.25
17	Support for Handloom Sector for Loom Upgradation										
	1. Support for Certified Handlooms specially designed for [Parallel beat-up / Swing beat-up, Negative let off, 5 - Wheel take - up, Separate cloth ruler along with Jacquard (240 hooks)] (Nos.)	2000	3.22	172	0.39	742	1.04	1322	1.98	1546	2.57
	2. Loom Upgradation through Jacquards (or dobby / pneumatic lifting mechanism / Ball to beam conversion device etc.) (Nos.)	5000	3.10	332	0.19	652	0.42	1538	0.81	6956	3.67
	3. Computer Aided Textile Designing (CATD)(Nos.)	50	1.63	1	0.04	51	1.28	85	2.32	27	0.89
	Total for Weaving		12.95		1.12		7.49		8.93		10.38
iii)	Silk Wet Processing Components										
18	Support for setting up of Common Facility Centre for yarn dyeing / Fabric processing : (Nos.)										
	1. Yarn Dyeing : 25 Kg. capacity	100	2.29	1	0.02	34	0.72	18	0.57	32	0.79
	2. Yarn Dyeing : 50 Kg. capacity	50	1.90	—	—	5	0.19	10	0.41	1	0.10
	3. Arm Dyeing : 50 Kg. capacity	20	1.83	1	0.10	2	0.19	12	0.85	5	0.46
	4. Fabric Processing Facilities	4	0.78	4	0.63	3	0.49	9	1.42	3	0.59
	Total for Wet Processing		6.80		0.75		1.59		3.25		1.94
	Total for Post-Cocoon		112.69		10.37		21.99		27.15		27.54

Sl. No.	Name of the Scheme / Component	Outlay for XI Plan (2007-12)		2007-08		2008-09		2009-10		2010-11	
				Achievement		Achievement		Achievement		Achievement	
		Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial
4	Corporate Participation in Sericulture	5 Projects	35.78	—	—	—	—	—	—	0	0.00
5	Support Services Sector										
1	Product Design and Development - Generic Promotion of Indian Silks / Sericulture (Including Exhibitions, Buyer-Seller meets, etc., (No. of States)		0.50	—	—	2	0.11	2	0.12		0.08
2	Vanya Silk Market Promotion Cell (No. of States)		1.00	—	—	2	0.45	1	0.39		0.35
3	Entrepreneurship Development & Management Development Programmes. (No. of States)	100	1.00	2	0.26	10	0.17	7	0.21	9	0.44
4	Beneficiary Empowerment Programme conducted by States and Seri related exposure visits.(No. of Beneficiaries)	4340 Farmers	2.17	4206	1.75	876	0.35	8258	2.31	28832	13.75
5	Publicity for the sector (Audio visuals / Printing / Exhibitions / BSMs / Awareness programme, Workshops / Seminars, etc.) (No. of States)	Demand Dependant	4.00	2	0.38	18	0.41	16	0.56	27	1.36
6	Assistance towards Studies/Consultancies/Surveys/ Monitoring/Supervision/Evaluation etc. (No. of States)		3.00	—	—	—	—	—	0.27		0.14
7	Assistance to NGOs / SHGs & Agencies other than CSB & State for meeting administrative expenditure towards Project Implementation in the Vanya sector and in the Mulberry sector (No. of States)		2.00	—	0.03	—	0.08	3	0.20		0.23
8	Cluster Development Projects through NGOs/SHGs / Support for Special SGSY Projects / Scheme of Fund for Regeneration of Traditional Industries (SFURTI) etc.(No. of States)		1.00	20	0.0079	14	0.08	15	0.16	27	0.23
9	Women Development Components (No. of beneficiaries)		2.33	4	0.08	26040	1.67	234300	8.90	71 Creches / toilets + 148876	11.00
10	Emphasis on Tribal areas (No. of Beneficiaries)		1.00	—	0.00	8	0.01	83	0.12	275	0.19
	Total for Support Services		18.00		2.50		3.33		13.24		27.77
	Total for CDP		661.62		80.82		90.74		144.06		260.89

Note : New Components are indicated in Bold and Italics

ABBREVIATIONS

AICEM	All India Co-ordinated Experimental Trials for Mulberry
BSF	Basic Seed Farm
BSMTC	Basic Seed Multiplication & Training Centre
BTSSO	Basic Tasar Silkworm Seed Organization
CBR	Cost benefit ratio
CC	Certification Centre
CDC	Cluster Development Centre
CPC	Coocon Promotion Centre
CDP	Catalytic Development Programme
CTC	Cocoon Testing Centre
CISR	Centre for Integrated Sericulture Research
CMERTI	Central Muga Eri Research & Training Institute
CSD	Centre for Sericulture Development
CPP	Cluster Promotion Programme
CRC	Chawkie Rearing Centre
CSGRC	Central Sericultural Germplasm Resource Centre
CSRTI	Central Sericultural Research & Training Institute
CSTRI	Central Silk Technological Research Institute
CTR TI	Central Tasar Research & Training Institute
CTSS	Central Tasar Silkworm Seed Station
DCTSC	Demonstration cum Technical Service Centre
DFL	Disease Free Laying
DGAD	Director General of Anti-Dumping and Allied Duties
DOS	Department of Sericulture
ERR	Effective Rearing Rate
ESSPC	Eri Silkworm Seed Production Centre
GEC	Grainage Extension Centre
IIFS	Intensive Integrated Farming Management
IINM	Intensive Integrated Nutrient Management
IVLP	Institute Village Linked Programme
JBIC	Japanese Bank for International Co-operation
JICA	Japanese International Co-operation Agency
KSSRDI	Karnataka State Sericulture Research and Development Institute
MORD	Ministry of Rural Development
MRMB	Muga Raw Material Bank

MSSO	Muga Silkworm Seed Organization
MT	Metric Ton
MOT	Ministry of Textiles
NGO	Non Governmental Organization
NHDC	National Handloom Development Corporation
NSSO	National Silkworm Seed Organization
ORP	Operational Research Project
PTD	Participatory Technology Demonstration
R&D	Research and Development
REC	Research Extension Centre
RERS	Regional Eri Research Station
RMB	Raw Material Bank
RMRS	Regional Muga Research Station
RO	Regional Office
RSRS	Regional Sericultural Research Station
RSTRS	Regional Silk Technological Research Station
RTRS	Regional Tasar Research Station
RSTC	Raw Silk Testing Centre
SBRL	Seri-biotech Research Laboratory
SCPC	Seed Cocoon Procurement Centre
SCTH	Silk Conditioning & Testing House
SMOI	Silk Mark Organisation of India
SSPC	Silkworm Seed Production Centre
SSTL	Silkworm Seed Technological Laboratory
SSC	Sericulture Service Centre
SSU	Sericulture Service Unit
STS	Sericulture Training School
TAR	Technology Assessment and Refinement
TTL	Textile Testing Labs
ZSSPO	Zonal Silkworm Seed Project Office

