

ITEC TRAINING

On

“POST COCOON TECHNOLOGY”

12th November to 9th December 2026



COURSE CONTENT

**CENTRAL SILK TECHNOLOGICAL RESEARCH INSTITUTE (CSTRI),
CENTRAL SILK BOARD, MINISTRY OF TEXTILES,
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Training on “POST COCOON TECHNOLOGY” under the Indian Technical and Economic Co-operation (ITEC), Ministry of External Affairs, New Delhi, India

1. INTRODUCTION:

India has the unique distinction of being the only country producing all the known commercial varieties of natural silk, viz., Mulberry, Tropical Tasar, Temperate Tasar (Oak Tasar), Eri and Muga. India ranks second among the silk producing countries of the world accounting for about 42% of the total global silk production with productivity level of 110 kg/ha. Central Silk Board (CSB), a statutory body under the administrative control of Ministry of Textiles has been entrusted with the overall responsibility of developing silk industry covering the gamut of sericultural activities in the country. Central Silk Board has its headquarters in Bangalore. Under the umbrella of Central Silk Board, good numbers of research institutions are working for the cause of technology development and Human Resource Development.

2. RATIONALE OF THE PROGRAMME

Trained human resource is one of the critical requirements for the production of quality silk at a reasonable cost. Sericulture is playing an important role in the economic development of many developing countries especially the rural poor. However, the industry in these countries needs trained technical personnel to transfer the technology to the rural mass. Training is one of the key areas of Central Silk Board's mandate and since its establishment, CSB has been playing a pivotal role in generating the required technical man power in most developing countries practicing sericulture. In this direction, CSB is organizing different training programmes at Central Silk Technological Research and Training Institute (CSTRI), Bangalore for the benefit of various stakeholders of post cocoon industry. These programmes are tailor-made to meet the specific needs of the sector and of immense help in updating the knowledge and skills of the stakeholders. This exercise is having the dual advantage of development of essential human resource for the industry and complementing the efforts of effective transfer of technologies to enhance income level of the stakeholders.

CSTRI is the only research institute in the country dedicated to the Research & Developmental activities related to silk technology. CSTRI was established in the year 1983 by the Central Silk Board, Ministry of Textiles, Govt. of India. Till then, silk technology had only the status of a division in the sericultural research institutes in the country. Appreciating the need for a greater thrust on the demand side of the silk industry, the establishment of CSTRI was the first step in the right direction. Today, CSTRI is recognized as one of the Textile Research Associations in the

country by the Government of India. The major mandates of the Institute are; quality improvement, productivity improvement, services to the industry, enterprise development and market information dissemination.

The Institute has been involved in training to stakeholders on the various aspects of the post cocoon technology of the silk industry. Recently; i.e. during 16-26 April 2017, this Institute has conducted International training programme on Post Cocoon Technology funded by the International Sericultural Commission. The institute has all the required facility to undertake such programmes fulfilling to international standards. During 2017, the “Centre of Excellence” facility under the Integrated Skill Development Scheme of Govt. of India has been established in this institute. The institute also possesses highly experienced scientific and technical personnel for imparting the training to various stakeholders.

3. DETAILS OF THE TRAINING PROGRAMME

Keeping in view of the requirements of the sericulturally developing countries, the training programme on “Post Cocoon Technology” in Central Silk Technological Research Institute, Bangalore for a period of 4 weeks would substantially help the developing countries to replicate the successful model of commercial sericulture practice developed in India. This would also create employment and livelihood opportunities in rural areas, thereby help the country alleviate poverty.

3.1. OBJECTIVES OF THE TRAINING:

1. To enhance the skill level in Post Cocoon Technology (PCT),
2. To understand the technological advancements in in Post Cocoon Technology (PCT),
3. To interact with the traditional Indian artisans on post cocoon technology,
4. To provide field exposure on the successful model of Indian sericulture practice,
5. To study the successful model of Indian sericulture practice for replicating in their countries.

3.2. CURRICULAM:

The programme will be of 28 days (4 weeks) duration and the batch strength will be 20 persons. The training programme will be conducted by covering the following subjects:

- a) Silk reeling
- b) Silk winding

- c) Silk doubling
- d) Silk Twisting
- e) Process calculations
- f) Warping
- g) Conceptualization of design
- h) Silk Dyeing and printing
- i) Silk Weaving
- j) Silk finishing
- k) Silk testing and grading

The above subjects will be covered mostly through practical and interactive sessions. Reeling, weaving of fabrics and other related activities would be undertaken during the training programme, wherein, the trainees themselves will participate and acquaint themselves with the practical aspects of all activities related to post cocoon technology. The Resource persons will use audio-visual methods for effective communication. The trainees will also be exposed to field activities among the industry stakeholders through field visits.

The day programme shall be as follows:

Day	Topics covered/Activity
Day 1 Thursday	Arrival, Registration and Orientation on ITEC Training
Day 2 Friday	Inaugural Function, visit to different Sections of CSTRI, P3D and International Sericultural Commission Lecture classes on Status of Indian silk Industry and the role of CSTRI in developing silk Industry in India, Competency of India in Global textile industry & Role of Training and Introduction to Mulberry Silk Reeling Technology (Process flow chart)
Day 3 Saturday	Theory class on Cocoon Quality & Grading, Marketing & price fixation, Cocoon Drying, Sorting & Storage; Technology of cooking in open pan, 2 pan, pressurized cooking & Cocoon permeation. Practical on Cocoon Assessment - 1 kg assessment, Shell Ratio%, Defective Cocoon%, Estimated Renditta
Day 4 Sunday	Holiday
Day 5 Monday	Technology of reeling on charkha, cottage basin, Multi end and Automatic reeling, By Products of silk Reeling and its utilization Practical on Single cocoon assessment on filament length, non-broken filament length & filament denier (AFL, NBFL, ASCFD), and Cocoon Sorting & Drying-Demonstration

Day 6 Tuesday	Objective of re-reeling, lacing, Skeining & Book Making, Importance of water quality in silk reeling, and Hands on training in reeling technology
Day 7 Wednesday	Outstation Tour to Mysore – CRC-Keerangere, Cocoon Market Ramnagaram and CSR&TI, Mysore, Halt at Mysore
Day 8 Thursday	Visit to Cold Storage, KSIC and sightseeing and back to Bangalore
Day 9 Friday	Introduction to non-Mulberry post cocoon technology and Practical of Non-Mulberry reeling and Hands on training in Mulberry reeling technology
Day 10 Saturday	Sustaining silk enterprises through the introduction of improved machineries, Raw silk Testing & grading and Practical on Raw silk testing & grading
Day 11 Sunday	Holiday
Day 12 Monday	Role of ISC in developing global Sericulture, Introduction to Silk Weaving Technology and Hands on training - Winding, Doubling & Twisting operations and Production Calculations for Winding, Doubling & Twisting
Day 13 Tuesday	Holiday - Festival
Day 14 Wednesday	Practical of Non-Mulberry reeling and Hands on training in Mulberry reeling technology. Introduction to Twisting Technology & Different types of twisted yarns as per end use and Practical Sessions on Silk Weaving Production Calculations for different warp patterns (Checks, Strips etc.); Demonstration & practice for Preparation of warp beam and drafting & denting and Basics of Weaving Mechanism
Day 15 Thursday	Weaving technology: Types of Handlooms & Handloom products, Practical Sessions on Basic Weaves, designs, drafting & peg plan on graph paper & preparation of designs for dobby & jacquards, pegging of lattice for Dobby design & punching of cards for jacquard
Day 16 Friday	Visit to Silkworm Seed Production Centre, Bangalore and study on all aspects of silkworm seed production technology, Bangalore local visit
Day 17 Saturday	Weaving technology: Types of Power loom & Shuttle less loom & various products, Practical Sessions on Basic weaves, designs, drafting & peg plan on graph paper and preparation of designs for dobby and jacquard, pegging of lattice for dobby design and punching of cards for jacquard and Computer Aided Designing Software Demonstration
Day 18 Sunday	Holiday

Day 19 Monday	Economics and Management of silk enterprises, Types of silk products viz; traditional & High-end fabrics (Soft silk, Tafetta, Crepe, Chiffon & Georgette fabrics) & Fabric defects and Practical Sessions on Fabric analysis & Fabric weight calculation (GSM, GLM etc), Hands on training in handloom weaving using individual designs
Day 20 Tuesday	Introduction to Silk Wet processing and role of water in silk processing, Introduction to degumming and bleaching of silk, Practical Training on Water testing, Practical Training on Silk Wet Processing, Silk Degumming, Silk Bleaching
Day 21 Wednesday	Theory class on Introduction to Silk Handicrafts, Making of Handicrafts items using Mulberry cut cocoons, Practical Training: Introduction to Silk Handicrafts, Making of Handicrafts items using Mulberry cut cocoons
Day 22 Thursday	Colour perception, Technology of silk dyeing using (acid, metal complex & Reactive dyes) different class of dyes, Practical Training on Silk Wet Processing and Silk dyeing (acid, metal complex & Reactive dyes) Technology of dyeing of silk using natural dyes & process of tie & dyeing of silk, Practical Training on Silk Wet Processing and Silk dyeing using natural dyes and tie & dye processes
Day 23 Friday	Visit to Universal Textile Mills, Attibele, a Silk Export Oriented Unit (EOU) having high speed looms (Rapier with Electronic Jacquard) and modern machineries on silk preparatory, weaving, dyeing, printing and finishing, Packed Lunch brought from Hotel and Sight-seeing in Bangalore
Day 24 Saturday	Technology of silk printing (Block, Screen, Batik etc.), Technology of silk finishing Practical Training on Silk Printing (Block, Screen, Tie-Dye & Batik), Physical Textile testing of silken material Chemical Textile testing of silken material and Practical Training on Textile testing of silken material (Physical & Chemical)
Day 25 Sunday	Holiday
Day 26 Monday	Silk exports & its prospects, and Practical Training on Textile testing of silken material (Physical & Chemical) About Flagship Programmes of India- Role of Silkworm Seed Production Technology in Silk sector, Role of RKVY for agriculture development in India, Non textile application of silk and silk beyond textiles (by product utilization) - Theory
Day 27 Tuesday	M/s Himmatsingka Seide Ltd/Weaving Cluster, Loopworm, Fibroheal in Doddaballapur, visit to local silk industry, Visit to Bangalore local sightseeing areas
Day 28 Wednesday	Country report presentation, Post Test, Feedback and Valedictory Function

3.3. SYLLABUS:

- Orientation,
- Presentation of Job Report by the participants,
- Brief introduction of silk industry in India with special focus on silk weaving and dyeing in different geographical regions.
- Undertake silk reeling activities
- Enabling the processing of silk winding using advanced methodologies.
- Processing of silk doubling in different format and methodologies.
- Preparation and conducting of silk twists as per the requirement of the end product.
- Estimating weaving preparatory calculations based on the type of end product.
- Understanding the process of warping for different type of fabrics.
- Synchronization process of designs with weaving for different type of weaving methods.
- Understand the properties of dyes, technologies and methods of dyeing and printing.
- Silk weaving on handloom and power loom in different type of looms.
- Methods and technologies adopted for silk finishing.
- Understand the various testing methods for testing and grading of cocoon and raw silk
- Extension education, extension communication methods, teaching aids, elements of learning, knowledge, skill and attitude, supervision, diffusion of innovations, etc.,
- Visit to important silk weaving clusters in south India, cocoon markets, silk exchange, department of sericulture, research institutes, etc.

3.4. ELIGIBILITY OF THE CANDIDATES

- Officials in Government, Public and Private Sectors, Universities, Chambers of Commerce and Industry, etc.
- Candidates should possess one year work experience in the related field.
- University Degree or other equivalent qualifications,
- Working knowledge of English required to follow the Course.
- Age between 25 to 45 years.
- Medically fit to undertake the training.

3.5. TEACHING METHODOLOGY:

The teaching shall be conducted by a group of highly experienced scientific personal, whose CVs are attached. The training methodology shall be on the following lines:

- Audio- Visual presentation,
- Case analysis,
- Group discussion
- Practical classes and demonstrations
- Interactive lecturing
- Interaction with field level stakeholders
- Learn from the industry partners through field visits

3.6. FACILITIES AVAILABLE

The Institute has all the necessary facilities for conducting training programmers. The important facilities are listed below:

- a) A “Centre of Excellence” facility with all facilities to undertake international training programmes
- b) Different type of reeling machineries with advance technologies,
- c) Different type of machines for weaving, dyeing, testing, designing, etc.,
- d) Well-equipped class rooms with audio-visual facilities,
- e) Well qualified and experienced faculty,

- f) Well equipped laboratories,
- g) Library facility with access to internet,
- h) 24 hours Security in the Campus, and
- i) Banking facility within the campus.

4. PARTICIPATING COUNTRIES

ITEC Member Countries

5. PERIOD OF TRAINING:

12th November to 9th December, 2026

6. EXPECTED OUTCOME:

The advanced training imparted to candidates from different countries would enable to enhance the productivity and quality of silk thereby improve their income level. The acquired skill could also be disseminated among other stakeholders for further improvement of the sector.

7. LOCATION OF THE TRAINING INSTITUTE:

The CSTRI, Bangalore, is located in Madiwala, i.e. in the southern part of Bangalore; on the Bangalore-Hosur Road at about 50 km from Bangalore International Airport. Bangalore, officially known as Bengaluru, is the capital of the Indian state of Karnataka. It has a population of over ten million, making it a megacity and the third most populous city and fifth most populous urban agglomeration in India. It is located in southern India on the Deccan Plateau. Its elevation is over 900 m (3,000 ft) above sea level, the highest of India's major cities. More details about the training institute can be obtained from their website <http://cstri.res.in/>.



8. ARRIVAL ASSISTANCE:

The trainees will be received at the Bangalore International Airport by the representatives of the training institute. The trainees shall be escorted to the hotel, which is about 50 kms and 90 minutes' drive.

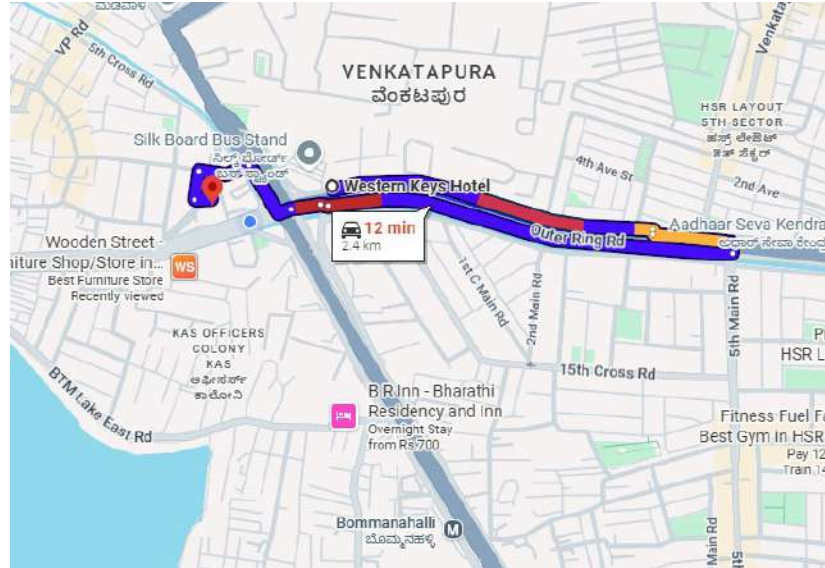
9. ACCOMMODATION:

The accommodation for the trainees is arranged at “Western Keys Hotel”, which is a three-star business property. The trainees shall be provided with single occupancy rooms, one bottle of mineral water per day, one pair of laundry and breakfast. The hotel has facilities like; prayer hall, fitness center, security systems, fire safety measures, lockers in the room, resident doctor, etc.

The address details of the hotel are as follows:

Western Keys Hotel

No. 756/I-189, 6th Sector, Silk Board Junction, next to BMTC Bus Stand,
Madiwala, 1st Block Koramangala, HSR Layout 5th Sector, Bengaluru, Karnataka,
560068, India



10. TRAINING ALLOWANCE:

The allowance admissible to the participants includes the cost of air passage, free tuition, living allowance and lodging as per availability of accommodation. INR 1500/- per day would be provided as Living allowance. The air ticket will be arranged by the Indian Mission in the respective countries. The living allowance shall be released by the training institute on weekly basis.

11. WEATHER :

Daytime temperatures usually reach 29°C in Bangalore in November with moderate heat and humidity, falling to 20°C at night. There are normally 5 hours of bright sunshine each day in Bangalore in November - that's 43% of daylight hours. There are usually 8 days with some rain in Bangalore in November and the average monthly rainfall is 128mm.

The trainees are advised to bring light winter cloths.

12. TOURIST ATTRACTIONS:

There are many tourist places within the city of Bangalore. The trainees may explore these places on holidays for which escort services would be provided by the institutes on request. The following are some of the places of interest:

- a) **Bangalore Palace:** Built by Chamaraja Wodeyar in 1887, the design of Bangalore Palace was inspired by England's Windsor Castle. As a result, this evocative palace has Tudor-style architecture with fortified towers, arches, green lawns, and elegant woodcarvings in its interiors. The royal family still lives here today, and the palace is open to the public from 10 a.m. to 5:30 p.m. on weekdays.
- b) **National Gallery of Modern Art:** If you're an art lover, don't miss visiting the National Gallery of Modern Art on Palace Road. This gallery, which opened in 2009, is the third of its kind in India (the others are in Delhi and Mumbai). It's housed in a Colonial mansion with a garden setting and has two interconnected wings, one of which features works from the early 18th century up until India's Independence while the other displays work from a large number of modern and contemporary artists. The gallery is open Tuesdays through Fridays from 11 a.m. until 6:30 p.m. and on Saturdays and Sundays from 11 a.m. until 8:00 p.m. There is a cafe on the premises as well, which is open fewer hours than the gallery itself.
- c) **Tipu Sultan's Palace and Fort:** Situated inside the Bangalore Fort area, Tipu Sultan's Palace was originally built by Chikkadeva Raya using mud. Later, Hyder Ali started reconstruction in Indo-Islamic architecture. This was completed by his son, Tipu Sultan, in 1791. The Hindu temple seen in the courtyard of the fort is the proof of Tipu Sultan's religious tolerance. The palace is open daily from 8.30 a.m. until 5.30 p.m.
- d) **Lalbagh Botanical Garden:** This expansive garden started out as a private Mughal-style garden for the city's royal rulers. It was established in 1760 by Hyder Ali and later extended by his son Tipu Sultan. It now covers 240 acres and derives its name from the red roses that bloom throughout the year there. The garden is said to have the most diverse species of plants in the world. Its focal point is a majestic glasshouse, built in 1889 to commemorate the visit of the Prince of Wales. It was designed along the lines of the Crystal Palace in London.
- e) **Cubbon Park:** Occupying a 300-acre area in Bangalore's business district, Cubbon Park is a popular place for walkers, joggers, nature lovers, and anyone who just wants to laze around. The park was named after the erstwhile Commissioner of Bangalore, Sir Mark Cubbon. Many ornamental and flowering trees, both exotic and indigenous, can be

found there. Kids will enjoy the special Bal Bhavan play area and aquarium inside the park.

- f) **Vidhana Soudha:** First opened in 1956, Vidana Soudha is a landmark of Bangalore and is located next to Cubbon Park. This enormous building is a massive example of neo-Dravidian architecture, complete with four domes on its four corners. It houses the Legislative Chamber of Karnataka Government and accommodates many other government departments. Unfortunately, it's not open to the public but is stunningly illuminated at night.
- g) **Spiritual and Religious Places:** Bangalore is the home of many of India's spiritual gurus, and the city has a rich religious culture. There are many diverse places of worship, including ashrams, mosques, and churches. Consider seeing many of the city's attractions on a Bangalore walking tour. It's also worth exploring the area around Bangalore. There are many places of interest, whether you're after an escape from city life or are a visitor who wants to spend a day enjoying the abundant beauty of Mother Nature.

13. CONTACT DETAILS:

For support and assistance, you may contact the following persons:

- a) **Dr. S. Periyasamy,**
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