

Scheme 1: R&D, Training, Transfer of Technology & IT Initiatives:

Ongoing Schemes:

Following on going schemes will continue during the XII Plan

- Ongoing research activities (350 Research Projects) by 9 main Research Institutes covering both mulberry, vanya silk, pre and post cocoon activities
- Core research activities covering project specific facilities, SRF, JRF, fabrication of prototypes, field testing, demonstration, green house facilities
- Maintenance of Germ Plasm, Breeders stock, surveillance, monitoring
- Mobility, repair, infrastructure improvement, maintenance of infrastructure, Farm maintenance, creation of model farms, irrigation facilities, experimental plots
- Transfer of Technology, Establishment of Soil Testing Lab, disease forecasting, forewarning, Remote Sensing and GIS, Training
- Establishment of Regional Silk Technological Research Institute (RSTRS), Varanasi (UP), Regional Sericultural Research Station (RSRS) in Himachal Pradesh
- Improvement of facilities at CTR&TI, Ranchi, RTRS, Imphal and Bhimatal
- Establishment of Silkworm Seed Technology Lab (SSTL) for Vanya Silk Sector
- Establishment of Tasar P4 stations at Jharkhand, Chhattisgarh and Odisha.
- Replacement of condemned vehicles for mobility
- Cost for engaging skilled workers in R&D units for the skilled activities like; experimental food plant cultivation and maintenance, leaf plucking, pruning, application of farm yard manure (FYM) and fertilizers, cultural operations and irrigation, plant protection measures, disinfection, undertaking experimental rearing activities, grainages activities, field trials, laboratory works, watch and ward work during outdoor rearings for protecting crops from predators in natural Vanya food plantations, cocoon preservation, peduncle cuttings, collection of natural cocoons, sorting, pollarding of tasar food plants, transfer of larvae to the food plants, posts cocoon work in R&D laboratories and testing units like reeling, twisting deguming, silk processing etc. An expenditure of Rs.25.75 Cr has been incurred during first three years and a provision of Rs 37.44 cr has been proposed for 2015-16 and 2016-17 to meet the wages of skilled farm workers engaged in different field units

Restructure / Deepening of ongoing schemes for implementation during 2015-16 and 2016-17

Strengthening of Bivoltine Silkworm and Vanya Silkworm Breeding Laboratories.

Presently the sericulture in India is mostly multivoltine oriented, and a small quantity of bivoltine that is produced is not matching with the International quality. To produce high quality silk, superior robust bivoltine breeds and hybrids which sustain even under adverse climatic conditions prevailing in the tropical conditions are required to be developed. In order to take up silkworm breeding in this direction, it is essential to upgrade the facilities of the Bivoltine Breeding Laboratories of all the three major Mulberry Sericulture Research Institutes located at Mysore, Berhampore and Pampore and facilities under Vanya Silk Sector Breeding Laboratories at CTR&TI, Ranchi and CMERTI, Ladoigarh. The existing breeding laboratories will be upgraded by providing with the modern facilities and equipments to take up the breeding programme.

i. Development of silkworm breeds/hybrids, field testing and commercialization

i) In collaboration with foreign countries viz., China, Japan, Brazil, Bulgaria etc.

In addition to the available silkworm genetic resources, it is necessary to collect/pool the new germplasm accessions with better survival, high silk content and vigour for development of superior silkworm hybrids. By entering into bilateral collaboration with Countries, viz. Japan, China, Bulgaria, Brazil etc., new silkworm accessions with high silk content, disease tolerant and temperature tolerance can be obtained and used for developing high productive silkworm hybrids suitable to tropical and temperate conditions. Consultants from Japan and China will also be invited to work with the counterpart breeders in India to develop and fine tune the breeds suitable to Indian tropical conditions

ii) In collaboration with IISc, IITs and other reputed institutes within India

It is also necessary to take up more collaborative works with the reputed institute like IISc, IITs, CCMB etc., to develop high productive and hardy mulberry and vanya silkworm hybrids with the help of modern biotechnological tools.

III) Field Level Intervention towards quality and productivity improvement

- a. **Institute Village Level Programme** to be taken up in selected villages directly by the Main Institute to demonstrate the impact of improved technology packages as a model for further replication by the Departments of Sericulture to other Villages. Adarsh Gram Yojana of the Government of India will be taken up under this programme if the village selected is technically feasible for sericulture

- b. **Cluster Promotion Programme to be taken up by Research Extension Centre (REC)** covering two blocks where support will be provided for CRCs, improved Rotary Montages and production units for Biological inputs & Seric-Policlinics.
- c. **Model Cluster Promotion Programme to be taken up in North Eastern Region** by Research Extension Centre (REC) covering two blocks where support will be provided for Nurseries, CRCs, Rearing Houses, Equipment, disinfection etc. to establish the cluster as role model for the State Departments for further replication. 90 % subsidy will be given for individual farmers/reeler based activity and 100% for group based activities / Common Facility Centre. This programme has been taken up under NERTPS.
- d. **Support to CBOs:** Provision has been made for providing support for convergence programme. Support has been proposed to CBOs to meet the committed liabilities of the previous year.
- e. **Funding Pattern:** For the above mentioned ongoing scheme components 80% subsidy will be provided to individual oriented schemes (90% in case of special status States) and 100% subsidy for group oriented schemes. The beneficiary contribution is mainly in terms of labour and material input

IV Post Cocoon Sector

Following ongoing components will be implemented with minor modifications during last two years of XII Plan. It is proposed to implement the components through Central Silk Technological Research Institute (CSTRI) & its sub units in coordination with States with a sharing pattern of 75:25 for General States and 90: 10 for Special Status States between CSB and the Beneficiary.

Reeling & Spinning:

1. Support for establishment of Motorized Improved Charkas to dissuade child labour:

Turning / rotating charka in a Charka reeling unit is a manual activity and there is scope for engaging child labour for this. In order to discourage employment of child labour and to improve the working conditions in Charka units, it is proposed to support the establishment of motor driven improved twin Charkha units with required driving arrangements.

2. Support for establishment of Improved Cottage Basin Reeling Units:

Cottage basin system of reeling is an improved technology over Charka and provides better quality silk compared to Charkha. CSB has developed an improved cottage basin reeling technology package for producing better quality silk and it is proposed to support establishment of improved cottage basin reeling units.

3. Support for establishment of Multi-end Reeling units:

CSB has developed a Multi-end reeling technology package for production of international grade raw silk using quality multi x bivoltine and bivoltine cocoons produced in the country. The component envisages support for setting up of 6-Basin and 10-Basin multi end reeling units.

4. Support for establishment of Automatic Reeling units:

With a view to produce international quality raw silk from Bivoltine cocoons produced in the country, support is being provided for establishment of automatic reeling units. The component envisages support towards establishment of 400 ends / 200 ends capacity automatic reeling unit with latest technology for cocoon drying, cooking, reeling, re-reeling etc.

5. Support for establishment of Automatic Dupion Reeling units:

The double cocoons and inferior quality cocoons are converted in to dupion silk yarn on a dupion reeling machine. With a view to provide better value addition to inferior quality cocoons and produce international quality dupion yarn, support is given for establishment of Automatic Dupion Silk Reeling units with imported machinery.

6. Assistance for Twisting Units:

The objective of this component is to enhance profit margin of the multi-end reeling unit by adding a twisting unit so that the unit can go for value addition by way of selling their produce in the form of twisted silk. This component provides support for establishment of twisting units of 480 spindles along with winding and doubling machines.

7. Support for Cocoon Stifling & Cocoon Storage:

(a) Support for setting up of Hot Air Driers:

In Northern and North-Eastern States, sericulture is practiced as a seasonal activity. During the favourable seasons, cocoons are harvested and those harvested cocoons are to be dried & stored for long for its use over a period of six months. In most of the non-traditional States proper cocoon drying facility is not available and it is proposed to support establishment of hot air driers. It is also proposed to support setting up of Conveyor type Hot Air Dryer of 2 MT capacity as a Common Facility as there is a demand to this type of hot air dryers especially in the biannual cropping States like HP, Uttarakhand, J&K etc.

(b) Support for creating Cocoon Storage Facility:

After stifling the cocoons, it is important that these cocoons are stored properly till they are used for reeling. It is proposed to support the creation of standard cocoon storage facility in needy places. The cocoon drying and storage in such places shall work as a common facility benefiting the sericulture farmers and reelers of that region.

8. Support for Pupae Processing & Drying Units:

Silkworm pupa is the by-product of silk reeling which is used for various purposes. Separation of pupa and its treatment is important for better value realization for by-products and for addressing environmental issues associated with traditional pupa processing. The technology package developed by CSTRI aids separation of pelade waste from pupa, hot air drying of pupae with optimum drying conditions aiding storage of pupa for longer periods without fungal attack. It is proposed to promote preparation of pupa cake for export to countries like Thailand.

9. Support for Vanya Post Cocoon Sector:

(a) Reeling-cum-Twisting Machine: CSTRI has designed and developed a reeling-cum-twisting machine, which is suitable for both tasar and muga reeling. The mechanization of reeling and twisting in one single operation has some definite advantages viz., higher productivity, reduced labour, removal of drudgery and importantly producing better quality twisted yarn.

(b) Wet Reeling Machines (2-Basins of 4-ends each): Tasar reeling is predominantly a dry reeling activity. CSTRI has developed a wet reeling machinery and technology package for production of warp quality tasar yarn.

(c) Motorized / Pedal Operated Spinning Machine: To improve the productivity and quality of hand spun silk yarn, CSTRI has developed motorized/pedal operated spinning machine. This component has made a considerable impact in the field under earlier plan periods.

(d) Solar operated Spinning Machines: CSTRI has developed a spinning machine driven by solar energy to address the requirement of artisans of remote villages where availability of electricity is scarce.

(e) Unnathi Reeling cum Spinning Machine (Jharcraft): Jharcraft which is a Govt. of Jharkhand undertaking has designed and developed a two end reeling-cum-twisting machine which is time tested & suitable for tasar silk yarn reeling & twisting. These machines are well suited for operation on individual basis. The solar operated Re-Reeling Machine developed by Jharcraft will also be popularised

(f) Charaka Reeling machine: There is requirement of weft quality tasar yarn in tasar weaving clusters. In order to make available the required weft quality yarn, the CTR&TI Ranchi of CSB has developed an improved Charaka. The above machine is time tested & suitable for weft tasar yarn production.

(g) Two step Reeling cum twisting machine: This is a region specific tasar reeling cum twisting machine. The above machine has been developed by CSTRI as a region specific machine which can be used effectively for production of both warp as well as weft quality tasar silk yarn.

(h) Improved Cottage basin reeling machine for Tasar: This is a region specific tasar reeling machine developed on the lines of improved cottage basin for tasar raw silk production. The above machine has been developed by CSTRI as a region specific machine which can be used effectively for production of both warp as well as weft quality tasar silk yarn.

i) Tasar Reeling Machine to replace Thigh Reeling: Traditionally, tasar yarn is reeled manually by the women folk, using thigh for reeling & twisting. This manual process is unhygienic & cumbersome. In order to replace thigh reeling, a machine has been developed by the Reelers Community in Champa. The above machine is time tested & gives better quality yarn.

j) Bani Reeling Machine for Muga: CMR&TI of CSB has recommended the inclusion of Bani Reeling Machine for muga reeling as this is a tested and accepted region specific machine.

k) CSTRI studied the improved spinning wheel developed by Jharcraft. The machine is being standardised. This will also be popularised. All the vanya reeling and spinning devices will be provided 100% support

10. Providing services of Master Reelers and Technicians:

One of the major constraints for sustaining silk reeling industry in non-traditional States and non-traditional areas of traditional states is the absence of skilled reelers. To overcome this problem, the concept of deputing Master Reelers to existing silk reeling units to train the workers engaged in the units was introduced.

11. Support for Handloom Sector: It will be taken up through DC(Handlooms) with part financing from the State Government.

12. Vanya Silk Marketing Promotion (VSMP) and Product Design, Development & Diversification: A host of initiatives have been taken by CSB to promote these silks and their exports. Generic and Brand promotion in domestic / overseas markets, product design and diversification through R&D and collaborative projects, upgrading existing production technology, organizing exhibitions in major cities and sponsoring manufacturers to participate in domestic and overseas marketing events and exhibitions shall be focus areas under VSMP. Central Silk Board has established Product Design, Development & Diversification (P3D) Cell with the objectives like Quality up-gradation, Investment generation, Technology

absorption, Productivity improvement and Employment Generation. The P3D is involved in design & development of samples, modification in the structure of fabrics, improvements in the existing designs & finishes, diversification in use of silks/its bye-products viz. medical applications, technical textiles - thermal wear, silk non-woven, cosmetics, UV protective umbrellas etc. P3D is also involved in showcasing and exhibiting the new products and information dissemination of product information to entrepreneurs, exporters, fashion designers, consumers etc. The Cell works in coordination with NID, Weavers Service Centres, HHEPC, Regional Design Centre, NIFT etc. The Cell plays an active role in providing technical inputs in fabric engineering, process parameters, finishing, blending etc..

13. Flexi Fund:

It is proposed to create a Flexi Fund for the post cocoon sector to meet some of the need based requirement of the sector, which could not be met by the existing components suggested above. Some of the interventions which are proposed to be covered under the Flexi Fund are;

- 1) Additional support to machinery manufacturers to cover components like Turnkey concept, 3 years of AMC, initial hand holding and capacity building with a view to make the enterprise viable.
- 2) Innovative components aimed at quality & productivity improvement, use of non-conventional energy(both pre and post cocoon).
- 3) Incentivizing quality production like production of quality BV raw silk & incentivizing commendable performance in pre and post cocoon sector.
- 4) Interest subvention on working capital loan availed by reelers.

Capacity Building & Training

Growth and development of an industry or success of a project depends on the quality of manpower attached to it, their skill levels and their ability to learn and adapt to new technologies & skills-sets. Income generation is also believed to be directly related and proportional to the degree of development of desired skills and traits. Central Silk Board had realized the importance of training and capacity building fairly early and hence, in addition to being a R&D focused organization it has developed a strong training orientation.

Existing system of Capacity Building & Training in CSB:

The R&D institutions of CSB, spread across the country, covering all activities on the silk value-chain pertaining to all the four silk sub-sectors, are intensively involved in training, skill seeding and skill enhancement on a sustainable basis. They are fairly well

equipped with training infrastructure and facilities. These R&D institutes basically impart sector specific technology-based training to farmers, reelers, weavers, entrepreneurs, extension agents and other stakeholders of the silk industry. CSB also runs PG diploma courses for young science graduates and State Govt. sponsored officials both in Mulberry and Vanya sectors.

In addition, CSB has an ISO 9001:2008 quality certified Training Division at its headquarters that is responsible for assessing overall training and capacity building needs of the Silk industry and organizing a variety of skill-based training programmes for in-house officers/officials and also for the industry stakeholders, potential and existing entrepreneurs/investors.

These programmes are basically meant for:

- i) improving the level of information, technical knowledge and skill-sets
- ii) ii) encouraging entrepreneurship and investments in the silk sector, iii) exposing the participants to the latest Seri-technologies and practices for better productivity and production of quality silk and iv) motivating the industry stakeholders for taking up and practice silk production activities with added enthusiasm, commitment, technical perfection & futuristic perspective.

Proposed Capacity Building and Training (CBT) under Central Sector Scheme

The Capacity Building and Training (CBT) will be one of the six new components of the Central Sector Schemes on Silk. It has been planned to address the entire capacity building and skill training needs of the Silk Industry through this component with focused involvement of different wings of Central Silk Board. Further, it is proposed to continue the existing CDP sub-components viz. "Skill Training & Enterprise development Programmes (STEP)" and Sericulture Resource Centre (SRC) with modifications, whereas it is proposed to do away with "Beneficiary Empowerment Programme (BEP)" sub-component hitherto being implemented by respective States. The farmers' skill training requirements shall now be the responsibility of CSB R&D institutes and its nested units under the proposed new components. The details of planned initiatives under Capacity Building of Central Sector Scheme are indicated below :

- **Skill Training and Enterprise Development Programme**

Under "Skill Training & Enterprise development Programmes (STEP)" CSB, proposes to conduct a variety of training programmes to address the in-house and industry's capacity building requirements. The envisaged capacity building and skill training programmes will be organized covering all the silk sub-sectors and activities for the benefit of industry stakeholders and in-house human resources. Majority of the indicated programmes will be organized by the Training Division with the help of CSB units and identified 'CSB Zonal Trainers' In addition, CSB officers/officials will also be plugged in to useful training programmes conducted by other training agencies of national and international repute.

The details of planned training modules/progress under **Skill Training & Enterprise development Programmes (STEP)** along with the proposed unit cost, targets and fund requirement are indicated in the following table. Two new sub-components namely - i) “Specialized Overseas Training/ Exposure visit” in reputed international training hubs/ institutes and ii) “Training Impact Assessment Initiative” for gauging the impact of training conducted by CSB have been proposed. With more focus on Capacity Building and Training, internally the Training division shall be strengthened for desired results and visible impact.

#	Training component	Duration	Unit Cost (Rupees)	Physical target		Fund required (in Cr)	
				2015-16	2016-17	2015-16	2016-17
Skill Training & Enterprise development Programmes (STEP)							
1	Entrepreneurship Dev. Prog	3-4 wks	500,000/ batch	1	1	0.05	0.05
2	Foundation Trg for new recruits	3-4 wks	750000/ batch	2	0	0.15	0.00
3	Resource Development Prog	1-2 wks	350000/batch	4	6	0.14	0.21
4	Trainers Training Programme	3-5 days	250000/batch	2	0	0.05	0
5	Refresher Training for Scientific & Technical resource	1 wk	200000/batch	2	4	0.04	0.08
6	Competence Enhancement Training for Admn & Accts	3-5 days	150000/batch	0	4	0.00	0.06
7	Management Development Programme	1-5 days	500000 lump sum	25 persons	25 persons	0.05	0.05
8	Focused training for industry stakeholders	1-5 day	150000/batch	6	2	0.09	0.03
9	One day Lecture series	One day	25000/ prog	3	4	0.0075	0.01
10	Technology up-gradation prog	1-2 day	75000/ prog	3	2	0.0225	0.015
11	Specialized Overseas Training /Exposure visit	1 -12 wks	500000/ person	Lump sum	Lump sum	0.40	0.50
12	Training Impact Assessment initiative	At least 1 survey in each quarter	100000/ survey	4	4	0.05	0.05
13	Capital expenditure for purchasing training equipments	-	10,00,000	lump sum	lump sum	0.10	0.10
	TOTAL			30	30	1.15	1.155

Establishment of Sericulture Resource Centre (SRC)

The existing component “Sericulture Resource Centre (SRC)” is also proposed to be continued for the remaining period of XII Plan with revised unit cost of Rs.3.50 lakhs each. These training cum facilitation centres would be established in select Mulberry Bivoltine & Vanya clusters to act as an important link between Extension Centres of R&D labs and the beneficiaries. The purpose of these SRCs is - technology demonstration, skill enhancement, one-stop shop for Seri-inputs, doubt clarification and problem resolution at cluster level itself. SRCs will be managed by handpicked lead/ elite farmers or any ‘not for profit’ organizations, Seri-Societies etc for the benefit of cluster farmers/ sericulturist.

During the first three years a total of 29 SRCs were established and it is proposed to set up a total of 50 SRCs during the remaining period of XII plan. The revised unit cost for establishing and managing each SRC is proposed for Rs.3.50 lakhs, out of which, Rs.3.00 lakh (Capital) has been earmarked for meeting one-time expenditure of construction of Training shed (300 sq ft) and procurement of training /demo equipments viz. TV, projector, black board, basic furniture etc and Rs.0.50 lakh (Revenue) for meeting recurring and miscellaneous expenditure for conducting training. These SRCs would be mandated to conduct at least 12 training /demo sessions every year.

Component	Unit cost (Rs)	Revised Unit cost (Rs)	Year-wise achievement & physical target					Total
			2012-13	2013-14	2014-15	2015-16	2016-17	
Seri - Resource Centre								
Physical				02	27	20	30	79
Capital Expenses	100,000	300,000				0.60 Cr	0.90 Cr	1.50 Cr
Operational Expenses	150,000	50,000				0.10 Cr	0.15 Cr	0.25 Cr
Total	250,000	350,000				0.70 Cr	1.05 Cr	1.75 Cr

- **Capacity Building & Training by R&D Institutes of CSB**

In addition to conducting structured training programme (Post Graduate Diploma in Sericulture) the R&D institutes of CSB also conduct technology-based training and organize Krishi Melas, Farmer’s day, farmer’s interaction workshops etc. In the present proposal, in place of the existing Capsule and Ad-hoc training programmes, all the popular training modules have been restructured into three modules /sub-components (keeping in view the withdrawal of CDP component - Beneficiary Empowerment Programme) for the remaining two years i.e. 2015-16 & 2016-17 of the XII Plan.

#	Component	Duration	Unit cost (Rupees)	2015-16	2016-17	Total
1	Structured Training Programmes (Post Grad Diploma in Sericulture)	15 months	250000	0.052	0.052	0.10
2	Farmer's Skill Training	1-2 weeks	3500 / farmer	1.05 3000	1.05 3000	2.10
3	Exposure visits for farmers and grass root extension agents	1 week	2500 / person	0.25 1000	0.25 1000	0.50
4	Technology Orientation Programme	1-2 weeks	3500 / person	1.05 3000	1.05 3000	2.10
5	Organizing Resham Krishi Melas, Awareness programme, Workshops, Seminars, Group discussions, Breeders Meet, Scientists Meet etc.	1-2 days		1.00 100 progs	1.00 100 progs	2.00 200 progs
	Total			3.40	3.40	6.80

- **Capacity Building in Seed Sector:**

Silkworm seed is the most critical sector that drives the entire silk value chain. The quality of seed determines the quality of industry output. Therefore addressing the capacity building and training needs of this sector is of paramount importance. Different organizations of CSB managing different seed sub-sectors viz. Mulberry, Eri, Tasar & Muga are also responsible for Capacity Building and Training in seed sector. It is proposed to conduct a variety of training programmes as detailed below to cover industry stakeholders like – Pvt. Silkworm Seed Producers, Adopted Seed Rearers, Managers and work force attached to Govt. owned grainages. Depending upon the training need the duration of the envisaged training programme will vary from 1-4 weeks

#	Component	Duration	Unit cost (Rupees)	2015-16	2016-17	Total fund requirement (in Crores)
1	Mulberry : Training for ASRs, Training for Pvt Graineurs, Need-based Focused Training Progs	1 to 4 weeks	4200/per son	0.42 1000	0.42 1000	1.00 2000
2	Tasar sector : Training for ASRs, Training for Pvt Graineurs, Need Based Focused Training Programmes.	1 to 4 weeks	4200/per son	0.0.521 1240	0.521 1240	1.24 2480
3	Muga sector : Training for ASRs, Training for Pvt Graineurs, Need Based Focused Training Progs	1 to 4 weeks	4200/per son	0.16 375	0.16 500	0.44 875
4	Eri sector : Training for ASRs, Training for Pvt Graineurs, Need Based Focused Training Progs	1 to 4 weeks	4200/per son	0.105 250	0.105 250	0.26 500
	Total			1.19	1.19	2.38

- **Information, Education and Communication:** The scheme envisages print and media and publicity programmes, workshops, seminars, extension, publication, books, video films etc. . . .to educate the stake holders on latest technology packages.