

UNIT 5: ENTREPRENEURSHIP IN SERICULTURE -- PROSPECTUS OF SERICULTURE IN INDIA: SERICULTURE INDUSTRY IN DIFFERENT STATES, EMPLOYMENT POTENTIAL IN MULBERRY AND NON-MULBERRY SERICULTURE VISIT TO VARIOUS SERICULTURE CENTRES.

Silk is the most elegant textile in the world with unparalleled grandeur, natural sheen, and inherent affinity for dyes, high absorbance, light weight, soft touch and high durability and known as the “Queen of Textiles” the world over. On the other hand, it stands for livelihood opportunity for millions owing to high employment oriented, low capital intensive and remunerative nature of its production. The very nature of this industry with its rural based on-farm and off-farm activities and enormous employment generation potential has attracted the attention of the planners and policy makers to recognize the industry among one of the most appropriate avenues for socio-economic development of a largely agrarian economy like India.

Silk has been intermingled with the life and culture of the Indians. India has a rich and complex history in silk production and its silk trade dates back to 15th century. Sericulture industry provides employment to approximately 8.25 million persons in rural and semi-urban areas in India during 2015-16. Of these, a sizeable number of workers belongs to the economically weaker sections of society, including women. India’s traditional and culture bound domestic market and an amazing diversity of silk garments that reflect geographic specificity have helped the country to achieve a leading position in silk industry.

Silk production in India

India has the unique distinction of being the only country producing all the five known commercial silks, namely, mulberry, tropical tasar, oak tasar, eri and muga, of which muga with its golden yellow glitter is unique and prerogative of India.

Mulberry sericulture is mainly practised in five states namely, Karnataka, Andhra Pradesh, Assam and Bodoland, West Bengal, Jharkhand and Tamil Nadu are major silk producing states in the country. North East has the unique distinction of being the only region producing four varieties of silk viz., Mulberry, Oak Tasar, Muga and Eri. Overall NE region contributes 18% of India's total silk production. India is the second largest producer of silk in the world. Among the four varieties of silk produced in 2015-16, Mulberry accounts for 71.8% (20,434 MT), Tasar 9.9% (2,818 MT), Eri 17.8% (5,054 MT) and Muga 0.6% (166 MT) of the total raw silk production of 28,472 MT.

The demand for superior quality bivoltine silk is increasing in India for domestic consumption as well as value added silk products for the export market.

The Ministry of Textiles Government of India and Departments of Sericulture in various states provide technical and financial assistance for enhancing the bivoltine silk production.

Policy initiatives recently taken for the development of silk industry

Sericulture is the functional area under the Ministry of Textiles. Some of the recent policy initiatives taken by the Ministry to promote sericulture are as follows.

- Sericulture is included as agriculture allied activity under RKVY. This enables the sericulturists to avail the benefits of the scheme for the entire sericulture activities up to reeling.
- The CSB (Amendment) Act, Rules and Regulations have been notified by the Govt. of India to bring quality standards in silkworm seed production.
- Forest Conservation Act has been amended to treat non mulberry sericulture as forest-based activity enabling the farmers to undertake Vanya silkworm rearing in the natural host plantation in the forests.
- Anti-dumping duty on Chinese raw silk - The Director General of Antidumping & Allied Duties (DGAD), New Delhi has recommended imposition of antidumping duty on Chinese raw silk of 3A Grade & Below in the form of fixed duty of US\$ 1.85 per Kg on the landed cost of imported raw silk vide notification No.14/17/2014/DGAD dated 4-12-2015.
- CDP-MGMREGA convergence guideline have been finalized and issued jointly by the MOT and MORD. These guidelines will help sericulture farmers to avail assistance from MGNREGA scheme.

What is Sericulture

Sericulture means silk farming. The word 'Sericulture' is derived from the Greek word 'Sericos' meaning 'Silk' and the English word 'Culture' meaning 'Rearing'. Sericulture plays a significant role in the rural economy of India, is not bound to just worms, but includes all activities related to the silk culture like mulberry cultivation and even post-cocoon technology. Today, India and China are the two main producers, with more than 60% of the world's annual production.

Who is a Sericulturist

Innovative researchers have turned sericulture into an industry and now it has become a major cash crop of the country. The sericulture industry is unique for more than one reasons. It is based on agricultural output specifically cocoons and cottage-based labor intensive in nature.

What are the educational requirements to become a sericulturist

- One of the options is to pursue a bachelor's degree in Sericulture is right after Class XII.
- To pursue this one needs to have a background in science. There are two types of degree, B.Sc. (Sericulture) and B.Sc. Silk Technology (Sericulture).
- To pursue a Master's degree, one must complete graduation in the same or related fields of agriculture or sericulture.
- There is also immense scope for research and development in this field, where one can obtain a Ph.D. or even a post-doctoral.



Into the technology of sericulture

What is the scope of being a Sericulturist

Since agriculture is a basic need for humans, there is always a lot of scope in this field of study. With the advent of technology and developments that come with it, there has been a wide variety of job opportunities in both public and private enterprises.

What are the career options in Sericulture

- Sericulture offers career opportunity in Govt. research centers, silk boards, academic fields, sericulture units, agriculture sector banks etc.
- One can get jobs in Central Government agencies like Central Silk Board/Silk Export Promotion Council/Fao/Nabard, Krishi Vigyan Kendra etc.
- Candidates with M.Sc. sericulture can apply for the post of lecturer, professor and lab assistant. Sericulturists can find employment as officers, managers in the agricultural loan sector of nationalized as well as private banks.
- Consultants with in-depth and updated knowledge of the field are also in demand, especially to provide guidance for the setting up of sericulture farms.

Salary scale:

Professionals who undergo proper training can earn starting salaries as high as Rs 15000/- per month in public sector and even higher in private sector and NGOs.

Those who set up business as exporters of silk products can have good gains.

Top colleges/ universities in India for Sericulture

- Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu: Faculty of Agriculture, Jammu (Tawi)
- Shivaji University, Kolhapur
- Tamil Nadu Agricultural University, Coimbatore
- University of Agricultural Sciences - UAS Bangalore, Bangalore
- Babasaheb Bhimrao Ambedkar University, Lucknow
- Central Sericultural Research and Training Institute, Mysore (Karnataka)
- University of Delhi, New Delhi
- Assam Agricultural University, Jorhat

History

Silk - the queen of all fabrics is historically one of India's most important industries. India produces a variety of silks called Mulberry, Tasar, Muga and Eri, based on the feeding habit of the cocoons. The sericulture industry today in India employs over 700,000 farm families and is mostly concentrated in Karnataka, Tamilnadu and Andhra Pradesh and to some extent Assam and West Bengal. Karnataka accounts for more than 70% of the country's total silk production.



India Silk Industry is second largest producer of silk, contributing to about 18% to the world production. What is however, more noteworthy is the fact that India's requirement of raw silk is much higher than its current production at present. So there is considerable scope for stepping up production of raw silk in the country, overcome the persistent conflict of interest between exporters of silk products and producers of raw silk.

Brief introduction

Silk industry occupies a unique position in India. Today Indian Sub Continent is the second largest silk manufacturer contributing to 18% of the total raw silk production. Sericulture is an important cottage industry in India. This is a labor intensive industry operating on around 54,000 villages all over the country. An assortment of silk varieties such as Mulberry, Tasar, Eri, Muga etc are grown. The industry is generous enough providing job opportunities, and livelihood for more than 6 million people in the rural areas.



The Indian Silk industry has shown significant growth both domestically and internationally fuelled by new innovations in the field. The ability of the industry to grow is combined with huge innovation opportunities coupled with the skills of the craftsman.

The India silk industry is an integral part of the Indian Textile Industry and is among the oldest industries in India. The silk industry in India engages around 60 lakh workers and it involves small and marginal farmers.

India is the second largest producer of silk, taking care of about 18 percent of world production. But what is so remarkable is the fact that the requirement of raw silk in India is much higher than the current production. So there is considerable scope for increased production of raw silk in the country a way out of the conflict of interests between exporters and producers of silk raw silk.

Today the Indian silk industry is already a major player in the global scenario and growth prospects for the sector appear to be bullish. Measures such as promoting further economic and technological research activities in various aspects of sericulture, standardization and quality control of products from silk are needed. Rationalization of the marketing and stabilization of the prices of silk cocoons and raw silk could expand rapidly than ever.

Market capitalization

The Ministry of Textiles, Government of India has guided the Central Silk Board for the steps to be taken to revive this sick industry. Indian Government has collaborated with the Japanese Government for technology cooperation for increased cultivation and use of bivoltine seeds. Further, the 10th Plan had envisaged an increased silk production of 21,800 MT, increased exports by 15%, and creation of livelihoods for around 61 lakh people by the next few years.

Size of the industry

The production output of Indian Silk industry in India is 17,300 tons of silk and the country produces 4 types of silk viz., Mulberry, Muga, Tassore, and Eri. The crux of India silk industry lies with the metropolitan states of the country like Karnataka, Andhra Pradesh, Tamil Nadu, Jharkhand, Chhattisgarh, Odisha, Jammu & Kashmir and West Bengal. The "Sericulture" or rearing of silkworm revolves around these Indian states where the farming of silk is concentrated in these states only. Sericulture usually involves rearing of food plants - the mulberry plants, rearing of the silk insect, and finally post-cocoon processes such as twisting, dyeing, weaving, printing, and finishing.

Top leading Companies

- Eslarr Enterprise
- Libas Group
- Satyashree Silks & Sarees
- Sakhi Fashions
- Obadiah International
- Aurum Exims
- Om Shree Silk India International Pvt Ltd
- Sreecreations
- Gini Silk Mills Limited

Employment Opportunities

The Silk Industry in India is generous enough providing job opportunities, and livelihood for more than 6 million people in the rural areas. The Indian SILK industry has shown significant growth both domestically and internationally fuelled by new innovations in the field. The ability of the industry to grow is combined with huge innovation opportunities coupled with the skills of the craftsman.

Sericulture is one industry in the nation which is beneficial to the agriculturists. Today 56 lakhs people are dependent on the sericulture industry in the country, 5.6 million people out of which 4.7 million are agriculturists. The rest are reelers, weavers, etc.

Latest developments

- India is second only to China in silk production. While China produced 69,000 tons of raw silk last year, India was far behind with 16,000 tonnes.
- Officials say that India needs 120,000 tonnes of silk and with better infrastructure, the sericulture industry could improve its productivity by 15 percent, against the current nine percent.
- Andhra Pradesh's Sericulture Research Institute has developed a virus-resistant transgenic silkworm. This silkworm would help in stabilizing silk yield levels by reducing uncertainties like viral outbreaks and this research has also helped in understanding the traits which induce silkworms to eat only mulberry leaves.

Sericulture:

It is an **agro-based industry**.

It involves **rearing of silkworms** for the production of raw silk, which is the yarn obtained out of cocoons spun by certain species of insects.

The major activities of sericulture comprise of food-plant cultivation to feed the silkworms which spin silk cocoons and reeling the cocoons for unwinding the silk filament for value-added benefits such as processing and weaving.

Domesticated silkworm (Bombyx mori) are raised for the purpose of sericulture.

- The **Government of India** has allocated ₹2161.68 crores for three years i.e. **2017-2020** to its **Central Sector Scheme 'Silk Samagra'** for the development of sericulture in the country.

- **Silk Production in India:**

There are **five major types of silk of commercial importance**, obtained from different species of silkworms. These are **Mulberry, Oak Tasar & Tropical Tasar, Muga and Eri**.

Except for mulberry, other non-mulberry varieties of silks are **wild silks**, known as **vanya silks**.

India has the **unique distinction of producing all these commercial varieties** of silk.

South India is the leading silk producing area of the country and is also known for its famous silk weaving enclaves like **Kancheepuram, Dharmavaram, Arni**, etc.

Sl no	State	Silk Centre
1	Andhra	Dharmavaram, Pochampalli, Venkatagiri, Narainpet
2	Assam	Sualkuchi
3	Bihar	Bhagalpur
4	Gujarat	Surat, Cambay
5	Jammu & Kashmir	Srinagar
6	Karnataka	Bangalore, Anekal, Ilkal, Molakalmuru, Melkote, Kollegal
7	Chattisgarh	Champa, Chanderi, Raigarh
8	Maharashtra	Paithan
9	Tamil Nadu	Kanchipuram, Arni, Salem, Kumbhakonam, Tanjavur
10	Uttar Pradesh	Varanasi
11	West Bengal	Bishnupur, Murshidabad, Birbhum

Sericulture is practiced in about 52,360 villages all over the country and **employment** to about 7.56 million people, most of them being small and marginal farmers in rural areas, creating **employment** to at least for 12-13 people per hectare of mulberry.

India is the Second largest producer of silk in the World. Among the four varieties of silk produced, in 2014-15, Mulberry accounts for 74.51% (21,390 MT), Tasar 8.5%

(2,434 MT), Eri 16.5% (4,726 MT) and Muga 0.55% (158 MT) of the total raw silk production of 28708 MT.

Production of raw silk in India during the year 2015-16 (April to August-2015) has been 9,590 MT in which, mulberry and Vanya raw silk output amounts to 7,053 MT and 2,537 MT, respectively.

PERFORMANCE OF SERICULTURE SECTOR

	XI Plan (2011-12)	XII Plan (2012-17)	XII Plan Achievements			
	Achment.	Target	2012-13	2013-14	2014-15	2015-16* (p)
Mulberry Plantation (Lakh ha.)	1.81	2.40	1.86	2.03	2.20	2.20
RAW SILK PRODUCTION						
Mulberry (Bivoltine)	1,685	5,000	1984	2,559	3,870	1,696
Mulberry (Cross Breed)	16,587	18,000	16731	16,917	17,520	5,357
Sub Total (Mulberry)	18,272	23,000	18,715	19,476	21,390	7,053
V A N Y A						
Tasar	1,590	4,562	1729	2,619	2,434	221
Eri	3,072	4,238	3116	4,237	4,726	2,234
Muga	126	200	119	148	158	82
Sub Total (Vanya)	4,788	9,000	4964	7,004	7,318	2,537
GRAND TOTAL	23,060	32,000	23,679	26480	28,708	9,590
Cumulative Employment Generation (Lakh persons)	75.60	92.42	76.53	78.50	80.30	---

RAW SILK IMPORTS:

The quantity and value of raw silk imported during XI Plan and during the first 4 years of XII Plan are given below:

Year	Quantity (MT)	Value (Rs. in Crores)
XI Plan (2011-12)	5683	1111.53
XII Plan 2012-13	4959	1238.56
2013-14	3260	896.44
2014-15	3489	970.82
2015-16* (p)	1443	412.47

EXPORTS:

The Indian silk goods are being exported to the traditional major markets like the USA and European countries and small markets of Asia Region. The silk goods export earnings decreased over the years due to global recession. The export earnings during 2014-15 were Rs.2,829.88 crores. Export values of silk goods during XI Plan and during the first 4 years of XII Plan are given below:

Items	XI Plan (2011-12)	2012-13	2013-14	2014-15 (p)	2015-16* (p)
Natural Silk Yarn	19.68	21.96	36.25	25.38	5.51
Silk Fabrics	1497.97	1410.31	1455.63	1465.40	255.30
Readymade Garments	765.83	787.15	874.00	1214.01	850.58
Silk Carpet	20.08	21.14	15.71	15.97	6.52
Silk Waste	49.77	62.97	99.30	109.12	38.19
Total	2353.33	2,303.53	2480.89	2829.88	1156.10

EMPLOYMENT GENERATION:

The employment generation in the country is raised to 8.03 million persons in 2014-15 compared to 7.85 million persons in 2013-14, indicating a growth of 2.29%.

SCHEMES/PROGRAMMES OF THE CENTRAL SILK BOARD

The mandated activities of CSB are Research and Development, Research Extension, maintenance of four tier silkworm seed production network, leadership role in commercial silkworm seed production, standardizing and instilling quality parameters in the various production processes, promotion of Indian Silk in domestic and international markets and advising the Union Government on all matters concerning sericulture and silk industry. These mandated activities of Central Silk Board are being carried out by the 324 units of CSB located in different States under the following four Central Sector Schemes:

1. Research & Development, Training, Transfer of Technology and I.T. initiatives.
2. Seed Organization, Coordination and Market Development (HRD).
3. Quality Certification Systems and Export Brand Promotion & Technology Up-gradation.
4. Catalytic Development Programme (Centrally Sponsored Scheme now restructured as Central Sector Scheme and merged with R&D and Seed schemes).

RESEARCH AND DEVELOPMENT (R&D)

The main Research & Training Institutes of the CSB provide scientific and technological support for enhancing production and productivity for sustainable sericulture through innovative approaches. The main institutes at Mysore (Karnataka) Berhampore (West Bengal) and Pampore (J&K) deal with Mulberry sericulture whereas Ranchi (Jharkhand) deals with Tasar culture and Ladoigarh, Jorhat (Assam) deals with Muga and Eri culture. Regional Sericulture Research Stations (RSRS/RTRS/RMRS) for Mulberry and Vanya sericulture have been functioning for the development of region-specific technology package and dissemination of research findings as per regional needs. Besides, a network of Research Extension Centre (RECs) & its sub units for mulberry and vanya silk are also functioning to provide extension support to sericulturists. 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 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 the year 2015-16, up to the end of September 2015 a total of 8 new research projects have been initiated and 16 projects have been concluded by various R&D institutes of CSB and currently a total of 90 research projects viz., 64 in Mulberry Sector, 16 in Vanya Sector and 10 in Post cocoon sector are under progress.

Highlights of Research programmes:

Mulberry

- ❖ The hybrids that were identified through Post Authorization programs

such as CSR16xCSR17, MH1xCSR2 in south zone, FC1xFC2, M. con1xB.con4, M. con4xB.con4, M. con1xM.con4 in East and North-East, CSR46xCSR47 FC1xFC2 and APS5xAPS4 in North and North-West are under popularization for commercial exploitation.

- ❖ Two new bivoltine hybrids viz., G11xG19 and B. con1xB.con4 with better yield and adaptation are in the 2nd year of the authorization trials.
- ❖ Four new mulberry varieties viz., C2038, G4, Suvarna-2, Tr-23 are under All India Coordinated Experimental Trials. In South G4 and in East and North C2038 and in hilly areas Tr-23 are performing better than other varieties.
- ❖ The field trial of improved L14xCSR2 hybrid recorded cocoon yields up to 63kg/100 Dfls at farmers' level.
- ❖ Developed an improved crossbreed (L14 x S8) through hybrid evaluation tests utilizing improved L14 lines and new bivoltine male components. Four thermo-tolerant silkworm lines were developed utilizing SSR markers (LFL0329 & LFL1123) associated with thermo-tolerance.
- ❖ Identified low temperature stress tolerant mulberry genotypes with high leaf yield viz., C-108 (15.4 mt) in C-384 (9.7 mt) and C-212 (9.2 mt).
- ❖ C-2028, a water logged tolerant mulberry variety is being popularized in West Bengal, Assam and other Eastern and North Eastern States.
- ❖ The NPV tolerant bivoltine silkworm hybrid MSN4 xCSR4 is performing better than control under field testing.
- ❖ Evaluation trials confirmed the safe employment of the 4, 6, 8- and 10-months hibernation schedules for preservation of the bivoltine silkworm breeds SK₆ and SK₇ and tropical Univoltine race Barpat.
- ❖ 1269 Mulberry Germplasm accessions are being conserved in the *ex situ* field gene bank.
- ❖ 458 silkworm germplasm stocks (77 Multivoltine, 361 Bivoltine and 20 mutants) are being maintained through scheduled rearing.

Vanya Silk

- ❖ Tasar Daba bivoltine silkworm 'BDR-10' is under popularization.
- ❖ A new Tasar silkworm line "CTR-14" is under field testing.
- ❖ Eri silkworm breed 'C2' is under popularization.
- ❖ Rearing of selected superior lines of hybrid progenies (CMR-1) as well as backcross line (CMR-2) is being continued.

- ❖ Insect Repository has been established at CMERTI, Lahdoigarh.
- ❖ Identified an alternative food plant *Lagerstroemia speciosa* for Tasar silkworm rearing, which is easy rooter and fast growing. Trials are on to validate the rearing performance.
- ❖ Two Som accessions (S3 & S6) resistant to leaf spot disease, leaf blight and rust are being popularized in the field.

Post Cocoon

- ❖ Demonstration of Indigenous Automatic Silk Reeling Machine (ARM) to produce superior quality import substitute silk is being done using concept model.
- ❖ Demonstration of Solar powered low cost spinning machine that can be operated in rural areas by harnessing solar power.
- ❖ Popularization of Low cost eight end multi-end reeling machine for tasar silk reeling.
- ❖ In Vanya silk post cocoon sector Popularization Wet reeling of tasar and Muga cocoons, Sizing machine for tasar silk, Modified dry reeling machine for tasar cocoons, Pressurized hank degumming machine and Equipment for recycling of silk reeling water are being popularized in field.
- ❖ Demonstration of Pellade extraction and pupa separation machine to remove pellade layer from spent silkworm pupae.
- ❖ Developed three varieties of Chanderi sarees (Silk x Silk).
- ❖ Developed technology of “Use of Slug catcher (as replacement for porcelain button) for Slug removing” and is being field tested.
- ❖ Developed technology of “Yarn degumming using CSTR Eco degumming machine” and is being field tested.

Patents & Commercialization:

a. Patents obtained:

1. Peddle operated composite cocoon harvester.
2. Mountages used for production of cocoon
3. Manually operated matured silkworm separator and collector

b. Applications filed for patenting:

1. Six patent applications were filed to National Biodiversity Authority for clearance. Preparation of pupa powder
2. Culturing of Cordyceps

3. Use of spent silkworm moths
4. Pupae for human food
5. Preparation of pupae oil and
6. Preparation of silkworm powder

C. Commercialization of Technologies:

- ❖ MoUs entered with the manufacturers of Samruddhi, Serimore and Sanitech Super for the commercial utilization after thorough technical evaluation.

Transfer of Technology (TOT):

The technologies emanated out of the concluded projects are being effectively transferred to the field through various extension communication programmes viz, Krishimelas, Group Discussions, Enlightenment programmes, Field Days, Farmers' Meet, Audio Visual programmes, Technology demonstrations etc. During 2015-16, up to the end of August, a total 379 ToT programmes have been organized and 41 technologies were transferred effectively to the user level. Further, 50,838 cocoon and silk samples have been tested under post cocoon technology.

Collaborative Research Projects and Biomaterial Research:

- 1) The R&D institutes of CSB, in addition to the in-house funded projects, are also carrying out collaborative research projects with the financial assistance from DBT, DST, PPV and FRA, ILRI Ranchi etc. During 2015-16, a total of 18 research projects with external funding are being carried out.
- 2) CSB Institutes also collaborate with other research Institutes such as IIT Kharagpur, IARI New Delhi, CCMB Hyderabad, NIFT Tirupur, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, Kerala, BTRA Mumbai, Coir Board, GKVK Bangalore, NEIST Jorhat, TERI Bangalore, BIT Mesra and NCL Pune. At present, 12 such projects are being carried out.
- 3) International collaboration with different institutes has also been undertaken. One project aiming at developing DNV resistant silkworm has already been initiated with Japan while another project is being carried out with Bulgaria on breed improvement.

SERICULTURE DEVELOPMENT IN NORTH EASTERN STATES

North East has the unique distinction of being the only region producing four varieties of silk viz., Mulberry, Ok Tasar, Muga and Eri. Overall NE region contributes 17% of India's total silk production. As on 2014-15, approximately 80,020 hectares of land is covered under different varieties of silkworm food plants in NE States, 16127 Sericulture villages and 3,36,423 families are directly involved in Sericulture activities.

The production of all varieties of raw silk during the year 2015-16 (Upto August-2015) in North East States as given below:

Production 2015-16 (Upto August-2015) {Prov}				(Qty: in MT)
Mulberry	Tasar	Eri	Muga	Total
119.12	2.39	2231.6	81.61	2434.75
		3		

North East Region Textile Promotion Scheme

In order to boost the textile sector in the NE region, the Govt of India has approved a project- based strategy for the North East Region under an umbrella scheme by name “North East Region Textile Promotion Scheme”. The broad objective of the North East Textile Promotion Scheme is to develop and modernize the textile sector in the North East Region by providing the required Government support in terms of raw material, seed banks, machinery, common facility centres, skill development, design and marketing support etc. Under NERTPS various sericulture projects have been approved under two broad categories viz., ISDP and IBSDP.

I. Integrated Sericulture Development Project (ISDP)

So far 11 sericulture projects with a total cost of Rs. 483.35 crore (Gol share of Rs.385.17 crores) have been approved for implementation in NE States for a period of 3 years from 2014-15 to 2016-17. While 10 projects are meant for implementation by States, 1 project for Seed Sector infrastructure development with a cost of Rs.37.71 crore is for CSB (Mulberry, Eri and Muga sectors).

The details of physical target and financial target & achievement (till September-2015) are indicated below:

State	Total Cost (Crores)	Gol share (Crores)	Gol Release till Sept-2015 (Crores)	Benef. to be covered (Nos)	Output during Project (MT)
Assam	66.67	47.42	14.67	3,265	196
BTC	34.92	24.68	8.22	1,576	171
Ar. Pradesh	18.42	18.42	7.19	1,362	79
Manipur	149.76	126.60	30.08	2,896	450
Manipur (for Hill Districts)*	30.39	24.67	7.75	1,514	68
Meghalaya	30.16	21.91	7.30	1,466	162
Mizoram	32.49	24.49	8.16	1,811	117
Nagaland	31.47	22.66	7.55	1,898	166
Tripura	47.95	33.20	11.06	3,510	275
Tripura (for Printing)	3.41	3.41	1.20		1.50 lakh mts./yr
Creating Seed Infrastructure for CSB	37.71	37.71	12.57	--	30 lakh Mulberry & 21.50 lakhs Muga / Eri dfls / yr
Total	483.35	385.17	115.77	19,298	1,684

II. Intensive Bivoltine Sericulture Development Project

Besides the above, 8 Intensive Bivoltine Sericulture Development Projects for all NE States except Manipur, with a total cost of Rs.236.78 crores (Gol share of Rs. 210.41 crores) have been approved for production of quality bivoltine silk. The project aims to develop mulberry sericulture in two Blocks of one District in each State for a period of 3 years (2015-16 to 2017-18) involving women beneficiaries. The fund sharing of the projects is among Govt. of India and Beneficiaries. No State share has been proposed in the Project. However, State shall provide land and other facilities including manpower.

The State-wise fund sharing & release (till Sept-2015), physical target and Raw Silk output during Project period in respect of the approved projects are indicated below:

State	Total Cost (Crores)	Gol share (Crores)	Gol Release till Sept-2015 (Crores)	Benef. to be covered (Nos)	Raw Silk Output during Project (MT)
Assam	29.55	26.28	5.50	1100	29
BTC	30.06	26.75	5.50	1200	26
Ar. Pradesh	29.47	26.20	5.50	1100	20
Meghalaya	29.01	25.77	5.50	1000	27
Mizoram	30.15	26.87	5.50	1100	26
Nagaland	29.43	26.16	5.50	1100	27
Sikkim	29.68	26.43	5.50	1050	27
Tripura	29.43	25.95	5.50	1100	27
Total	236.78	210.41	44.00	8750	209

The above 19 projects are presently under implementation. Member Secretary, CSB and other Technical Officers / Scientists have visited Manipur from 12th to 15th October for field evaluation in project areas as a part of concurrent evaluation, review of project implementation, participation in Krishimelas and Workshop with functionaries and stake holders from all districts of Manipur. The projects are being effectively implemented and the progress of 2014-15 is satisfactory. The components under the projects have been thoroughly reviewed in PIMC meeting held at Imphal and the progress is satisfactory. In the krishimela held at Imphal, cocoons produced in different districts of the project during first autumn crop were brought for marketing.

State wise Raw Silk production during 2012-13 to 2015-16

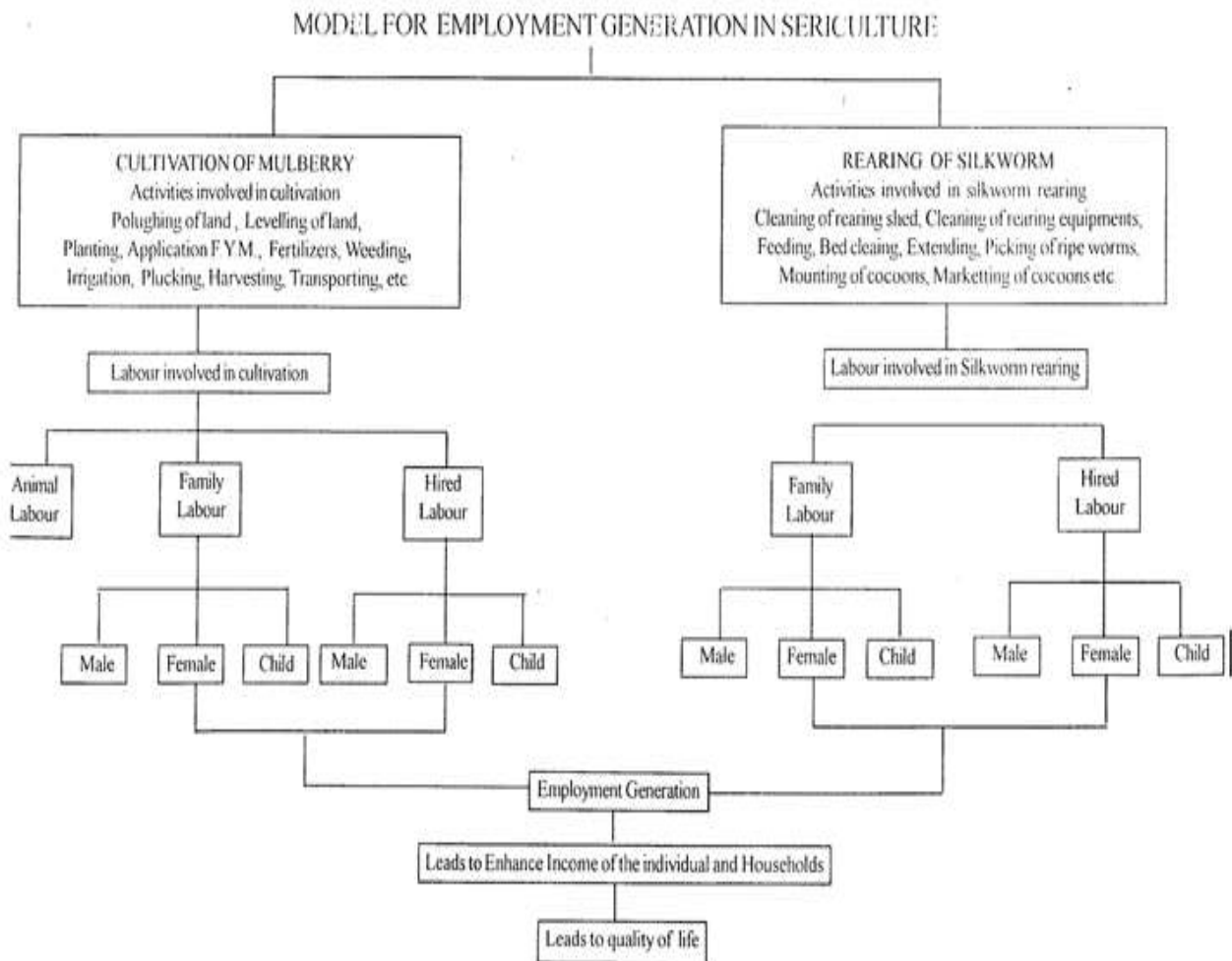
(in MT)

#	State	Achievement			
		2012-13	2013-14	2014-15	2015-16(P) (upto Aug-2015)
1	Karnataka	8219	8574	9645	3576
2	Andhra Pradesh	6550	6912	6485	1558
3	Telangana			101	27
3	Tamil Nadu	1185	1120	1602	776
4	Kerala	6	4	7	3
5	Maharashtra	97	122	221	74
6	Uttar Pradesh	157	188	236	36
7	Madhya Pradesh	190	195	248	24**
8	Chhattisgarh	391	391	234	37
9	West Bengal	2070	2079	2500	687
10	Bihar	22	52	53	1.34*
11	Jharkhand	1090	2003	1946	180*
12	Odisha	104	53	98	1.74
13	Jammu & Kashmir	145	136	138	131
14	Himachal Pradesh	23	25	30	25
15	Uttarakhand	17	22	29	16
16	Haryana	0.13	0.13	0.3	0.37
17	Punjab	5	4	4	1.02
18	Assam & Bodoland	2068	2766	3222	1859**
19	Ar.Pradesh	22	15	12	8*
20	Manipur	418	487	516	147*
22	Meghalaya	517	644	656	155*
23	Mizoram	40	44	50	30
24	Nagaland	324	606	619	218*
25	Sikkim	3	0.20	8	3*
26	Tripura	15	40	48	15*
Total		23,679	26,480	28,708	9590

(p): Provisional

*Refers to April to June-2015

**Refers to April to July-2015



Sericulture is an eco-friendly agro-based labor intensive and commercially attractive economic activity, falling under cottage and small-scale sector. Sericulture enterprise in its totality is a long chain industry from mulberry cultivation to fabric making. India stands second in silk production; next to China. Sericulture is the only cash crop, which provides frequent and attractive returns in the tropical states of the country through year. Sericulture Industry in India has classified the employment generation pattern of the industry into two major types:

Direct Employment

(a) Mulberry Cultivation; (b) Leaf Harvesting; (c) Silk Worm Rearing;

Indirect Employment

(a) Reeling; (b) Twisting; (c) Weaving; (d) Printing & Dyeing; (e) Finishing; (f) Silk Waste Processing.

The production of raw silk and silk fabrics are limited to only a few countries in the World of which China (1,03,620 MT; 81.95%) occupies the first place and India (19,690 MT; 15.44%), the second. India is the second largest producer of silk in the world next only to China. Karnataka is the leading sericulture state which contributes around 50 per cent of the total silk production in India. It is estimated that the indirect effect of sericulture to the farm income is about 25 per cent. Sericulture is practiced in about 52,360 villages all over the country and employment to about 7.56 million people, most of them being small and marginal farmers in rural areas, creating employment to at least for 12-13 people per hectare of mulberry. Raigarh district stand first in area under plantation of host plant for silkworm rearing. Raigarh district has total area of 2022.6 ha Daba tasar farming under with production of 15,93,7,216 lakh cocoons 63 6375 beneficiaries. In view of the importance of sericulture enterprise, the paper tries to enlighten and discuss the significance of sericulture and strategies to be taken for the employment generation in Indian sericulture industry. Present paper explores the possible employment opportunities derived from problem analysis in the study area. The study concludes with some suggestions to improve the feasibility of sericulture in long term.

Visit to various sericulture centres

Educational Visits are a part and parcel of an Educational Institute. It gives them an opportunity to learn from their own experiences and from the experience of others. According to NCTE norms, students are required to visit to different departments such as Sericulture, Animal Husbandry, Dairy Farming, Horticulture etc. Such visits are organized for students on regular basis to give them exposure for the outer world. Students learnt a lot about

Sericulture or silk farming that is the cultivation of silkworms to produce silk. They came to know the complete life cycle of a Silkworm.

At CSRTI, Mysuru and its nested units of RSRS, RECs, many training programmes are being conducted as a part of Human Resource Development (HRD), mainly to impart training on the updated technologies to the sericulture farmers, officials, entrepreneurs, researchers, students, cocoon producers, chawki rearers etc. They will be imparted with training under different programmes like – TOP: Technology Orientation Programme, FST: Farmers' Skill Training, NBT: Need Based Training, IBT: Intensive Bivoltine Training. Apart from the above, overseas training is also conducted such as: ITEC – sponsored by Ministry of External Affairs (MEA) Govt. of India and JOCV – sponsored by Japan International Cooperation Agency (JICA).