

ITEC TRAINING

On

“POST COCOON TECHNOLOGY”

5 November to 2 December 2023



COURSE CONTENT

**CENTRAL SILK TECHNOLOGICAL RESEARCH INSTITUTE (CSTRI),
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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 22% of the total global silk production with productivity level of 98 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 possess 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 01

Arrival, Registration and orientation

Day 02

Inaugural Function , Visit to different Sections of CSTRI, P3D and International Sericultural Commission and 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 03

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 04

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 05

Objective of re-reeling, lacing, Skeining & Book Making, Importance of water quality in silk reeling, and Hands on training in reeling technology

Day 06 Outstation Tour to Mysore - Ramnagaram and Keerangere

Day 07 Tour Continued to Visit to Cold Storage, KSIC and sight seeing

Day 08- Holiday

Day 09

Introduction to Non-Mulberry post cocoon technology and Practicals of Non Mulberry reeling And Hands on training in Mulberry reeling technology

Day 10

Sustaining silk enterprises through the introduction of improved machineries, Raw silk Testing & grading and Practicals on Raw silk testing & grading

Day 11

Role of ISC in developing global Sericulture, Introduction of "The Chronicles of Silk" , Introduction to Silk Weaving Technology and Hands on training - Winding, Doubling & Twisting operations and Production Calculations for Winding, Doubling & Twisting

Day 12

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 13

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 14

Visit to Silkworm Seed Production Centre, Bangalore and study on all aspects of silkworm seed production technology.

Day 15 Holiday

Day 16

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 17

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 18

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 19

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 20

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)

Day 21 – Exposure Visit

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 22 Holiday

Day 23

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 24

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

Silk exports & its prospects, and Practical Training on Textile testing of silken material (Physical & Chemical)

Day 26 – Exposure Visit

M/s Himmatsingka Seide Ltd/Weaving Cluster in Doddaballapur

Day 27 – Exposure Visit

Visit to local silk industry, Visit to Bangalore local sightseeing areas

Day 28

Role of Silkworm Seed Production Technology in Silk sector, Role of RKVY for agriculture development in India, 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 established under the Integrated Skill Development Scheme of Govt. of India 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) Seminar hall,
- i) 24 hours Security in the Campus, and
- j) Banking facility within the campus.

4. PARTICIPATING COUNTRIES

ITEC Member Countries and ISC Member Countries

5. PERIOD OF TRAINING:

5 November to 2 December 2023
