

CENTRAL SILK BOARD

PROSPECTS IN SERICULTURE

1. India is now emerging as the second biggest silk producing country in the world, next only to China. However, India can become the leading silk producer because out of India's 360 million acres of net cultivated area, hardly half million is under mulberry, whereas China with about 2.5 million acres under mulberry out of a total cultivated area of 270 million acres, cannot go on increasing mulberry acreage.
2. Sericulture is highly labour intensive with 5 persons being employed for one acre of irrigated mulberry leading to cocoon production, reeling and weaving. It also transfers income from the richer sections to the farmers, reelers and weavers. Of the value of silk cloth, 55% goes to the farmers who produces cocoons, 15% to the reeler and twister, 12% to the weaver and about 18% to the trader. Sericulture also brings in a stream of income in 5 to 6 crops in a 12 month period. It has high export performance with an annual increase of 22% in India's silk exports during the past 3 years. Since Western countries do not produce silk, there is no unreasonable restrictions of silk imports in the West.
3. However, India should expand its research base if we have to breed the bivoltine races of silkworms which are native of the temperate countries like Japan, China and South Korea. Out of India's silk production hardly 2% is Bivoltine, the balance

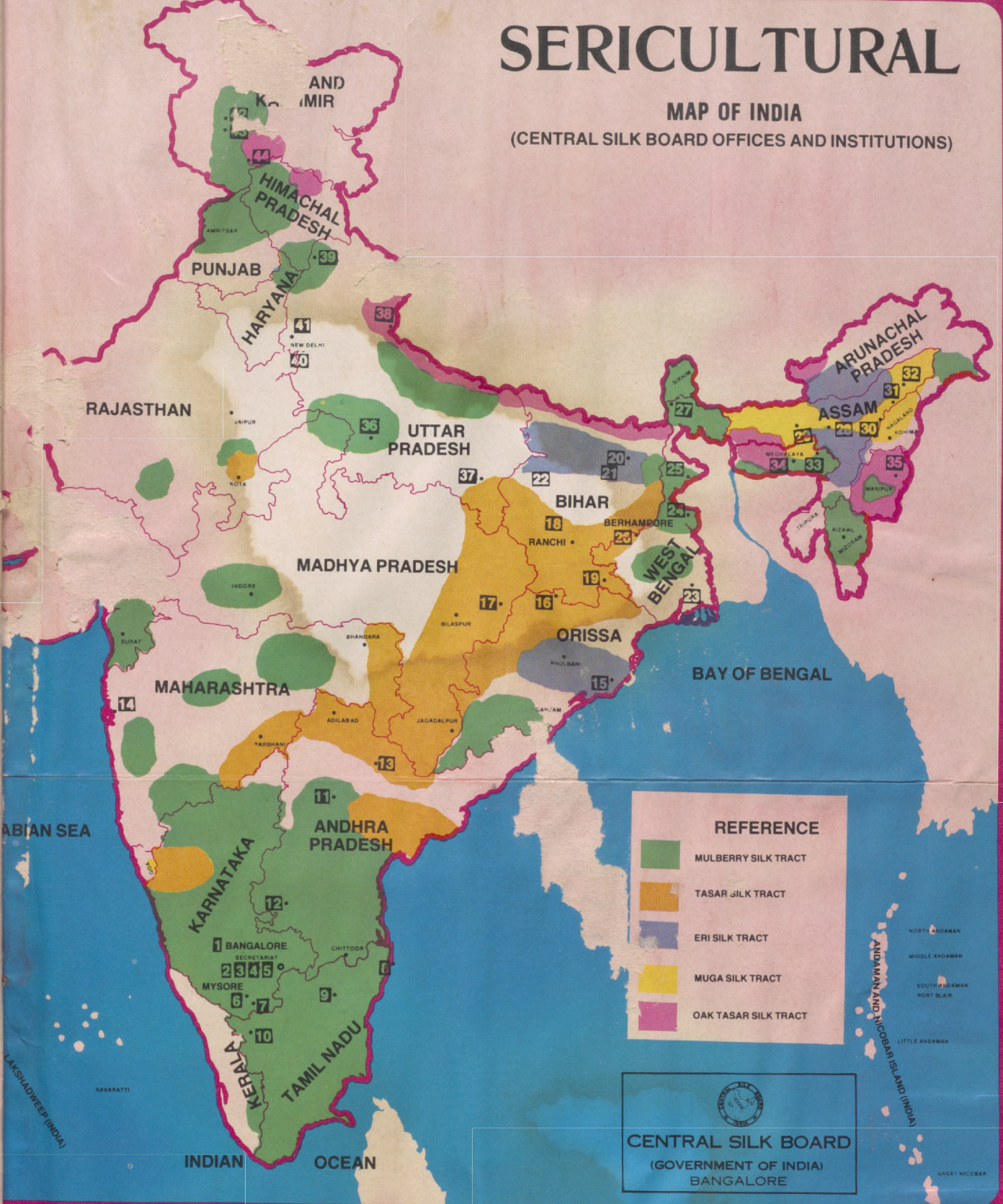
CENTRAL SILK BOARD  
( MINISTRY OF TEXTILES )

"A NOTE ON SERICULTURE"

'UNITED MANSIONS'  
II FLOOR,  
NO.39, M.G.ROAD,  
BANGALORE-560 001.

# SERICULTURAL

MAP OF INDIA  
(CENTRAL SILK BOARD OFFICES AND INSTITUTIONS)



## REFERENCE

<span style="color: green;">■</span>	MULBERRY SILK TRACT
<span style="color: orange;">■</span>	TASAR SILK TRACT
<span style="color: purple;">■</span>	ERI SILK TRACT
<span style="color: yellow;">■</span>	MUGA SILK TRACT
<span style="color: pink;">■</span>	OAK TASAR SILK TRACT

  
**CENTRAL SILK BOARD**  
 (GOVERNMENT OF INDIA)  
 BANGALORE

## PARTICULARS

- 1. Secretariat, Central Silk Board, Bangalore, Karnataka.
- 2. Regional Office & Certification Centre, Bangalore, Karnataka.
- 3. Central Silk Technological Research Institute, Bangalore.
- 4. National Silkworm Seed Project, Bangalore, Karnataka.
- 5. Regional Sericulturals Research Station (irrigated mulberry) Bangalore, Karnataka.
- 6. Central Sericulturals Research & Training Institute, International Centre for Training & Research Tropical Sericulture, Mysore, Karnataka.
- 7. Regional Sericulturals Research Station (rainfed mulberry), Kollegal, Karnataka.
- 8. Regional Development Office & Certification Centre, Madras, Tamil Nadu.
- 9. Regional Sericulturals Research Station, Salem, Tamil Nadu.
- 10. Regional Sericulturals Research Station, Coonoor, Tamil Nadu.
- 11. Regional Development Office, Hyderabad, Andhra Pradesh.
- 12. Regional Sericulturals Research Station, Anantapur, Andhra Pradesh.
- 13. Tasar Raw Material Bank, Sub-Depot, Vidyanyapur, Andhra Pradesh.
- 14. Regional Office & Certification Centre, Bombay, Maharashtra.
- 15. Regional Development Office, Bhubaneswar, Orissa.
- 16. Tasar Sub-Depot (RMB), Rourkela, Orissa.
- 17. Central Tasar Silkworm Seed Station, Lakha (Raigarh), Madhya Pradesh.
- 18. Central Tasar Research & Training Institute, Regional Sericulturals Research Station (Mulberry) Ranchi, Bihar.
- 19. Raw Material Bank, Sibsagar, Assam.
- 20. Certification Centre, Tasar Sub-Station, Bhagalpur, Bihar.
- 21. Regional Research Station, Bhagalpur, Bihar.
- 22. Regional Development Office, Patna, Bihar.
- 23. Regional Office & Certification Centre, Calcutta, West Bengal.
- 24. Central Sericulturals Research & Training Institute, Berhampore, West Bengal.
- 25. Regional Development Office, Malda, West Bengal.
- 26. Regional Sericulturals Research Station, Kashipur, West Bengal.
- 27. Regional Sericulturals Research Station, Kalimpong, West Bengal.
- 28. Regional Development Office, Gauhati, Assam.
- 29. Regional Muga Research Station, Mirza, Assam.
- 30. Regional Sericulturals Research Station, Titabar, Assam.
- 31. Muga Raw Material Bank, Sibsagar, Assam.
- 32. Muga Raw Material Bank, Sub-Depot, Dhakuakhana, Assam.
- 33. Muga Seed Development Project, Tura, West Garo Hills, Meghalaya.
- 34. Eri Regional Research Station, Mendipethur, Meghalaya (Proposed).
- 35. Regional Tasar Research Station, Imphal, Manipur.
- 36. Regional Development Office, Dehradun, Uttar Pradesh.
- 37. Certification Centre, Varanasi, Uttar Pradesh.
- 38. Regional Tasar Research Station, Bhimtal, Uttar Pradesh.
- 39. Univoltine Research Sub-Station, Majra, Uttar Pradesh.
- 40. Regional Office & Certification Centre, New Delhi.
- 41. Inter State Tasar Development Project & International Centre for Training and Research in Tropical Sericulture, New Delhi.
- 42. Regional Office, Certification Centre & Central Silk Conditioning & Testing House, Srinagar, Jammu & Kashmir.
- 43. Regional Sericulturals Research Station, Pampore (Jammu & Kashmir).
- 44. Regional Tasar Research Station, Batote, Jammu & Kashmir.

1.3 The European interest also gets affected because of the falling production in Japan and increasing domestic consumption by China. The traditionally silk producing countries of Europe viz. Italy and France are no longer producing any cocoons and are entirely dependent upon imported silk yarn for running their silk industry. China has been consistently supplying good quality silk yarn to the main European silk fabric manufacturing countries, viz. Italy, France, Switzerland, Germany and U.K. at very reasonable rates and the required quantity. It will be interesting to know as to whom China will choose to favour between Japan and European countries when it has limited supplies to export. The ISA's prediction is that due to the increasing dependence of China on Japan for the development of its oil, steel and other industries, China will continue to supply silk to Japan even if Europe is starved.

1.4 It is in this background of future forecast that ISA looks to Brazil and India for increased silk supplies. Brazil's production in fact has been steadily going up from about 187 tonnes in 1968 to nearly 1554 tonnes in 1985. However, Brazil has a limitation namely, its sericulture is entirely managed by the expatriate Japanese or people of Japanese origin. The vast plains of Eastern Brazil where living conditions are poor are not taking to sericulture due to the climatic adversities and labour intensive nature of sericulture. The gap could however be met by India, if only it adopts a wise policy of production of bivoltine raw silk of international grade.

#### Advantages of Sericulture

2.0 Sericulture is an agro based cottage industry that generates massive employment, specially in the rural areas. It consists of four distinct activities namely (a) Mulberry cultivation, (b) Silkworm Rearing, (c) Silk Reeling and (d) Silk Weaving. The first two activities are agriculture in nature and the latter two are predominantly in the cottage industrial sector. Sericulture has the following advantages:

### Sericulture as a high employment oriented industry

2.1 An acre of mulberry will provide gainful employment to 5 persons all the year around in cultivation and maintenance of mulberry, silkworm rearing and production of reeling cocoons. In the Industrial sector reeling/spinning, weaving, printing, finishing and processing of silk fabrics, the industry provides employment to a large number of people in rural and semi-urban areas. This apart, the industry will provide employment indirectly in other ancillary units like manufacture of sericulture equipments, appliances, marketing of sericulture products, etc.

2.2 In the non-mulberry sector covering production of tropical tasar, oak tasar, eri and muga the industry mostly employs tribals who take up rearing of these non-mulberry silkworms on nature grown forest plantations. Many of the landless labourers also could gain employment in silkworm rearing and silk reeling/weaving etc. Thus, sericulture fulfills the national objectives of providing employment opportunities to tribals and villagers and prevents migration from villages to towns and cities. It also fulfills the objectives of the 20 Point Programme.

### Sericulture is for small and marginal farmers.

2.3 Sericulture is normally practised by small and marginal farmers to obtain comparatively higher incomes. Experience also shows that income from sericulture is comparatively higher, if practised in smaller units. Rearing of non-mulberry silkworms like tasar, eri and muga on nature grown food plants is practised by the tribals inhabiting the forest areas. Sericulture involves very simple technologies easy for adoption by even illiterate people. Ladies and children attend to rearing of silkworms and production of cocoons. Labour requirement is spread over the year and family labour could be effectively engaged.

Sericulture involves lower rate of investment but gives higher income.

2.4 Sericulture has low investment and high output ratio. A farmer with one acre of mulberry can easily get an income of Rs.8,000/- under irrigated conditions and Rs.3,000/- under rainfed conditions, which no other commercial crop would yield. The investment in sericulture also is very low. Apart from cultivation of mulberry and small investment in maintenance of mulberry plantation, purchase of cheap rearing appliances/equipment and cost of silkworm seed, it does not involve any major investment.

2.5 In the rearing of tasar, eri and muga, the investment has been very little. The rearer has only to pay for silkworm seed and rear the silkworms for around one month on nature grown plantations and keep a watch to protect them from pests and predators to get an income of Rs.1500 to 2000 depending on the quantity of seed reared. With the rearing of more quantity of silkworm seed, the income could be still higher.

Sericulture requires low gestation period.

2.6 Sericulture requires very low gestation and it starts yielding very quickly. From the 5th or 6th month of raising mulberry plantation, the farmers can start rearing silkworms and earn income. It has another advantage of giving returns in quick succession which no other crop would yield. The farmer can take up silkworm rearing every 2 to 2 1/2 months from the same plantation and get returns in quick succession. Any losses due to a reduced or failed crop can also be recovered with in 2-3 months by better results in the subsequent rearing.

Sustaining capacity of mulberry in drought conditions.

2.7 Mulberry, the food plant of silkworm, is a deep rooting plant and it withstands drought conditions. During severe droughts when all other crops wither, it is only from mulberry that the farmer could still rear some quantity of silkworms and get incomes for his sustenance and tide over the famine conditions. In spite of the severe drought currently affecting Karnataka, Andhra Pradesh and Tamil Nadu silk production increased by 8% in the states during 1985-86.

Sericulture as a means of income-levelling.

2.8 Sericulture plays a vital role in transferring wealth from richer sections of the society to the poorer sections. Silk is consumed mostly by the affluent and the money so spent by them on purchase of silk is distributed among the farmers, reelers, twistors, weavers and traders. The major share of which goes to the farmers who rear silkworms and produce cocoons. The percentage of distribution of money from silk fabrics will be as follows:-

1. Cocoon Producer	54.6%
2. Silk reelers	6.6%
3. Twister	8.7%
4. Weaver	12.3%
5. Trader	17.8%
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	100.0%

Need to increase silk production to meet growing demand.

2.9 The demand for silk fabrics has been increasing both within the country and abroad. Traditionally, Indian women have an affinity for silk fabrics and silk sarees. With the improvement in standard of living, the demand for silk fabrics also is on the increase. While a small percentage of silk produced in India is being exported, major production is being consumed internally. Added to it, India is also importing raw silk from other silk producing countries like China and South Korea to meet its internal demand as also to produce exportable fabrics. It is, therefore, essential that the sericulture industry is developed in all the potential areas not only to increase our production but also to provide gainful employment to the rural populace.

Opportunities for India to increase its production and gain second position among silk producing countries.

2.10 Among the silk producing countries, China occupies the first position. The production in Japan which was the major producer of raw silk in the world, has been declining steeply year after year because of large-scale industrialisation and dearth of labour.

Japan has now been importing raw silk from other countries to meet its internal demand. The raw silk production in South Korea which had suddenly increased in mid '70s, is now declining. Therefore, India which presently occupies 3rd position among the silk producing countries can advantageously increase its production to gain recognition as the second major raw silk producing country in the world after China. India has another advantage of producing all the four commercially known varieties of silk and by increasing the production of all four varieties substantially, it can capture the world silk market in a big way.

Sericulture is a foreign exchange earning industry.

2.11 There has been a steady rise in the export of Indian silk fabrics to international market. The export earnings from sericulture during 1984-85 had been Rs.129.06 crore and during 1985-86 it increased to Rs.160.00 crores. With the withdrawal of Japan from the world silk market, India has the advantage of boosting its silk exports and capture the world market by improving the quality of its silks. India has to compete only with China in the world silk market. As silk constitutes only 0.2% of the total production of all natural and man made fibres, it remains a luxury and its price is steadily increasing in the international market. The table below indicates the trends in Indian silk export.

Year	Fabrics Quantity (lakh sq. metres)	Total value (Rupees in lakhs)
1968-69	40.78	682.94
1974-75	50.75	1265.81
1979-80	107.68	4883.17
1980-81	125.82	5312.05
1981-82	142.99	6973.21
1982-83	140.90	8284.84
1983-84	147.75	11167.26
1984-85	170.70	12905.14
1985-86	194.15	15981.81

Utilisation of unarable wastelands for sericulture development.

2.12 Mulberry and other non-mulberry food plants tolerates a wide range of soil conditions and could be cultivated on non-arable and barren wastelands to carry out silkworm rearing. Silkworm food plants like Mulberry, Terminalia Arjuna, Terminalia Tomentosa, Som, Soalu and Castor can easily be cultivated in non-arable barren wastelands and in forest areas for silkworm rearing. The Social Forestry Programme, the National Afforestation Programme and the programmes of Wasteland Development Board etc. can include cultivation of silkworm food plants for providing employment opportunities to the villagers and tribal inhabitants of the area.

3.0 Central Sericulture Project

3.1 The vast potential that exists in India for producing 4 to 5 times of silk than it produces now can be achieved only if we primarily strengthen the research organisation and methods, provide good quality silkworm eggs and introduce quality control methods. The Planning Commission, constituted a Committee under the Chairmanship of Additional Secretary (Textiles), to review the progress of sericulture in the country and to suggest steps and strategies for further improvement and expansion of the same during 7th Plan. Among others, the sub-group has reviewed in detail the progress achieved in mulberry raw silk production in each State and observed that the main bottleneck for improving and expansion of sericulture is the non-availability of good quality silkworm seed, suitable silkworm and mulberry strains, insufficient advisory services, marketing, improved reeling and lack of quality consciousness at various stages of silk production. It was also observed that the above factors have contributed for the slow implementation of the bivoltine programme and suggested suitable steps to implement the above programmes during the 7th Plan period to achieve the desired objective. Accordingly, the Central Silk Board has prepared a project "Central Sericulture Project" to be implemented with the financial assistance from World Bank.

3.2 The Project would cover 74,670 ha. of the estimated 3,30,000 ha. mulberry plantation in the country. It has four major objectives:

(i) to increase raw silk production by about 4,900 m.tons of which 3,900 tons would be superior grade bivoltine raw silk, by providing good quality silkworm eggs, young silkworm rearing facility (chawki rearing centres) extension support to the sericulturists already cultivating mulberry in the traditional States and to those who are projected to plant in new areas. Emphasis has been laid to cover additional area in new States as it offers greater opportunity for increasing bivoltine raw silk. The break-up of target area and production in traditional and non-traditional States is detailed in the table below:-

	South- ern States	Jammu & Kashmir	Other States	Total Mulberry Area	Raw silk Production (m.t.)
<u>Existing Plantation (ha)</u>					
Rainfed (5 crops)	6,720	-	-	6,720	40**
Irrigated (5 crops)	15,120	-	-	15,120	490**
<u>New Plantation(ha)</u>					
Irrigated (5 crops)	13,740	-	-	13,740	1,590
Rainfed(2 crops)	-	4,800	-	4,800	260
Rainfed/ irrigated(4 crops)	-	-	34,290	34,290	2,530
TOTAL	35,580	4,800	34,290	76,670	4,910

\*\* incremental production

(ii) to introduce new silkworm varieties, better reeling machineries and quality control facilities, which would upgrade Indian raw silk to export quality.

(iii) to provide basic facilities viz. good quality seed supply, marketing, reeling and extension support, to new States where such facilities are lacking at present.

(iv) to expand research and to introduce latest technology with research and technical assistance from leading silk producing countries.

3.3 For achieving these objectives, the project includes components for production of good quality silkworm eggs, chawki rearing and advisory services; marketing and quality control; research, overseas technical assistance and training. It would also provide credit to seed cocoon growers and reelers through NABARD.

3.4 The details of Project <sup>cost</sup> is summarised in the table below:-

**PROJECT COST SUMMARY**  
(Rs. Crores)

1.	ON FARM CREDIT	
	Composite Loan	10.72
2.	CREDIT FOR REELING	
	Multiend Reeling basins	11.20
	Sub-total	<u>21.92</u>
3.	RESEARCH AND TRAINING	
	Germplasm station	2.91
	Strengthening of Silkworm Labs.	1.60
	Silkworm Seed Technology Lab.	4.26
	Sub-total	<u>8.77</u>
4.	SILKWORM SEED PRODUCTION AND EXTENSION	
	Basic Seed Farms	27.23
	Grainages	53.74
	Technical Service Centres	14.57
	Chawki Rearing Centres	58.98
	Sub-total	<u>154.52</u>
5.	COCOON MARKETS	3.49
6.	QUALITY CONTROL UNITS	
	Cocoon Testing & Grading Units	2.65
	Silk Conditioning & Testing Houses	8.38
	Sub-total	<u>11.03</u>

7.	TECHNICAL ASSISTANCE	
	Consultancy	1.30
	Study Tour	<u>1.98</u>
	Sub-total	<u>3.28</u>
8.	PROJECT ADMINISTRATION	1.41
9.	PROJECT EVALUATION	0.20
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A.	BASE COSTS	204.62
B.	PHYSICAL CONTINGENCY	12.03
C.	PRICE CONTINGENCY	<u>45.28</u>
	PROJECT COST	<u>262.93</u>

#### PROJECT BENEFITS

3.5 The project would provide a sound footing to the Indian silk industry by creating the required infrastructure and introducing latest technologies and modern facilities at all stages of silk production. It would assist the country in increasing raw silk production from 6895 to 11800 M.tons besides improving the quality and yield from improved silkworm varieties and practices. The project would also help to upgrade the raw silk by introducing testing facilities. Importantly, the project would stabilise cocoon crop and help to introduce productive silkworm breeds. There would be large scale introduction of bivoltine silkworm varieties with higher cocoon yield, better silk content and better quality than local varieties which would substantially improve the quality of yarn. To support long term growth of the industry, the project would seek to enhance research and provide consultancy and training from advanced sericultural countries to broaden and intensify the Indian research.

3.6 The project benefits would include net incremental cocoon production of 44,500 m.tons annually at full development resulting in an annual incremental raw silk and silk waste production of 4,900 m.t. and 985 m.t. respectively, valued at Rs.300 crores, of which 3,900 tons would be of superior grade bivoltine raw silk.

3.7 The incremental expansion of mulberry would be adopted by about 2,74,000 farm families, generating employment opportunities an estimated 6,90,000 work years annually. Almost all wage earners, from field labourers to those involved in traditional reeling and handloom weaving would be from the low income group. In addition, about 40,600 work-years of primarily unskilled labour would be engaged in construction of supporting infrastructure under the project, approximately 12,700 number of semiskilled and unskilled labour and 2,320 technical and scientific staff would be employed to operate supporting infrastructure.

3.8 A farm family by taking to sericulture from traditional crops would earn an estimated annual incremental income of Rs.5766 per acre compared to Rs.3112 estimated net income before conversion. The families which adopt improved varieties and practices would get an estimated incremental income per acre of Rs.8074, Rs.2141, Rs.2775 in the States in South, Jammu & Kashmir and other States respectively. The income generation varies between States as there is limitation to the number of crop cycles due to climate. An added attraction to sericulture is that the short crop cycle provides continuous cash flow, and any losses due to a reduced or failed crop can be recovered within 2-3 months by better results in the subsequent rearing.



**Philippine Jesuit Aid Association  
Perpetual Membership**

MRS. S. THANGAM  
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will share perpetually, as a pledge of our gratitude, in three holy Masses daily, first intention, in three monthly Novenas of holy Masses, first intention, and will participate in the daily Masses, holy Communion, Rosaries, Prayers and Apostolic Labors of the Jesuits of the Philippine, New York and Maryland Provinces.

**Requiescat in pace**

*Adria J. Martinez, S.J.*  
**Director**

**Date** December 24, 1985

## GLOSSARY

Bivoltine	Silkworm varieties from temperate region which breed twice a year and whose eggs exhibit dormancy.
Charka	Simple, hand driven silk reeling machine with one basin and four to six ends.
Chawki	Rearing of young age silkworms (1st age to 3rd age) with utmost care. The word 'Chawki' is derived from Kannada (Karnataka) language.
Cocoon	A capsule formed by silkworm larva by expelling silk from its gland to protect itself during hibernation stage. It also metamorphoses as pupa inside the capsule.
Denier	Grams silk per 9000 m yarn of filament, used as measure of silk yarn or cocoon filament thickness.
Filament	Single silk thread of a cocoon.
Filature	Large scale silk reeling factory.
Germplasm	Hereditary material of the germ cells (genes) independent of other cells.
Grainage	A place where silkworm eggs are produced under scientific methods.
Hybrid	A product of female and male crossing belonging to different races.

Hatching	Eggs give birth to larvae.
Laying	Eggs laid by mother moth.
Multivoltine	Tropical silkworm races which breed throughout the year and whose eggs have no dormancy.
Multibivoltine	A cross between multivoltine race and bivoltine race.
P4/P3/P2	Great grand parents of silkworm races that are scientifically raised in these farms.
Raw silk	Silk yarn after reeling cocoons.
Reeling	Unwinding of the filament from the cocoon to form a continuous composite thread of several filaments for further processing of silk.
Renditta	Number of kilos of cocoons required to produce one kilo of raw silk.
Spun silk	Silk yarn prepared from silk waste by degumming, combing and spinning process.
Univoltine	Similar to bivoltine silkworm varieties, but breed only once during the year.

