

CHAPTER – 12

SERICULTURE AND SILK INDUSTRY

INTRODUCTION

12.1 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 is known as the queen of textiles the world over.

12.2 The Indian silk industry has seen many ups and downs. During the 18th, 19th and early 20th centuries sericulture flourished in the states of Bengal, Mysore and Kashmir. During the Second World War silk production was promoted for making parachutes. Planned efforts of the Government of India in the post-independence period gave a thrust as a tool for rural employment, poverty alleviation and export earnings which gave a big boost to the industry. At present, it is estimated that every hectare of mulberry provides employment to about 16 persons. Concerted research and development efforts and expansion brought the raw silk production from 1437 MT in 1951-56 to 17351 MT in 2001-02 though it remained almost static during X Plan. However, the productivity has gone up from 16 kg to 85 kg raw silk per ha / year.

12.3 China, producing 102,560 MT (81.65%) of raw silk is the largest exporter where as India, contributing about 13 percent of the world's raw silk production, is the largest consumer. The high quality and low price are the strengths of Chinese silk while the traditional practice of wearing silk clothing on all auspicious days has been the strength of the Indian silk in the domestic market and the exclusive designs in the international markets. Indian exports are largely dependent on the import of quality silk from China.

12.4 India has the distinction of being the only country producing all the four known commercial silks, namely, Mulberry, Tasar, Eri and Muga of which Muga with its golden yellow glitter is unique and restricted to the northeastern region of India.

12.5 The increasing labour costs resulted in phasing out the silk industry in the industrialised countries like France, Italy, Spain, Japan and Korea as the labour intensiveness has become uneconomical. The availability of huge human resources and other inputs at cheaper cost remained the biggest advantage to the silk industry in

China. Now with a similar transformation in China in the recent years, they have been shifting the sericulture activities away from the urban and industrialised areas where the human resources still remain cheap. India follows because of its huge human resources.

12.6 India too has seen a conspicuous decline in the area under mulberry between 1990-92 (3, 31,237 ha) and 2004-05 (1, 71,959 ha). Though the decline in the cultivated area and the raw silk production during 2002-2004 was largely attributed to drought and dumping of Chinese silk at cheap prices, the decline in the area under mulberry could be very well attributed to the lowering water table in the traditional silk producing areas, prompting them to switch over to horticulture crops, requiring the least quantity of water and urbanisation. This has been prominently visible in the traditional areas of Karnataka.

12.7 Though there has been a steep decline in the area under mulberry, this has been somewhat compensated by the productivity which has gone up to around 85 kg of raw silk per hectare per year due to introduction of highly productive mulberry and silkworm breeds. During the past two years, the raw silk production has picked up and touched 17,305 MT during 2005-06 (almost the same as that prevailing at the end of the IX Plan) and it is likely to cross 18,500 MT by the end of the X Plan. With many Business Process Outsourcing (BPO) and manufacturing units coming up in urban areas, the scope of developing sericulture largely remains with the rural areas off the urban habitation.

SILKS OF INDIA

12.8 As already mentioned, India has the distinction of being the only country in the world producing all the four commercially known silks, namely, Mulberry, Tasar (includes oak tasar), Eri and Muga.

Mulberry Silk:

12.9 Mulberry silk is the most popular and widely cultivated one produced by the insect, *Bombyx mori*, feeding exclusively on the leaves of mulberry (*Morus* spp). Depending on the number of generations it passes in a year they have been termed as univoltine (with one generation), bivoltine (two generations) and multivoltine (many generations). Univoltines and bivoltines are adapted to temperate regions matching with the availability of fodder, which depends on the growth and dormancy of the food plants resulting from the climatic changes. They are known to yield high quantities of high quality silk, but are sensitive to warmer temperature, excessive humidity and other environmental stress. Multivoltines are well adapted to tropical situations where mulberry grows and produces fodder throughout the year. These silkworm breeds are tolerant to higher temperature, humidity, diseases and other stresses, but are poor yielders. Bivoltine hybrids are reared largely in the temperate regions such as Jammu & Kashmir, Himachal Pradesh, Uttaranchal, a few pockets in the eastern/north-eastern region and to a limited extent in Karnataka, Andhra Pradesh and Tamil Nadu. Multivoltine reeling cocoons are produced exclusively in West Bengal and parts of Assam. About 95 percent the silk produced in the country is that of cross breed (multivoltine x bivoltine) including marginally multivoltine silk and the bivoltine silk is around 5 percent.

Tasar Silk:

12.10 Tasar silk is largely produced by the tropical insect, *Antheraea mylitta* and to a little extent by the temperate insect, *Antheraea proylei*. They feed on a wide range of species of food plants. The tropical tasar silkworms feed mainly on Asan (*Terminalia tomentosa*), Arjun (*T. arjuna*) and Sal (*Shorea robusta*). The temperate tasar is also known as oak tasar as the worms feed on many species of Oak (*Quercus* spp). Tasar silk is copperish and much stronger. Tropical tasar is produced in Jharkhand, Chattisgarh, Madhya Pradesh, Orissa and Bihar and to a small extent in Maharashtra, West Bengal and Andhra Pradesh. Oak tasar is cultivated in the sub-

Himalayan belt covering the States of Manipur, Himachal Pradesh, Uttar Pradesh, Assam, Meghalaya and Jammu & Kashmir.

12.11 Tasar silk is basically a forest produce and was practiced by adivasis and tribals from time immemorial in tropical belts even prior to introduction of mulberry silk in India. Migration to urban areas and deforestation has therefore an adverse affect on tasar silk production. Approximately 30 percent of the tasar silk was obtained from nature grown eco-races like Railey, Laria, Sarihan, Modal, etc. which are solely wild and not amenable to human handling. Over exploitation of these races and introduction of cultivated eco-races from other areas resulting in the neglect of these local races resulted in their dwindled production. 'Daba' is the most amenable eco-race largely cultivated in tropical India.

Eri Silk:

12.12 The very name 'Eri' is derived from the Sanskrit word, 'Eri' or 'Erandi' which means castor (*Ricinus communis*). It is also known as 'Endi' in Assam. It is cultivated on Kesseru (*Heteropanax fragrans*), Tapioca (*Manihot utilissima*) also known as Cassava, Payam (*Evodia fluxinifolia*), Barkesseru (*Ailanthus spp*), etc. It tops the non-mulberry silks in production. *Samia ricinii* (Referred to as *Philosamia ricinii* in earlier occasions) is the only cultivated eri silkworm in the world. It is a multi-voltine silkworm with 4 to 6 broods a year. The cocoons are non-reelable and therefore spun into yarn looking like cotton. Eri cocoons are comparable to the cut/pierced mulberry cocoon in terms of value and do not stand well in comparison to mulberry culture in terms of return from unit area in southern India. But, it has been an integral part of the culture of Assamese and many others in the north eastern states and a few pockets in the adjoining eastern states where the pupae are relished cuisine at par with other meats; and the silk which is as warm as wool is used in making warm clothing particularly in the form of chadders. Though a large number of people cultivate eri silkworms, it is in a very small scale, often between 25-50 disease free layings (dfls) on nature grown food plants. Systematic cultivation of annual food plants like castor or tapioca exclusively for cocoon production remains uneconomical. Bulk of eri silk is produced in Assam and to a small extant in Bihar, West Bengal, Orissa and Manipur. Central Silk Board initiated intensive efforts to introduce eri-culture in the non-traditional states where castor and tapioca are traditionally grown for oil seed and tubers on castor and tapioca as a subsistence activity utilising part

(25-30 percent) of the leaves by extending support for castor cultivation and start up tools.

Muga Silk:

12.13 Muga silk is obtained from the silk insect, *Antherea asama*, which looks similar to the tasar silk insects. It is multivoltine with 5 to 6 broods per annum and feeds on a wide range of species of food plants, important of which are Som (*Persea bombycina*) and Soalu (*Litsea polyantha*). Though the silkworms are grown outdoors on the trees, mature silkworms crawl down the trees when they are picked up and placed on dry twigs serving as mountages indoors. This is cultivated extensively and almost exclusively in Assam and a few north-eastern states. The cocoons are fawn coloured while the reeled silk is of golden yellow.

INDIA'S POSITION IN WORLD SILK PRODUCTION IN GLOBAL CONTEXT

12.14 The world raw silk production has shown a gradual increase from 80,989 Mt. to 125,605 Mt. from the year 1998 to 2004. This is mainly because of the increase in the raw silk production by China to 102560 mt (81.65 percent). India's production has almost been stagnating at around 16,500 mt (around 13.1 percent) while there has been a gradual decline in most other countries. Chinese silk is still the cheapest and perhaps, the contributing factors to the cost price much favourable in China unlike in India.

The world mulberry silk and raw silk production is given in **Appendix –12.1 & 12.2.**

IMPROVEMENT IN PRODUCTIVITY

12.15 During the past decade a few highly productive breeds have come to use in India. The mulberry variety, V1 for the irrigated gardens has been reported to yield about 65 MT of leaf per hectare per year (i.e., the world's highest) with the recommended inputs at the most ideal situation and the CSR series of bivoltine silkworm breeds, which can yield international grades of silk (2A to 4A) and high productivity with a renditta of 6 (around 6 kg cocoons yielding 1kg of raw silk). It is claimed that about 65 kg of bivoltine cocoons are produced from 100 disease free layings (dfls) of CSR breeds on an average, while the multi-bivoltine hybrids, which constitutes over 90 percent of the silk production in the southern region, yields around 55 kg per 100 dfls. The fodder consumption also varies 8-15 kg per dfl by different breeds and correspondingly the cocoon production. It is possible to produce 2A or 3A

grade silk from the CSR breeds using the improved reeling machinery coupled with improved package of practices. However, in the light of X Plan experience, it is to be seen that this increased productivity has been in limited areas and with those farmers who were either exposed to Government schemes or could adopt it otherwise. Consequently, this increased productivity has failed to make any significant difference in over all production. Cross breed production constitutes about 95 percent of the silk produced in India dominating the bivoltine silk production. Cross breed silk is very conveniently used on handlooms while bivoltine silk forms an essential requirement of power-looms at least for the warp and this is now being imported from China.

Table 12.1
Silk Production of India at a Glance:

Particulars	Unit	2001-02	X Plan Target	2002-03	2003-04	2004-05	2005-06 (P)
Mulberry							
Area	Lk. ha	2.32	2.00	1.94	1.85	1.72	1.79
Raw Silk							
Bivoltine	M.T.	840	6,700	685	609	893	971
Multivoltine	MT	15002	17450	13932	13361	13727	14474
Sub-Total:	MT	15842	24150	14617	13970	14620	15445
Non-mulberry							
Tasar Raw silk	MT	249	450	284	315	322	308
Eri Spun Silk	MT	1160	1700	1316	1352	1448	1442
Muga Raw silk	MT	100	150	102	105	110	110
Sub-Total		1509	2300	1702	1772	1880	1860
Total Raw silk	MT	17351	26450	16319	15742	16500	17305
Silk Waste							
Mulberry	MT	4655		4514	3764	3587	3707
Non-mulberry	MT	319		336	373	365	297
Total :	MT	4974	4850	1702	4137	3952	4002
Employment	Lk	55.00	60.03	56.00	56.50	58.00	59.50
Exports (Rs. crore)			3200.0	2294.1	2779.2	2879.6	3158.2

P: Provisional

SERICULTURE IN NATIONAL ECONOMY

12.16 Sericulture has been a labour-intensive agro-based industry with several activities like, food plant cultivation, silkworm rearing, silk reeling, twisting, degumming weaving, dyeing, printing and finishing and garment manufacturing. The industry is spread over several states. It has a long tradition in states such as Karnataka, Andhra Pradesh, Tamil Nadu, West Bengal and Jammu and Kashmir. It is at various stages of development in the non-traditional states such as Uttaranchal, Uttar Pradesh, Madhya Pradesh, Chattisgarh, Orissa, Bihar, north-eastern states, etc. The number of crops range from one to six in a year in different sectors and in different areas. Mulberry provides one crop in J&K and Uttaranchal, two in most other hill and temperate areas and 3 to 5 in rain-fed and irrigated areas in other states; and eri has a similar situation with 3-4 crops but only in rain-fed areas; tasar with 2-3 crops and muga with 5-6 (2-3 commercial) crops. Thus silk industry at production stage provided almost round the year employment in many areas. The processing part almost provides equal employment. With the present level of productivity every hectare of irrigated garden is estimated to provide full time employment to around 16 persons (5 – up to cocoon production, 9 – for reeling and 2 – for weaving) up to weaving and many more down the line. The activity from weaving, finishing, garment manufacturing, etc. has scope for huge value addition and exporting. In spite of a slump or stagnation in Indian silk production, the exports have been increasing year after year.

GROWTH RATE AND DEMAND FOR SILK

12.17 The growth rate of silk production in the country has been at around 8 percent per annum while the demand for silk has been approximately growing at 10 percent per annum. The demand for silk has been ordinarily arrived at by adding the imports to the domestic production and this is estimated to cross 33,500 MT by the end of the XI Plan.

12.18 The indigenous silk primarily caters to a strong and growing domestic market estimated to have an annual growth rate of 10 percent. The weaving sector is estimated to consume over 26,000 MT annually. There has been an increase in the number of power-looms, which need good quality yarn and the shortfall is made good through import of yarn, especially from China.

RESEARCH AND DEVELOPMENT

12.19 Sericulture in India is a sustainable farm-based economic enterprise positively favouring the rural poor in the unorganised sector because of its relatively low requirement of fixed capital, and higher returns on investment. Several socio-economic studies have affirmed that the benefit-cost ratio of sericulture is the highest among comparable agricultural cash crops in the country. It generates a steady stream of income (on average, a net income of up to Rs 45,000 annually in about 4 to 5 splits, from one acre of irrigated mulberry) for its practitioner. Currently, about 6 million persons are employed in the silk sector. Export of Indian silk products during 2005-06 was valued at US \$ 713.39 million, according to data supplied by DGCI&S.

STATE-WISE PROFILE OF THE INDUSTRY

Karnataka:

12.20 The silk industry has been in existence in Karnataka for over two centuries. All stages in the silk production process (silkworm egg production, rearing, reeling, throwing, wet processing and weaving) are well established in the state. The sudden increase in Mulberry area, cocoon production and raw silk production has put the state once again to acclaim. However the transaction of reeling cocoons has been varying over the years despite of maintaining its dominance. The state has enough reeling infrastructure to feed the cocoons for raw silk production.

12.21 It has a strong power-loom base. The majority of the units are in the 'small' category with 4 to 6 looms while there are a few units with about 60 to 80 looms. Handlooms are concentrated in Molakalmuru, Guledagudda, Illekall and Anekal, the power-looms are concentrated in Doddaballapur and Bangalore. Most handloom units have 1-2 looms. Most of the units in the private and unorganised sectors use the pit handloom (fly- and throw-shuttle). Some of the units use frame looms. Most of the looms are fitted with the Jacquard set-up. Karnataka has been a pioneering state in sericulture but because of its restrictive State Sericulture Laws, it could not take the proper benefits of the Central Schemes. The state needs to liberalize and remove the legal hurdles on the path of progressive development of sericulture in the state to withstand the onslaught of influx of Chinese silk.

Andhra Pradesh:

12.22 The state now produces at par with Karnataka. Mulberry sericulture is practised in the areas adjoining the Karnataka Plateau, especially in the districts of Anantapur and Chittoor. Andhra Pradesh has about 3510 Charkha (Basins), 183 Cottage Basins and 476 Multi-ends. In spite of appreciable progress during the X Plan, growth of sericulture in Andhra Pradesh has suffered from inadequate modern reeling units and also lack of market infrastructure. These two areas need special attention during the XI Plan. The state also produces Tasar silk. The tribals in Adilabad, Karimnagar, Warangal and Khammam districts cultivate Tasar.

12.23 The state has a strong traditional handloom-weaving sector. Silk sarees produced in Andhra Pradesh, especially in Pochampally and Dharmavaram, have made a mark in the Indian and export markets. For generations, weavers of Dharmavaram, Pochampally, Narayanpet, Gadwal, Proddatur, Rayadurg, Atmakur, Mudireddypalli and Peddyreddipalli have been producing sarees, which are known for their rich designs and texture. Some weaving clusters have also come up in Neerugattupalli in Chittoor district during the last five years. Since silk production in Andhra Pradesh is predominantly handloom based, there is a demand for filature for warp and *charkha* for weft. Wet processing technology in the State is unique to the type of weaving adopted. It varies from place to place. While Dharmavaram and Narayanpet require uniform dyeing, Pochampally has separate requirements because of its tie and dye technology. Wet processing is carried out in-house or in centralised dyeing units. In the Dharmavaram and Narayanpet belts, there are dyeing units which operate on a job work basis. In Pochampally, weavers dye their own yarn because of the tie and dye technology adopted. The ikat or tie and dye pattern requires that weavers print the design on the yarn, and tie and dye those portions where a specific colour is required, based on design requirements. Tasar weaving is concentrated mainly in the Mahbubnagar, Karimnagar and Adilabad districts.

Tamil Nadu:

12.24 Tamil Nadu is well known for its traditional silk sarees and *dhotis* woven on handlooms. The state has a commanding presence in the handloom sector. The other stages of silk production – twisting, reeling and rearing – are also present in the state. Tamil Nadu has 130 Charkha Basins, 862 Cottage Basins and 102 Multi-ends. The reported raw silk production is 739 MT against the existing capacity to produce 348

MT. Much of the activity is concentrated in the North and Northwestern parts of Tamil Nadu. In spite of appreciable progress during the X Plan, growth of sericulture in Tamil Nadu has suffered from inadequate modern reeling units and also lack of market infrastructure. These two areas need special attention during the XI Plan. More entrepreneurs are coming forward with requisitions for installation of Automatic Reeling Machines and with investments for Contract Farming.

12.25 Silk products, mainly sarees, woven on handlooms in Tamil Nadu are well known for their designs with motifs and *zari* work. The weaving sector is concentrated in Kancheepuram, Arni, Kumbakonam and Salem. There are silk handlooms in other places like Coimbatore, Madurai and Tirunelveli.

12.26 The handloom sector in Tamil Nadu has two different structural arrangements: (i) handloom weavers associated with master weavers, and (ii) handloom units associated with co-operatives. The master weaver set-up was the only structure prevalent earlier. The State Government encouraged the formation of weaver co-operative societies to prevent the exploitation of handloom weavers. Most of the units use pit looms (fly-shuttle and throw-shuttle). Some master weavers employ frame looms depending on the availability of space. Most of the looms are fitted with the jacquard set-up, which costs about Rs. 6,000. Weavers in Kancheepuram and Kumbakonam mainly use bamboo reeds whereas weavers in the Salem and Coimbatore regions use steel reeds. On an average, handlooms in Tamil Nadu consume about 25 kg of silk per year. The estimated annual requirement of silk in Tamil Nadu is about 1,500 MT per year. The handlooms mainly use *charaka* silk for weft (26/28 denier) and *charaka*/filature for warp (20/22 denier). However, depending on the centre and the product manufactured, the type of silk used varies. There is a large consumption of *zari* in Tamil Nadu weaving centres. The *zari* is not produced locally. The weaving sector in Tamil Nadu is exclusive and the co-operative set-up is said to be reasonably successful as compared to other states. Silk reeling has not developed significantly in Tamil Nadu. Reeling is mostly done on cottage basins and *charkas*.

West Bengal:

12.27 West Bengal is one of the traditional mulberry silk producing states. The complete shifting from the Local Nistari to high yielding Cross-Breed rearing over a decade in the state of West Bengal is a significant achievement in the Sericulture history. To sustain the change, the fast increase in the mulberry area with high

yielding varieties, cocoon production and corresponding raw silk production justifies the purpose.

12.28 It ranks third in respect of the quantity of mulberry silk produced. Malda and Murshidabad and Birbhum are the predominant sericultural districts. While the bulk of the rearing and reeling activity is done in Malda, weaving is concentrated in Murshidabad. The main draw back is the difficulty in rearing breeds yielding high quality silk and dependency on Nistari race. Tasar is also produced in small quantities in the state. Reeling is mostly on Italian type reeling units. Tasar weaving is done mainly in Bishnupur. Other silk products include scarves, stoles, ties and products made out of *matka*, *ghicha* and spun silk. There are no significant wet processing facilities near the weaving enclaves. Screen and block printing of fabric is mainly concentrated in the Hooghly district, particularly Sreerampore near Calcutta. Special emphasis need to be given on the production of suitable races for the state so that it becomes self-sufficient in seed production.

Jammu & Kashmir:

12.29 Silk industry in Jammu & Kashmir is long-standing. Being one of the traditional silk producing states, sericulture was a major industry here even before independence, with silk being exported for parachute manufacture. But the rearing activity is seasonal (one crop a year) and on the trees from public places. There are many silk carpet-making units in Srinagar. The government-weaving factory (part of Jammu & Kashmir Industries) buys silk from its own filature in Srinagar, as well as from private weavers. Many private reeling units (all multi-end) are operated in the Jammu suburbs in addition to a few in Udhampur (about 10 basins). There are no *charaka*/cottage basin units in Jammu & Kashmir.

Bihar and Jharkhand:

12.30 Traditionally, Bihar and Jharkhand have been tasar producing states. Tasar culture is practised in 31 districts of these states. These locations adjoin the tasar belts of Madhya Pradesh and Orissa. Some of the important centres are Singhbhum (East and West), Bhagalpur, Santhal Pargana, Giridih and Ranchi. Castor is cultivated on the banks of the Ganges and other rivers. People growing castor found ericulture to be a natural extension of their activities to generate some additional income. Patna, Begusarai, Bhagalpur Purnia and Katihar are the main eri rearing districts. Bhagalpur is the main silk weaving centre. Other silk weaving centres are Godda, W.

Singhbhum, Nawada and Dumka. Silk weaving is done mainly using handlooms. The looms are pit looms made of wood or bamboo. Some of these looms have dobbies, while most are plain. Framelooms are seen only at the Weavers Service Centre and some units under DOS. The different types of yarn combinations used for weaving are as follows: *Matka* x *noil*, *noil* x *noil*, *spun* x *spun*, *spun* x *noil*, *noil* x *katia*, mulberry x dupion, tasar x tasar, tasar x *noil*, tasar x *spun*, *matka* x *ghicha* etc. *Jhuri*, *balkal* and jute are also used in combination to produce furnishings and fabrics according to demand.

Kerala:

12.31 Silk weaving is relatively new to the state. Bivoltines are reared for seed production in some parts of Idukki district (Maraiyur).

Madhya Pradesh and Chattisgarh:

12.32 Madhya Pradesh and Chattisgarh have traditionally been known for the production of tasar cocoons and tasar fabric. The tasar fabric is popularly known as Kosa. Besides the reared variety of tasar cocoons, Chattisgarh also produces nature grown cocoons (Railey cocoons) in the sal forests of Bastar District. Tasar rearing is done in the districts of Raigarh, Bilaspur and Raipur. Mulberry sericulture has been a comparatively recent introduction and still continues to be a non-traditional activity. However, the agro climatic conditions are stated to be suitable for mulberry sericulture and it is therefore being promoted in 42 out of the 45 districts in the two states.

12.33 The weaving sector is dominated by handlooms. Tasar weaving is concentrated around Bilaspur, Champa, Raigarh and Chandrapur. Mulberry silk is used mostly by weavers around Chanderi and Maheshwar. The weaving sector is entirely in the private and unorganised sector. Most handloom units are small with about 1-2 looms. The looms in use are pit looms and average production is very low at around 2.5 mtr. To 0.5 mtr. Per day. Chanderi is popular for the thin variety of sarees which requires mulberry silk of 14-16 denier. Tasar weavers use imported China tasar silk for warp and local tasar yarn for weft. In most cases, the weavers

themselves do the dyeing in their houses. There are small wet processing units in weaving pockets of Champa, Raigarh and Bilaspur.

Orissa:

12.34 The state has a strong tradition in weaving (mainly cotton), the main product being tie and dye sarees. Orissa produces tasar, mulberry and eri silk. Sonpur, Baragarh (Baragarh, Barapalli and Atabira) and Athagarh (Nuapatna) are the major silk weaving enclaves. Other important centres are Boudh, Balasore and Berhampur. There are no power-looms. Weaver families usually have 1 or 2 looms. Weavers operate independently or as part of weavers co-operatives which are organised under an apex society, the Orissa State Tasar and Silk Co-operative Society (OSTSCS). Independent weavers dye the yarn in their houses. The weavers' co-operative societies have dyeing facilities. Small quantities of yarn are dyed in open vats, mainly using acid dyes. Units under the co-operative societies mainly do mulberry reeling, although there are some private reeling units. The OSTSCS purchases cocoons from the rearers' societies and supplies them to these reeling units. Tasar culture is a traditional occupation of tribal people, who utilise about 2 million hectares of nature grown *arjun* and *asan* patches, which account for nearly 30 percent of the total forest land in the state. Daba is the main commercial crop. Nature grown Modal / bogai cocoons are also available.

Uttar Pradesh:

12.35 Climatic conditions in the districts of Gorakhpur, Deoria, Basti, Gonda, Bahraich, Pilibhit and Lakhimpur are favourable for the development of Cross Breed cocoons.

12.36 Tropical tasar rearing is practised on a limited scale by the tribals of Sonbhadra, Varanasi, Fatehpur and Sultanpur districts. The contribution of tasar silk to the total output of silk is negligible. Uttar Pradesh developed a number of mulberry farms in a big way during IX Plan. The state needs to take up sericulture seriously and come forward to make best utilisation of its sericulture farms in the state sector. Central assistance can be provided for such schemes.

12.37 Silk weaving is concentrated in Varanasi, Mubarakpur, Khairabad, Bhadoi and Mughal Sarai. In Varanasi and Mubarakpur, saree weaving is done predominantly on handlooms. There is, however, a difference in the composition and

quality of cloth from these two centres. Silk powerlooms are located mainly in Khairabad. Some powerlooms are operating in Varanasi and Mubarakpur also. Bhadoi is the carpet weaving centre.

12.38 Yarn degumming, bleaching and dyeing is mostly done by the weavers in their homes. Dyes are available locally and also in small quantities. Different shades are prepared by the dye seller by mixing colours. There are a few fabric dyeing and printing units at Varanasi. The discharge technique is used for screen printing. Block printing is also done in Varanasi.

Uttaranchal:

12.39 Climatic conditions in the district Nainital are favourable for the development of Multivoltine and Cross Breed cocoons. The Garhwal and Kumaoun areas of the hill region are suitable for Bivoltine rearing. Temperate tasar is practised in Nainital, Pithoragarh, Almora, Chamoli, Pauri, Uttar Kasi and Tehri. The contribution of tasar silk to the total output of silk is not significant.

12.40 There is no tradition of silk weaving in Uttaranchal. Of late, a few NGOs like A.T. India and Avani started weaving in a small scale.

Rajasthan:

12.41 The Government of Rajasthan discontinued sericulture activity since June 1996.

Maharashtra:

12.42 The silk industry in Maharashtra makes its presence felt through handloom weaving and dye manufacturing. Major weaving centres in Maharashtra are Yavala, Paithan and Bhandara. Almost all of them are handloom units. Paithan sarees are said to be the heaviest of all sarees in India. Wet processing is done at Yavala, and Nasik. There are more than 1000 tasar weavers in Bhandara. Sarees and shirting material are the main products. The weavers generally produce raw fabric and sell it to the traders. Processing is done at Vorti under the Development Corporation of Vidarbha Limited (DCVL). Reeling infrastructure for mulberry is very limited. Major centres for mulberry and Tasar rearing are Bhandara, Chandrapur, and Gadchiroli in Nagpur

region. There is tremendous potential in Maharashtra and strong cooperative tradition, which need to be explored.

Gujarat:

12.43 Sericulture was practised in the districts of Surat, Valsad, Bharuch, Banda, Mehsana, Dang, Kheda, Panchmahal and Ahmedabad. The prominent activity related to silk production in Gujarat is *zari* making. Other activities are done on a very small scale. Gujarat State discontinued Sericulture activity from July, 2002 onwards.

Himachal Pradesh:

12.44 Himachal Pradesh is the only state producing univoltine mulberry cocoons in addition to bivoltine cocoons. Oak tasar was introduced in 1983 in the districts of Mandi, Kengre, Shimla and Solan on a small scale and later extended to other potential areas. Silk weaving in the state is in the nascent stage. The reeling infrastructure is also very limited. Mulberry plants are raised under rainfed conditions in bush/tree form around farmers' houses, canal bunds, roadsides and land belonging to the forest department. The State has good potential for development of Oak Tasar silk with abundance of oak flora at various altitudes.

Assam:

12.45 Production of Muga raw silk is localized in Assam. The State is also a major producer of Eri silk. The muga raw silk production has seen a lot of ups and downs. Eri silk production has been on a gradual increase. There is a culture of rearing, reeling and weaving in small quantities at almost every house.

Meghalaya:

12.46 The climate suits for rearing of all the silkworm varieties. But the terrain is the limitation.

Manipur:

12.47 Manipur has very good scope for development of oak tasar, muga, mulberry and eri silk industries.

Mizoram:

12.48 Mizoram holds potential for development of all four varieties of silk.

Arunachal Pradesh:

12.49 A vast natural oak flora tract comprising oak species like *Quercus serrata*, *Q. semicarpifolia*, *Q. incana*, *Q. himalayana* etc. is available in the sub-Himalayan belt of the state. In addition, there is appreciable area under Muga and Eri food plants.

Nagaland:

12.50 The State has the tradition of culturing all four varieties of silk and has good potential for development and expansion of Eri, Muga and Oak Tasar sectors.

AMENDMENT TO CENTRAL SILK BOARD ACT:

12.51 The Parliament of India recently passed an amendment in the Central Silk Board Act making a provision to bring a regulatory mechanism for production and sale of silkworm seed in the country. This ensures i) production and sale of seed of authorized races only; ii) control on unauthorized production and trade; iii) Control and prevention of entry of untried and untested hybrids from other countries likely to be carrying diseases and other unknown risks. This enhances quality of seed and protects the interests of farmers by safeguarding against sudden crop losses and low productivity due to unidentified and un-guaranteed seed. Efforts would be made to expedite the formation and implementation of suitable Rules for the speedy development of Sericulture Sector.

PERFORMANCE OF THE SEGMENT DURING THE X PLAN

Financial Progress

12.52 The Government of India approved an allocation of Rs. 1164.16 crore for development of sericulture under the state and central sector programmes during the X Plan (2002-2007) against which expenditure incurred up to the end of 2005-06 has been Rs. 862.35 crore as per the break up given in the Table below:

Table 12.2
Financial Progress up to end of 2005-06

(Rupees crore)

Sl.No.	Sector	Outlay Approved	Expenditure Incurred (2002-2006)
1	State Plan Programmes	637.17	453.07
2	Central Sector Programmes*	526.99	409.28
	Total	1164.16	862.35

*Includes allocation of Rs. 76.99 crore approved by Government of India during March 2006.

12.53 The financial progress in respect of states is also given in the **Appendix – 12.3**

Physical Targets:

12.54 During the X Plan period, the thrust was on the Quality and Productivity in Indian Silk Industry. Out of a total production target of 26,450 MT of raw silk per year achievement could reach 17,305 MT by 2005-06 and expected to reach 18,653 MT by the end of the X Plan period. The shortfall is due to shortfall in Mulberry Bivoltine Raw Silk Production, in spite of the fact that this was the prime focal area of the X plan with substantial financial support. However, achievement is very close to the target of non-mulberry silk production of 2,300 MT of which 1,860 MT could be achieved by the end of 2005-06. By the end of the X Plan Period it is expected to reach 1953 MT.

Employment generation:

12.55 It was envisaged that 60.03 lakh persons will be employed in the silk industry. By the year 2005-06, the employment has touched 59.50 lakhs and is expected to reach 60 lakhs by the end of X Plan.

Exports:

12.56 During the X Plan, a target of Rs. 3200 crore was fixed, so far the exports have reached Rs. 3158.16 crore at the end of 2005-06 and it is expected to reach the target by the end of X Plan period. However the contribution to this seems to be from the specialized items like upholstery, furnishing material and specialized vanya silk products and a little from the indigenous bivoltine silk. The contribution of Central

assistance and Central Schemes being implemented by CSB in the export growth however has been only marginal.

Sericulture schemes implemented during X Plan:

12.57 During the X Plan 30 schemes commonly called, 'Catalytic Development Schemes' were sanctioned at an outlay of Rs. 180.98 crore and as per the mid-term appraisal an additional 17 components under EFC/CCEA particularly for improvement of Bivoltine silk production were approved by GOI at a total cost of Rs. 76.99 crore of which a sum of Rs. 63.49 crore was meant for implementation of CDP. Thus the total revised outlay for implementation of CDP during X Plan has been Rs. 244.47 crore against which the actual expenditure incurred was Rs. 199.11 crore till 2005-06, which registers 81 percent of achievement.

12.58 Most of the schemes under Mulberry sector have progressed well registering an off-take of Rs. 123.97 crore (127 percent) against an outlay of Rs. 97.54 crore. The off take was primarily due to the essential nature of the components such as plantation, rearing house, appliances, etc. and suggested for continuation during XI Plan.

12.59 Four schemes were implemented under Tasar registering an off-take of Rs. 11.70 crore (72 percent) against a total outlay of Rs. 16.36 crore. All are essential schemes and need to be continued during XI Plan.

12.60 In Eri, three schemes were implemented with an off-take of Rs. 12.16 crore against an outlay of Rs. 2.52 crore registering an increase of 483 percent. The increase in progress is mostly due to construction of rearing houses which is an essential part of the activity and hence to be continued for the XI Plan. The one-time assistance for raising eri food plants can be restricted to perennial trees only. However, the assistance for rearing house and appliances need to be provided for all.

12.61 In Muga, four schemes were implemented at an outlay of Rs. 11.57 crore with a utilization of Rs. 12.12 crore registering a progress of 105 percent. All these are essential components and hence are continued during XI Plan.

12.62 Under Post-Cocoon sector, the total outlay was Rs. 50.39 crore of which an amount of Rs. 27.84 crore was utilized registering a progress of 55 percent. The reeling sector could not take off because of excessive difference on subsidy during IX

Plan and lack of initiative and motivation on the part of CSB to implement the schemes. This is only due to low off-take of multi-end reeling machines. Non-availability of sufficient quality Bivoltine cocoons at reasonable price; and returns not commensurate with the high investment on machinery.

12.63 The following schemes were approved during March, 2006 and considerable progress is expected by the end of the plan period and hence recommended for continuation during the XI Plan.

- Assistance to Private Silkworm Seed Producers
- Setting up of Eri Raw Material Bank
- Setting up of Automatic Reeling Machines
- Establishment of Cottage Basin Units
- Establishment of Hot Air Drying Chambers / Ushna Kothis
- Scheme to dissuade Child Labour with use of Improved Technologies
- Common Facility Centre for Yarn processing
- Promotion of Improved Handlooms developed by CSTRI, Bangalore
- Setting up of Common Facility Centre for Yarn Production linked to Mechanised Spun Silk System
- Support for Byproduct utilization
- Establishment of Vanya Silk Market Promotion Cell

Achievement Gap:

12.64 The area under mulberry has gone down in the beginning of the X Plan period due to continuous drought resulting in shifting of the cropping system from mulberry to horticulture crops requiring less quantity of water. Added to this, the dumping of Chinese silk has brought down the price of Indian silk below economic threshold level.

12.65 The shortfalls in the production of Bivoltine silk was mainly due to:

- Insufficient adoption and proliferation of Technology Packages developed through R& D efforts
- Almost no conspicuous effort to increase the area under mulberry

- Fragmented and adhoc approach and non-involvement of private partners in a big way in seed production, farming and reeling
- Non-penetration of the schemes to the desired level
- Improper forward and backward linkages
- Dumping of cheap Chinese raw silk and fabric etc.

Lessons from the past:

- The slow growth in raw silk production in spite of increase in production parameters clearly suggest that unless the area under food plant cultivation is increased substantially, no break through can be achieved in the production targets.
- Cocoon production being the most profitable agriculture activity, with about 57 percent of the total value in the silk chain, this should have been an attraction for the private sector (farmer and industry) in a big way. This opportunity was not exploited properly.
- The total Government Spending during IX Plan was Rs. 384.04 crore and the allocation during the X plan was 526.99 crore. We need to devise schemes where involvement of private investment and also more credit inflow increases and the contribution of the Government spending / subsidy gradually decreases.
- In spite of many years of planned intervention silk remains as an elitist fabric. Consciously it is to be aimed at making it a 'common man's fabric'. This can be primarily achieved through cost reduction, increased production volumes and price rationalization and innovative use of silk in daily life.
- Sericulture has largely remained restricted to the southern states and even conscious efforts to spread the activity across the country have not yielded desired results so far.
- Approach so far has been somewhat piecemeal. Sericulture should have been tried to deserve as a self contained activity with all its value addition stages like cocoon production, reeling, spinning and weaving etc. in the form of clusters in particular area / district or state.

Road Ahead:

12.66 In order to increase the production of raw silk, there is a need to increase the area under cultivation in both traditional (particularly in the non-traditional areas) and non-traditional states with increased productivity as the main focus. The following are the necessary steps in this direction.

- Mapping of potential sericulture areas in the country, creation of marketing facilities in the non-traditional states and also the new areas in the traditional States and planning for each area based on its requirements and potential.
- Identification of areas for bivoltine and hybrid cocoon production both in mulberry and non-mulberry sectors and intervention with a selective approach based on the potential of the area.
- Promotion of Vanya silk and, if need be, formation of a special cell in CSB to be constituted at some non-traditional states to monitor the promotion of Vanya silks.
- Analysis of the causes for decline in the sericulture area and reclaiming such areas/farmers for reintroduction in sericulture by devising innovative schemes and packages for the same.
- Popularization of the cost benefits advantage of sericulture in a concerted manner through direct contact with villagers.
- Expansion in the numbers of extension and technical service centres with the assistance of State Governments / NGOs / Private sector so as to disseminate the knowledge to the fields speedily.
- Expansion of cluster approach and Institute Village Linkage Programme (IVLP) in all the new areas and also in all non-traditional states and focusing our attention on such areas with a 'project' approach.
- Planning for creating matching reeling capabilities by use of multi-end and automatic reeling machines for each sericulture area in the private and cooperative sector
- Proportional increase in the seed producing capacities and chawki rearing centres by way of expansion of the schemes in private sector
- Dovetailing the sericulture programme with schemes of other Ministries like SGSY and the schemes of the State Governments etc. in a big way

12.67 Association of Private Sector and especially the major agro-based industries in both pre-cocoon and post-cocoon segments is essential and this should be a thrust area under the XI Plan. This can be achieved through:

- Inviting and facilitating industries like ITC, Duncan, Moncento and other medium and small corporate sectors in the production of cocoons by way of Contract Farming on the pattern of Sugarcane and Cotton. The required changes in the land laws, if necessary, are to be brought urgently. Special schemes are to be envisaged for it.
- Promotion of cooperative sericulture practices on the patterns of sugarcane. Special schemes are to be envisaged to achieve it. Some special incentive can be provided to develop “Co-operative” efforts.
- Participative association rather than subsidy oriented involvement of the private sector.

12.68 Promotion of silk as a common man's fabric involves:

- Increase in production volumes as above
- Blending of silk with other cheaper fibres
- Rationalisation of prices of raw silk year by year with steps like silk grading
- Selective imports whenever necessary

12.69 In order to make best use of strength of all the four varieties of silk in the country, research and development in the areas of reeling, twisting, spinning and blending needs to be focused. It may create exotic fabrics which may be used for furnishing, carpets and other dress material. Such R&D projects should be launched with the association of the industry and also the NIFT. Thus instead of only following the existing trends in foreign demand, attempt should be made to change and promote Indian trends in the foreign markets. To this end, if need be, a ‘Product Development Cell’ with CSB exclusively for the job may be created and supported with sufficient budget for R&D.

12.70 With the passing of the amended Central Silk Board Act in the Parliament, it also needs to be seen if restrictive practices of state laws in the area of marketing of cocoon, too, need intervention. Suitable rules should be framed and implemented early to reform the system.

12.71 In the name of IT initiatives, funds have spent on futures trading and hardware purchases without desired results. The IT initiative should first focus on interlinking of various markets in the country on a portal of CSB where rates of cocoon and yarn should be available on daily update basis for the benefit of farmers and also measures which could directly increase productivity and efficiency. This should primarily be done with the assistance of NIC which has substantial expertise in the field.

12.72 Sericulture requires larger doses of technical expertise at all stages. This is possible by way of expanding the geographical presence of sericulture with extensive support from trained extension workers. Any Technology Mission in the area should actually devolve substantial funds on R&D and extension network following 'Cluster' and 'Lab-to-Land' approach. This should be done as far as possible without increasing the number of Government employees and by using contract system and other innovative methods. Any administrative hurdle in this regard should be removed. There is need to envisage new schemes in this direction under the proposed Technology Mission and also the XI Plan.

12.73 There are other micro-level and subject specific suggestions available with CSB based on various studies/consultations and research done in sericulture and it would be worthwhile if at least those suggestions are implemented which are found fit, while formulating and implementing the schemes under the XI Plan.

12.74 Though Indian breeds are having potential to produce the same quality of Bivoltine silk as that of China, there has been lack of sufficient thrust on the adoption of improved technologies, strict disease control measures, lack of quality leaf due to insufficient inputs to mulberry garden, use of young age silkworms, appropriate mountages and lack of grading system for cocoons and quality based pricing system. The success of Chinese sericulture is due to extensive pushing of technologies through an organized effort and extensive use of organic inputs which maintain the soil health and therefore a healthy crop. The experience of Japan International Co-operation Agency (JICA) Project and the Institute Village Linkage Programmes in Southern India has shown similar results with Bivoltine. It is therefore, suggested to replicate the models through a cluster approach in all other places.

It involves –

- Large-scale Bivoltine seed production

- Supply of chawki worms to all Bivoltine farmers
- Supporting the farmers with required infrastructure like rearing house and improved rearing appliances under the existing CDP schemes
- Extensive training and demonstrations by bringing the active participation of Self Help Groups and Expert Farmers
- The efforts shall be on a cluster basis which include a grainage linked to Chawki Rearing Centres (CRCs), Expert Farmers and Commercial Farmers and the Reelers.

SETTING FOR THE ELEVENTH PLAN

SWOT Analysis of Indian Silk Industry:

Mulberry Sector

Strengths:

- One of the most profitable activities in rural sector
- Comparative advantages such as large production base, availability of skills, land and labour, easily adoptable technologies
- Fairly established infrastructure, silkworm breeds, proven farmer – friendly technologies
- Short gestation period
- Favourable agro-climatic conditions and sustainable technologies
- Strong domestic demand coupled with use of silk garments on festive occasions
- Tradition of creating exclusive designs and items having niche market
- Popularity of hand woven silks in the west which have no threats of quota like other fibres
- India holds a monopoly in the production of yarn dyed silk fabrics
- Availability of indigenous technology at low cost

Weakness:

- Handling live biological material always involves risk
- Inconsistency in output quantity and quality due to natural vagaries
- Poor technology transfer and extension support
- Inadequate market linkages in states other than Karnataka
- Highly decentralised with small and scattered production
- Poor credit from financial institutions

- Obsolete equipment with low productivity and quality
- Thin fluctuating margins resulting in lack of focus on modernization leading to poor quality of the produce
- Dwindling family skills due to shifting for remunerative employment
- Lack of quality consciousness
- Extreme fluctuations in cocoon and raw silk prices

Opportunities:

- High rural employment potential
- Discontinuation of silk production by developed countries due to high cost of labour
- Development of marketing avenues for silk products
- Increasing domestic consumption of silk which is expected to reach 35,000 MT in next few years
- Shifting of garment manufacturing from Western Europe to Asian countries due to high labour cost and the garment export from India has been increasing steadily

Threats:

- Falling prices due to dumping of Chinese silk and fabrics
- Inability to meet the changing quality requirements
- Small reelers and weavers are dependant on mahajans for whom they work on piece rate basis often subject to exploitation
- Heavy dependence on single source of imported silk for exports is risky.
- The indigenous silk is more expensive than the Chinese silk and imposition of antidumping duty is a temporary relief and subject to revision and a serious potential threat
- Lowered water table and prolonged drought

Non-Mulberry (Vanya) Sector

Strengths:

- Rearing on nature-grown host plants keeps off the cultivation cost
- Abundance of manpower in the tribal areas

- Availability of natural population which forms a sizable collection of tasar cocoons
- Augments the earnings of the tribes in the forest areas
- Strong market demand for vanya silk products,
- Natural colours are preferred and hence there is less pollution from the use of dyes
- Niche market for the traditional products

Weaknesses:

- Wild varieties are prone to natural vagaries,
- Deforestation leading to reduced availability of food plants
- Non-amenability of some high productive eco-races to human handling
- Inadequate silkworm seed supply
- Limited opportunities for breeding better breeds
- Out-dated reeling appliances with low productivity and hazardous reeling practices
- Lack of interest on the part of the State Governments
- Meager state budget for sericulture
- Lack of initiatives in new designs and product diversification,
- Exploitation of the primary producers by middlemen or traders
- Lack of efficient technology transfer system

Opportunities:

- Low production compared to its demand
- Generates rural employment
- No competition from heavy industries
- Attractive market potential
- Huge manpower availability in the silk growing areas
- High skills in weaving and designing
- Special attraction for the natural golden luster of muga silk

Threats:

- High production cost

- Outdoor rearing results in uncertainty in crop output
- Deforestation and reduction in food plant resources
- Reeling and weaving are done on primitive appliances leading to poor quality and productivity besides being hazardous to health
- Lack of awareness about the consumer demands due to their confinement within the area

TEXTILE POLICY OF GOVERNMENT OF INDIA:

Focus will be on achieving international standard in all varieties of silk. Steps will include:

- Improving Research & Development and the effective transfer of technology at all stages;
- Considerably improving the production of non-mulberry varieties of silk;
- Augmenting efforts for the spread of bivoltine sericulture;
- Encouraging clustering of activities of reeling and weaving and strengthen linkages between the producers and industry;
- Periodically reviewing the import policy for raw-silk taking into account the balanced interests of the sericulturists as well as export manufacturers.

Grounds Set for the XI Plan:

- Large scale expansion of the production base through expansion of area under silkworm food plants to the potential non-traditional areas
- Tapping and promoting raising silkworm food plants in unused or waste or degraded lands belonging to Panchayats, forest and other entities
- Developing the unused silk farms and other seed production and reeling infrastructure available with the State Governments and putting them to use
- Following selective approach for various types of silk cultures and practices based on regional differences
- Involvement of large private entrepreneurs to the seed production cultivation and reeling and allied activities promoting contract farming
- Promoting Public-Private Partnership in innovations, development and transfer of technology
- Inter-linking of various activities in sericulture and allied activities through a cluster approach

- Involvement of SHGs, Panchayats and also voluntary organizations in the sector and other local bodies and bankers in the development process
- Development of poorer sections by providing assistance to upgrading lower versions of machinery consuming lower quality cocoon and yarn adding value to the product
- Development of small entrepreneurs for production and supply of biological inputs, or services required in the silk industry
- Product diversification and innovation of new products of curiosity and attraction
- Generic promotion of silk and brand promotion
- Promoting traditional crafts and ethnic designs of indigenous origin in the major markets inside and outside India

APPROACH TO THE XI PLAN

Aims:

- To enlarge employment opportunities, income and sustainable livelihood in rural areas through expansion of area under silk production
- To increase the production, productivity and quality of silk through transfer of technology and modernising various sections of the industry
- Exploit the full potential of sericulture developing the linkages through cluster approach
- To bring in large scale private participation and private investment in promoting the silk industry
- To optimise the output of human power through knowledge and capacity building
- To improve the productivity of silk per unit area of land
- To enhance the quality of silk produced at economically viable costs to substitute import of raw silk
- To innovate high end exportable products to boost exports and thereby the national economy

Goals for the XI Plan:

- To enlarge the annual raw silk production base to 26,000 MT

- To enlarge the area under mulberry silkworm food plants to 2.50 lakh ha by adding 0.50 lakh ha
- To provide remunerative employment to about 77.04 lakh persons
- To optimize the out put of the human power engaged in silk production
- To raise the average national mulberry silk productivity to 100 kg/ha per year from the existing 85kg
- To bring down the cost of production of mulberry raw silk closer to that of imported silk yarn
- To increase the production of non-mulberry silk yarns to an average of 150 gm from the existing 125 gm per person-day
- To enhance export earning to Rs. 4,500 crore per annum

Production Targets:

12.75 To reach the production target of the plan by 2011-2012, majority of the plantation activity should be over by the 3rd year since mulberry takes at least 2-3 years to reach optimum yield and tasar and muga food plants take around 5-7 years.

The details of production targets are presented below:

Table 12.3
Year-wise Raw Silk Production Targets for XI Plan:

Particulars	2007-08	2008-09	2009-10	2010-11	2011-12
Mulberry Area (lakh ha)	2.00	2.15	2.30	2.45	<u>2.50</u>
Mulberry Raw Silk (mt) (Bivoltine) (mt)	17975 (1880)	19030 (2380)	20180 (3015)	22200 (4500)	<u>23000</u> <u>(5000)</u>
Non-mulberry					
Tasar Raw silk (mt)	350	365	380	395	<u>420</u>
Eri Spun Silk (mt)	1890	1990	2120	2175	<u>2390</u>
Muga Rawsilk (mt)	160	165	175	180	<u>190</u>
Total Raw silk (mt)	20375	21550	22855	24950	<u>26000</u>
Employment (lakh)	64.11	66.98	69.64	74.16	77.04
Exports (Rs crore)	3770	3970	4150	4325	4500

Units: Area in lakh hectares; Raw Silk in Metric Tones; Employment in Lakh Persons; and Exports in crore Rupees.

Figures in the last column (2011-12) represent the XI Plan targets.

12.76 The state-wise projection of targets for mulberry sector and vanya raw silk is given in **Appendix – 12.4 & 12.5**

12.77 The possible growth rate has been worked out through regression analysis. But the area under mulberry has been worked out cautiously on the fact of the growth rate of food plants adding some convenience to reduce the burden.

Benchmarking for XI Plan:

12.78 **Mulberry Sericulture:** It is proposed to increase the area under mulberry by 50,000 ha to reach 2.5 lakh ha, 80 percent of the new mulberry gardens, i.e., 40,000 ha will be under irrigation (IG) and 20 percent (10,000 ha) will be under Rain-fed system (RG)

- **Each ha of IG yields 30 MT of leaf**
- **Each ha of IG yields 1200 kg of cocoon @ 1 kg / 25 kg leaf**
- **Each ha of IG yields 150 kg of raw silk at a renditta of 8**
- **40,000 ha of IG should yield 6000 MT of Raw Silk**
- **Each ha of RG yields 8 MT of leaf**
- **Each ha of RG yields 320 kg of cocoon @ 1 kg / 25 kg leaf**
- **Each ha of RG yields 40 kg of raw silk at a renditta of 8**
- **10,000 ha of RG should yield 400 MT of raw silk**

Thus the new plantation should add at least 6400 MT of mulberry raw silk.

Brushing Capacity of per ha (Dfls)/Year for Cross Breed

Irrigated: 2000

Rainfed: 1000

Brushing capacity for Bivoltine/ha (dfls)

Bush Plantation: 1500

High Bush / Tree Plantation: 500

12.79 It requires 9.0 crore dfls of cross breed and 3.2 crore bivoltine dfls to reach the targeted silk production. It requires 45 CB grainages and 22 BV grainages.

Requirement of Reeling Infrastructure:

12.80 Reeling Sector has seen a poor growth during X Plan. To produce 7000 MT of raw silk expected at the end of XI Plan about 1620 reeling units of various capacities (40,000 ends) are needed. It is estimated that there are 25,000 cottage basins / filature units in the country with an average age of 8 years and average holding size of 8 basins. Likewise, there are around 1, 82,000 handlooms and 30,000 power-looms

with an average age of 15-20 years. There is a need to upgrade these sectors so that quality products can be produced at competitive prices. About 20 percent improvement in productivity in addition to yarn quality can be achieved by upgrading the old machines. Additional Production of raw silk to the tune of 7000 MT will feed to 80,000 handlooms and 20,000 power looms / shuttles looms for converting it into superior grade of fabric. Therefore there is a need to upgrade the Handlooms, Power looms and wet processing sectors.

12.81 It is necessary to support non-mulberry reeling/spinning activity to improve the productivity and reduce drudgery. It requires introduction of motorised dupion machine to reduce drudgery and improve production and quality. Moreover conscious effort would be made to utilize resources from schemes like TUF and other such schemes from the small and village enterprises sector, which has not been tried during the X Plan.

Non-Mulberry (Vanya) Sericulture:

12.82 It is estimated that one hectare of oak plantation can yield about 6 kg of silk in the sole crop while the tropical tasar food plants can yield around 12 kg in two crops. Muga with two commercial crops can also yield around 16 kg of raw silk per hectare. Ericulture in the North Eastern states gives about 25 kg of spun silk per hectare. They largely depend on nature grown food plants with total leaf harvest.

12.83 Ericulture in the non-traditional states based on castor or tapioca which is primarily grown for oil seed or tubers, 250-350 dfls can be reared per hectare per year, by harvesting 25-30 percent of the leaves, which can yield about 6-8 kg of spun yarn / ha. If spun on mill it will be 5-7 kg only. The following benchmarks have therefore been set for non-mulberry:

Table – 12.4
Bench Marks for Non-mulberry:

Details	Unit	Tasar		Muga		Eri		OakTasar	
PLAN		X	XI	X	XI	X	XI	X	XI
Dfl to dfl ratio		1:4	1:8	1:3	1:7	1:40	1:45		1:3
Uptake of dfls/ha	No.	225	400	1500	2000	550	1000		400
Cocoon yield /dfl	No.	35	55	50	60	0.07 kg	0.09 kg	20	30
Standard norms to produce 1 Kg silk									
No. of cocoons		1800	1800	5500	5500	1.40 kg	1.40 kg	4000	4000
Raw silk	Kg	1	1	1	1	-	-	1	1
Ghicha/Spun	Kg	0.40	0.40	0.8	0.7	1	1	0.3	0.3
Fabric/kg	Mtrs	11	11	11	11	6	6	10	10

Tasar Sector:

12.84 Seed: The envisaged tasar silk production requires about 1.13 crore. It is necessary to plan for bridging the gap of 0.34 crore of commercial dfls. This requires upgrading 8 Basic Seed Multiplication and Training Centres (BSM&TCs) as Nucleus Seed Stations. These BSM&TCs will be assisted with necessary input support, which includes strengthening of existing buildings, construction of grainage houses and providing equipment along with plantation support. Alternatively, some of them can be sanctioned to the NGOs or SHGS having expertise in this field. They can be further trained at the CSB Institutions and the units maintained under close supervision of the experts.

12.85 In tasar sector, the basic seed supplied by CSB is not multiplied to the desired level of multiplication at the state level. Present level of multiplication is less than 1:3 against the target of 1:10 and it is necessary to achieve the minimum multiplication ratio of 1:8 in tasar to bridge the wide gap between demand and supply.

12.86 It is envisaged to support 1000 Private Graineurs and 10 Pilot Production Centres (PPCs) under tropical tasar sector. In oak tasar sector, 15 grainages, 1500 seed and commercial rearers will be supported to produce the required quantity of quality commercial dfls.

12.87 **Plantation and Cocoon Production:** Though tasar rearing is largely done on forest trees, systematic plantation closer to the villages can provide good support for tasar culture besides providing a green cover. It is therefore targeted to raise 10,000 ha under tasar food plantation. It is proposed to take the help of the Local Gram Panchayats, Forest Protection Committees (Vana Samrakshana Samithis), SHGs at village level, Forest Department, NGOs, etc. for the purpose. Wherever possible, the schemes for development of tasar food plants will be dovetailed with the aforestation schemes of the Department of Forest and Environment. Chawki rearing with good care in compact area has been a good approach to check loss at younger stages and improve the overall performance. It is therefore proposed to support 15,000 farmers for raising and maintenance of chawki garden. On similar grounds, it is proposed to raise 1500 ha of oak tasar food plantation.

Eri Sector

12.88 **Seed Support:** The requirement of seed has been estimated to be 3.37 crore. The present production is 2.39 crore and facilities need to be developed for the additional of 0.98 crore dfls. To produce the additional dfls, 5 SSPCs will be strengthened or set up during XI Plan. These SSPCs will be assisted with necessary input support, which includes strengthening of existing building, construction of grainage houses and providing equipments along with plantation support. To increase the quality eri silkworm seed in the country, the Eri Silkworm Seed Organisation (ESSO) will be strengthened. To produce the additional dfls, the 5 Eri SSPCs will be assisted with necessary input support, which includes strengthening of existing building, construction of grainage houses and providing equipments along with plantation support. It is also envisaged to support 2000 Eri Seed Rearers / Pvt. Graineurs, 50 Eri Farm cum grainages to produce the additional quality dfls in the country.

12.89 **Plantation and Cocoon Production:** When cultivated, only perennial food plants proved economical. They include kesseru, payyam and barkesseru (specified species only). However, no specific target has been kept. Outside northeastern region, Castor and tapioca are grown as agriculture crop for oil seed and tubers. Hence there is no need to provide support for cultivation of these species on a regular basis. It is proposed to enhance their income by partial utilisation of leaves (up to 30 percent) for

ericulture without affecting the yield of the primary crop. It needs support for rearing appliances and rearing shed. It is envisaged to cover 4800 ha (12,000 acres).

Muga Sector:

12.90 **Seed:** The seed requirement to reach the production target is estimated to be 1.30 crore. The present production is around 1.05 crore and an additional 0.25 crore commercial dfls have to be prepared per annum. This needs strengthening of the existing P4, P3, and SSPC units of MSSO. The proposed support includes strengthening of existing building, construction of grainage houses and providing equipments along with plantation support. In addition, it is necessary to support 700 Muga Private Graineurs, 20 Muga Farm cum grainages to produce the additional quality dfls in the country.

12.91 **Plantation and Cocoon Production:** It is envisaged to raise 4000 ha (10,000 acres) of muga food plantation during the period. For this, 500 farmers will be assisted for raising nursery for muga food plants.

Approach for Achieving the Goals:

12.92 **Region-Specific Approach:** The agro-climatic, demographic and other factors vary greatly from region to region. Different areas are suited for different types of silkworms and different breeds or different practices. The practices also vary with the terrain.

12.93 **Mapping and Selection of Suitable Areas:** The selection of the enterprise, the practices etc. are on a **region specific approach**. It shall be on the basis of i) suitable soil; ii) temperature (between 20⁰C and 35⁰C at least for six months in a year); iii) irrigation facilities or good rainfall spread over 7-8 months; iv) wage pattern; v) dependency on agriculture and agro-enterprises; vi) competing crops; vi) amenability of the target groups to learn, systematise and potential entrepreneurial qualities; viii) facilities for quick transport of the green cocoon to potential reeling clusters; potential market areas, etc. By following the approach, it is possible to plan the allocation of the funds prudently. While the efforts shall be to tap all possible non-traditional areas, we will be cautious in entering new areas. The food plant species or varieties, silkworm breeds or races, the cultivation practices, etc., have all been well defined for different regions, which will be followed.

12.94 Project Mode Approach: All the development activities shall be on a project mode with clear goals, measurable targets, resources, and time schedule based on established facts and defining the project area. The activities and their measurable outputs shall be monitored and reviewed on a pre-drawn Project Design Matrix providing required guidance and direction to implementing persons. CSB shall provide its expertise to the Department of Sericulture and all implementing partners to this extent. A pool of CDP schemes shall be chosen along with suitable modification to be dovetailed into the project. The Centrally Aided projects can be dovetailed to the state projects or the projects of other Ministries such as Ministry of Rural Development, Ministry of Agriculture and Cooperation, Ministry of Forests and Environment, and also the other sectors in the Textiles, like Handlooms, Powerlooms, etc. which provide critical forward linkages to Sericulture Sector.

12.95 Cluster Approach: This works well in the under developed and new areas and require extensive efforts in organising various inter-linked groups in the supply and beneficiary chain. It is essential to involve and plan from the village panchayat level, taking help from the reputed Voluntary Service Organisations, Rural Development Agencies, Financing Institutions, etc. from the project formulation stage to facilitate organising producer groups and integrating them into the production chain to reach a marketable end product within the geographical niche. This essentially involves grouping and organising a large number of (around 200-250) primary (cocoon) producers, reelers & twisters, weavers and all others involved in processing, trading, etc. including allied activities. CSB would implement the schemes of Pre- and Post Cocoon sectors in the form of clusters and not in any scattered manner. Each cluster would have its own reeling and marketing forward linkages. Old clusters too would be provided with these forward linkages.

12.96 Public-Private Partnership Enterprises in Sericulture: The interests of different partners in this system when joined together can have a synergistic effect. This can be very useful in developing working economic or commercial models through which the technology can refine and penetrate easily. This can be useful in R&D institutions as well. Developmental programmes can be dovetailed to the CDP Schemes while R&D programmes can be taken with collaboration between the Institute and the Entrepreneur. CSB would attempt to ensure at least matching private resources in the sector as its own Plan size.

12.97 **Cooperative Farming:** It is proposed to organize the activities particularly in the new areas under cooperative system on line with cotton, sugarcane and dairy. The purpose is to bring all essential linkages into the system to organize sericulture as an economic activity. The help of reputed NGOs, the local authorities, Financial Institutions etc. are essential to organize this activity. Funds can be tapped from Ministry of Rural Development and other similar Departments, which can be dovetailed to CDP Schemes.

12.98 **Contract Farming:** To keep up the production and quality at international standards, it is necessary to make large investments in seed production, farming, reeling and processing. It is also possible to link up large number of small farmers to few large entrepreneurs capable of making huge investments and organizing as in castor cultivation, sugarcane cultivation, etc. This requires heavy dose of technical inputs for capacity building. The help of NGOs and other rural development organizations, Banks etc. can be taken and the CDP components dovetailed to this. Providing the required inputs, maintaining the quality, monitoring and marketing is much easier in this system. Large bivoltine grainages, chawki rearing centres automatic or multi-end reeling units can be an integral part of this system.

12.99 **Inviting Large Entrepreneurs:** It is proposed to bring in large investors in Silkworm seed production and reeling activities with latest facilities including all linkages. The existing CDP Schemes can be availed for these activities. It is also proposed to keep the scheme for Establishment of Large Bivoltine Grainages or upgrading the infrastructure for bivoltine seed production open for State Departments and suggests CSB to upgrade some of their seed production centres for bivoltine seed production.

12.100 **Institutional Credit:** During the X Plan, the credit requirement was estimated around Rs. 430.00 crore (including Rs. 400.00 crore for On-Farm Sector and Rs. 30.00 crore under Non-Farm Sector). The credit flow during the first three years of the Tenth Plan was Rs. 43.92 crore, which is insignificant even in comparison to other sectors within textiles. During Eleventh Plan, it is suggested to operationalise credit linked subsidy schemes to enhance the credit flow and generate additional resources.

12.101 Information Technology: It is proposed that CSB shall concentrate on networking of various cocoon and silk markets, information on the availability of raw materials, market trends, etc. on its website for the needy ones. Information required for stakeholders in silk industry can be placed including some technical bulletins useful for the extension workers, farmers and other stakeholders. IT would be used to increase productivity in this sector and increase the efficiency of the delivery system without any wasteful expenditure. Existing infrastructure of NIC shall be utilized in all possible manner and an NIC Cell shall be started in CSB on the pattern of Government of India and other Government Institutions.

12.102 Market Initiatives: The Ministry has sanctioned establishment of Vanya Silk Marketing and Promotion Cell (VSMPC) at a total cost of Rs 3.05 crore as additional inputs under CDP during March 2006. CSB has initiated action to take collaborative projects with NIFT, NID, Army Institute of Fashion Design (AIFD), Tirpur Exporters Association (TEA) to undertake market survey, develop new products based market demand and changing fashion trends. Vanya Silk Shops are under establishment in New Delhi and Bangalore to provide network and market support to the NGOs producing Vanya silk from the interior parts of the country. Exhibitions are being organized in different cities as a part of “Brand Promoting Exercise” to provide market avenues for the Vanya silks.

12.103 Support for Cocoon Banks: Marketing is a major problem in non-mulberry sector and in non-traditional areas. Similarly, tasar cocoons are produced in one or two seasons and the cocoons are purchased by the mahajans exploiting the farmers and also that the raw material is not available to the reelers or weavers on a regular basis. It is therefore proposed to provide support to establish cocoon banks under cooperative sector of with voluntary organizations.

12.104 Promotion of Silk Mark: The Central Silk Board came up with an initiative for the protection of the interests of the consumers and other stakeholders of the silk value-chain by bringing out “Silk Mark” Scheme in June 2004. Silk Mark Organisation of India (SMOI), is a registered Society sponsored by the Central Silk Board. Silk Mark labels can be affixed to primary, intermediate and finished products of silk including yarn, fabric, sarees, made-ups, garments, carpets, etc. The scheme is aimed at protecting the interests of the users and connoisseurs of silk, and for the generic promotion of silk and also for building brand-equity of Indian Silk

internationally. Over 450 members have joined the organisation, of whom, 360 are authorized users. During two years of its operations, nearly 16 lakh Silk Mark labels have reached the market. The objectives are to i) familiarize the logo as a “hall mark” for the purity of silk ii) create awareness among various sections of customers and stakeholders and iii) build brand-equity of Indian Silk internationally by net-working various global players. The activities are i) launching intensive publicity campaign; ii) mass communication; iii) participating in the International Fairs, Buyer-Seller Meets and direct buyers interaction with large buying houses and Life-style Stores and Branded Wholesalers and Retailers. The targets are to add 200 members annually and earn sufficient annual revenue from membership fee, authorized user fee and sale of labels; and export utility services and other activities so as to make it self-dependant by 2012. Simultaneous efforts would be made to make SMOI an independent body dissociated with Government and CSB by the end of the XI Plan.

12.105 Information and Publicity: It is necessary to bring various publications on the technologies, schemes both on printing and electronic media and organising or participation in various exhibitions, fairs, etc. by CSB to educate people on various aspects of the silk industry. The states shall also be provided assistance for preparing the technical bulletins and other literature in the local languages.

12.106 Development in the North East: North East region continues to be a priority area and receive the major thrust. Muga, Eri and Oak Tasar shall be priority areas while mulberry receives its share. Development of silkworm host plants and privatisation of seed production remains a priority. It is proposed to establish a Regional Research Station for Post Cocoon Technology with emphasis on Muga and Eri silk processing. It is also proposed to strengthen the Central Muga and Eri Research and Training Institute at Lahdoigarh (Assam) with required staff and infrastructure.

12.107 Gender sensitization in Sericulture: The approach for XI Plan is to provide greater emphasis for empowerment of women in sericulture by instilling a mechanism wherein the policies and programmes would be initiated and taken up on a long-term basis. The areas that would touch for the interventions would be in fiscal policy planning for women, infrastructure support, review mechanism, capacity building both for the beneficiaries and implementing agency, access to credit by creating Women Credit Fund, access to land, special marketing facilities, creating and

disseminating women friendly technologies, social security measures, etc. This would be achieved primarily by ensuring about 30 percent reservation for women beneficiaries under the existing schemes.

12.108 However, some exclusive women oriented programmes / schemes may be formulated during the XI plan where the focus would be on creation of Self Help Groups for various activities. These schemes would be assisted by Central Government / State Government / Contribution by women Self Help Groups and also dovetailing the resources from other schemes of other Ministries wherever applicable. A special provision of Rs. 10.00 crore is being made for such new schemes.

12.109 **There shall be focus on SC/ST persons in the industry:** It is proposed to extend certain concessions like reduced beneficiary share by 10 percent of his contribution, preference in extending the benefits etc. It is suggested to take up special programmes in the areas dominated by their population.

12.110 **Administration of Central Silk Board:** The Administration of CSB includes Board Secretariat, Regional Offices, Regional Development Offices, Certification Centres, etc. The Board Secretariat of CSB monitors the implementation of various Schemes and co-ordinates with the Ministry and the States in implementation of various Projects in the Sericulture sector.

12.111 The present set-up of CSB along with its Regional Offices and allied bodies needs to be streamlined so as to gain the optimum utilization of its infrastructure and human resource utilization.

12.112 **Human Resource Requirements:** As of now, the Central Silk Board (CSB) has a sanctioned strength of 4425 and the working staff strength is 4335 of which scientific and technical staff are 822. By 2011-12, 349 staff will retire including 96 scientific personnel. The expansion of the sector needs adequate human resource.

12.113 **Catalytic Development Programme:** Government of India has approved a number of schemes under this programme for capacity building at stakeholders' level including training. However, there is a need for flexibility among the schemes in their application, in different regions. Hitherto they have been implemented on a piecemeal basis without linking to the end result, i.e. the production. It is proposed that projects be formulated dovetailing with CDP Schemes by different states or NGOs or other

service agencies indicating the goals, financial and physical targets and measurable deliverables.

- **‘Farmers’ Field Schools’** – The farmers will be trained in assessing their own ecosystems and in turn they will train their counterparts within the village system. They form the messengers of technology in the village and are much closer to the farmers in need. This has been a successful intervention in Agriculture. No infrastructure needs to be erected and the available local infrastructure will be utilized through Panchayat channel.
- **‘Sericulture Poly Clinics’** – It is proposed to set up activity based Poly Clinics on the lines of Agriculture Poly Clinics set up during the X Plan by the Ministry of Agriculture and Cooperation, Government of India. These are run by trained personnel who will be supplying the inputs required for sericulture besides serving as knowledge centres in rural areas. It would be done through private participation.
- **Establishment of Production Units for the production of biological inputs like Bio-fertilizers, Bio-control Agents, Bio-pesticides etc.:** The R&D institutions have developed a number of technologies to isolate and multiply these inputs which help reduction in the input cost and providing safe environment. This facilitates the availability of inputs to the farmers in a wider area. Under the scheme, assistance can be provided by the Government coupled with bank finance. This can even be given to reputed NGOs.
- **Support to micro-entrepreneurs for disinfecting rearing houses:** Support may be provided for procurement of two/three wheelers, sprayers and other accessories partly from Government support and partly from credit from banks. They are expected to disinfect the farmers’ rearing houses and supply bed disinfectants at their doorsteps on the line in which pest control is done in small towns and cities.
- **Quality Certification:** To encourage Quality Certification, it is proposed to provide a new scheme for supporting the consultancy and other formalities involved in ISO/BIS Certification during the XI Plan. This facility is open for both private and State units.

- Promotion of large sericulture sectors on the pattern of SITP are proposed to be known as ‘Sericulture Parks’ with the involvement of Private and State Government Equity.

12.114 Research and Development: The R&D efforts shall be on the following thrust areas:

Mulberry

- Constant up-gradation of utilizable productivity of mulberry and silkworm breeds
- Reduction in risk due to pests, diseases and natural vagaries
- Improve soil health and nutrient management
- Developing and field (on-farm) testing of economic farming models with low investment
- Development of investment reduction models / devices
- Diversification and development of high value products
- Enhance the utilization of the high yielding mulberry varieties through operational research programmes such as Technology Assessment and Refinement (TAR), Technology Assessment Validation and Transfer (TAVT), Institute Village Linkage Programme (IVLP), farmer-to-farmer linkage programme (FFLP), etc.
- Develop economic and functional models of bivoltine seed production centres and multi-end reeling units under public-private partnership
- Social and economic research for development of strategies to sustain competition with other developed countries

Non-Mulberry

- Develop and standardize commercially viable clonal propagation techniques for important perennial primary food plants of non-mulberry silkworms
- Development of *in situ* soil health and nutrient management
- Standardising rain water harvest and *in situ* conservation systems
- Develop improved protected rearing techniques for young instars of tasar and muga silkworms
- Survey, collection and characterization of genetic variants, if any, especially among muga and eri silkworms which can be utilized in breeding programme

- Conserving the endangered or dwindling eco-races which are not amenable to human handling but the cocoons of which were collected for silk production through public partnership
- Improvement of reeling techniques to increase productivity per unit human power
- Improvement in the texture of filament to provide a soft texture to it

Tools to Reach the Goals:

- Conventional techniques
- Non-conventional methods such as tissue culture, bio-technology, computer applications
- Strengthening of Central Tasar Research and Training Institute, Ranchi
- Establishing a Regional Station of Silk Technological Research Institute in the North Eastern Region to provide thrust to non-mulberry silk processing
- Establishing a Regional Station for development of Eri-culture as a subsidiary occupation on castor and tapioca in the Non-traditional zone
- Strengthening of Central Muga & Eri Research and Training Institute with required infrastructure and human resources
- Providing Infrastructure support for research extension in eri sector in non-traditional states
- Taping non-conventional techniques like 'Remote Sensing' for assessing food plant cultivation

R&D Programmes Common to Mulberry and Non-Mulberry:

- Product development and diversification
- By-product development
- Development of special utility products (such as bio-medical, cosmetics, etc.)
- Development of silk products from blends and mixture with other textile fibres
- To improve the feel, comfort, ease in washing and maintenance, etc.
- To provide brand equity to the ethnic designs of India by protecting under geographical indicators

12.115 Refinement and Transfer of Technology: The very fact that there has been a huge production / performance gap between the laboratory and the industry suggests large-scale technology trials, refinement and transfer. Very often, there has been over

emphasis on the technology and little or no attention to the economic part of this. It becomes, therefore, necessary to test verify them in partnership with the technology users and refine and transfer. This process therefore assumes high importance particularly in agro-based activities.

12.116 Disease Forecasting and Forewarning: It is proposed to introduce pest and disease forecasting and forewarning system for mulberry and silkworms in order to enhance the preparedness among the sericulture farmers and the State Departments of sericulture to organize effective management of pests and diseases and minimize the crop losses. This programme will be linked to National Remote Sensing Agency, Hyderabad and Indian Meteorological Departments in various states which will be implemented on the pattern initiated by the Agriculture Ministry in the X Plan, for which Centre for Rural Industry Development Agency (CRIDA), Hyderabad is a Nodal Agency.

12.117 Remote Sensing and GIS in Sericulture Development: During the IX Plan, Central Silk Board with the help of National Natural Resource Management System (NNRMS), Department of Space, Bangalore has taken up a remote sensing survey with the main objective of assessing the actual area under mulberry in different states by integrating the conventional data with Remotely Sensed Information. The study covered Mulberry sector in different states, Tasar in Orissa and Muga in Assam. The total sanctioned cost of the project was Rs. 2.20 crore. After a mid-term review, some of the states were dropped and the study restricted to a few traditional areas. This was a basically a feasibility study aimed at assessing the mulberry acreage and their growth pattern to facilitate assessment of seed requirement in advance. The expenditure was only Rs. 71.87 lakh. This will be examined so that the effort in this direction can be optimally utilized during the XI Plan.

12.118 Establishment of Soil Science & Agro-chemistry Facility: These laboratories / testing units have to be established at all the Regional Research Stations covering Mulberry, Tasar, Eri and Muga sectors. In the southern part of the country, there are six major agro-climatic zones, each having varied soil structure and climate. In the eastern part, the soils are alkaline, have low fertility, at times have high acidity, low microbial activity, heavy loam etc. In other areas, soils are excessively porous sandy soils. There is a need to initiate research to improve fertility of the soils, which

ultimately enhance soil productivity and mulberry & non-mulberry host plant leaf and silkworm cocoon production.

12.119 Establishment of Regional Silk Technological Research Station: The Central Silk Technological Research Institute, Bangalore is the only Institute conducting research on silk technology (Post-Cocoon). The Non-mulberry culture being far off, have not attracted the required attention, particularly muga. It is therefore proposed to set up the Regional Station in the North-Eastern Region to cater to the regional problems.

12.120 Establishment of Regional Eri Research Station: Ericulture has been introduced in the South-Central region of India and being propagated intensively. However some of the basic research required to establish as a lucrative enterprise is yet to be done. It is, therefore, proposed to establish the Station in the South or Central part of India.

12.121 Strengthening of Central Muga and Eri Research and Training Institute: Located in northeastern region, the Institute has been suffering for want of scientific man-power as well as equipment and infrastructure. It is necessary that the Institute work on non-conventional techniques to achieve the goals of productivity and quality. It is therefore proposed to strengthen the Institute with required man-power and facilities.

12.122 Strengthening of Central Tasar Research and Training Institute: The Institute deals with a number of food plants and silkworm eco-races, which are wild and difficult to tackle. This station also has been suffering for want of scientific manpower as well as equipment and infrastructure. It is necessary that the Institute work on non-conventional methods to achieve the goals of improving the productivity and quality. It is, therefore, proposed to strengthen the Institute with required manpower and infrastructural facilities.

12.123 Establishment of Farmers' Field Schools: For regular and easy transfer of technology between farmers, it is proposed to establish farmers' schools. It is a new concept adopted in agriculture extension system. They use their infrastructure with our inputs.

12.124 Skill and Knowledge Enhancement for Scientific Personnel: It is necessary to enhance the skills and knowledge of the scientific personnel through

regular training, participation in National and International Seminars, Workshops etc., which will be ensured for this purpose.

12.125 Sericulture Research and Development Fund: On the lines of other scientific organizations, it may be desirable to promote R&D activities by selecting efficient scientists in frontier areas on competitive basis. It is proposed to maintain a Sericulture Research and Development Fund with a corpus of Rs. 5.00 crore from the Government under the Plan. The revenue generated by the CSB Institutes from commercialization of technologies, consultancies, etc. will be ploughed into the fund.

12.126 The Product Development Cell: Established in the Central Silk Technological Research Institute, Bangalore will work not only for the revival of traditional products, but also for the development of new innovative products. The main objective of the programme is to empower the Indian Silk Industry with the right strategy for enhanced market share in the international trade, besides making available a wide choice of silk products across all segments of the domestic market. This would necessarily involve integration of efforts being done at the national and international level in the same direction.

12.127 Training Initiatives: To reach the target of 26,000 MT of silk production by the end of the Plan approximately 2.5 lakh farmers and other stakeholders including the trainers need to be trained under various programmes.

FUND REQUIREMENT

12.128 The schemes operating in X Plan have been suggested to be continued during the XI Plan. Though the reeling sector has shown poor performance during X Plan, it is the essence of quality and therefore recommended for continuation with an increased thrust. It was also suggested to continue the assistance / support as provided during the X Plan. Only major essential items have been reflected in the following account to arrive at a reasonable requirement of funds.

Mulberry Sector:

12.129 Assistance for Raising Mulberry: There was no scheme for development of mulberry gardens in the X Plan except for raising mulberry saplings. This works out to approximately Rs. 5500/- per acre to reach the envisaged production target, it needs 1, 27,500 acres including 2,500 with adopted silkworm seed rearers @ 1 acre

per farmer. The cost of planting material required is Rs. 70.13 crore, of this, Rs. 35.07 crore will be from Central Silk Board. The sapling production programme is proposed to be merged with this. This can be made use of for raising tree plantation in public places in which case, there shall be a little provision for maintaining the plantation for two years. This can be dovetailed with other local developmental schemes. This can also be used for renovating the Government farms.

12.130 Construction of Rearing House: During X Plan, it was targeted to construct 17,800 rearing houses with the central assistance of Rs. 27.5 crore. However the achievement was 33,844 with a central assistance of Rs. 54.26 crore. It is required to be continued and proposed to provide assistance for construction of one rearing house to each of the **1, 27,500** (new) farmers during the XI Plan. Considering that there are different models of rearing houses to suit to the financial capabilities of different farmers in different regions, it is proposed to have three different cost structures, 31,875 (25 percent) units of Rs. 1.10 lakh each; 63,750 (50 percent) units of Rs. 0.55 lakh each and 31,875 (25 percent) units of Rs. 0.28 lakh each; at a total outlay of Rs. 790.50 crore. The Central share works out to Rs. 237.00 crore. Government farms can also make use of the scheme for renovating their farms for using for cocoon production through leasing to land-less farmers.

12.131 Training and Start-up Tools to Farmers: It is essential to provide training and start-up tools to all the new farmers. The outlay during the X Plan was Rs. 4.33 crore with a physical target of 21,650 and the expenditure and physical achievement till 2005-06 was Rs. 9.53 crore and 52,086 rearers. It is proposed to continue the existing CDP scheme (On-farm training and start-up tools) with 15 percent hike in the unit cost, which works out to Rs. 2300/- per farmer. The total expenditure works out to Rs. 29.325 crore, which is totally under Central Sector. This shall be linked to raising new plantation.

12.132 Improved Rearing Appliances for Bivoltine Farmers: In addition to the above, it is proposed to provide improved rearing appliances to the farmers rearing commercial bivoltine hybrids to facilitate better reelability of the cocoons. The allocation during the X Plan was Rs. 22.50 crore and the utilization upto 2005-06 was Rs. 15.89 crore. While the physical target was 30,000 farmers the achievement was 25,129. It is proposed to cover 25,000 farmers at an outlay of Rs. 100.00 crore. The CSB share will be Rs. 50.00 crore.

12.133 Chawki Rearing Centres: During X Plan it was targeted to establish 750 Chawki rearing Centres with a Central share of Rs. 5.62 crore and the expenditure up to 2005-06 was 4.9 crore and the achievement 468 (excluding equipment). Since it is a crucial input for healthy rearing, it is proposed to set up 1000 CRCs @ Rs. 3.45 Lakh (15 percent hike in unit price) at an outlay of Rs. 34.5 crore during XI Plan and the CSB share will be Rs. 8.625 crore.

12.134 Assistance to Mulberry Silkworm Seed Production Units (New): To meet the silkworm seed requirement, it is proposed to set up 45 nos (20 lakh Capacity each) of Cross breed grainages @ Rs. 1.0 crore each at a total cost of Rs. 45.0 crore supported by 6 P1 grainages (each Rs. 1.0 crore) costing Rs. 6.0 crore, 3 P2 grainages (2 MV + 1 BV) at a cost of Rs. 1.5 crore including all support systems. Building of this infrastructure is essential to reach the additional target of silk production to meet the seed requirement with necessary linkages to ensure quality seed production. An outlay of Rs. 52.5 crore has been kept for this and the Central share will be RS. 13.125 crore. Both private and Government Institutions can make use of the scheme.

12.135 Establishing Large-Scale Bivoltine Grainages (New Scheme): It is proposed to set up 10 such Bivoltine seed production units of 20 lakh Capacity (@ Rs. 1.25 crore / unit) at an outlay of Rs. 12.5 crore during XI Plan under private sector especially to meet the requirement of bivoltine silkworm seed to reach the targeted production of bivoltine silk. Such large units are essential to meet the requirement of contract farming / cooperative farming. Government Institutions may also avail this facility.

12.136 Support for Upgrading Public / Private Mulberry Silkworm Seed Grainages: This scheme was approved in March 2006 to assist private silkworm seed producers by providing the critical equipment support to facilitate bivoltine seed production. This becomes essential in view of the amendment to CSB Act, which prescribes quality standards for silkworm seed. Smaller LSPs as in West Bengal will also be eligible for assistance on pro-rata basis. The allocation during X Plan was Rs.7.50 crore with a physical target of 75 units and CSB share was Rs.5.25 crore. The scheme will be carried forward with a physical target of 50 and financial allocation of Rs. 5.00 crore of which Rs. 3.5 crore will be from Centre.

12.137 Support for Drip Irrigation System: A central assistance of Rs. 30.60 crore was kept with a target of 13,472 ha during Tenth Plan and the achievement up to 2005-06 was 11,190 ha at an expenditure (Central share) of Rs. 29.06 crore. Considering the achievement a target of 20,000 ha has been set for the XI Plan with an outlay of Rs. 100.00 crore and the Central share shall be Rs. 45.00 crore.

12.138 Supply of Disinfectants to Seed Farmers: The outlay under Central Sector was Rs. 2.79 crore with a target of covering 38,900 farmers during X Plan while the coverage was 59,464 at a cost of Rs. 3.89 crore. Considering the proposed increase in seed production it is targeted to cover 80,300 seed farmers at an outlay of Rs. 24.00 crore during XI Plan in the proportion of increase in the target and adding 15 percent cost escalation CSB share is put at Rs. 6.00 crore.

12.139 Crop Insurance: An outlay of Rs. 4.3 crore (from CSB) was kept during X Plan for this purpose covering all three sectors. Only a sum of Rs. 0.53 crore was utilized. It is proposed to increase the scope to health insurance to the sericulture workers / rearers prone for health hazards through activities like seed production, reeling, wet processing etc. and accidents such as falling from trees while harvesting cocoons / leaf. It is proposed to keep a lump sum provision of Rs 4.00 crore in XI Plan and find ways and means of attracting insurers for this segment.

12.140 Setting up Production Units for Biological Inputs (New Scheme): The R&D Institutions made a number of innovations where microbes have been isolated and cultured, which can be used either to enrich the soils (bio-fertilisers) or control the diseases (antagonistic microbes) or bio-pesticides / bio-control agents and other plant / animal products used in sericulture. It is proposed to commercialize these innovations through interested qualified entrepreneurs, if required, through collaborative efforts. A token provision of Rs. 1.00 crore has been kept in the XI Plan. Budget sanctions will be on the evaluation of the Project Proposals.

12.141 Assistance for Farmers' Schools (New Scheme): It is proposed to set up 100 Farmers' Schools on the lines of Agriculture, where the expert farmer becomes the link between the R&D Institute and the farmers transferring the technology. The local infrastructure will be utilized and the contingent expenditure needs to be met by CSB. A provision of Rs. 1.00 crore is proposed for this purpose.

12.142 Assistance for Sericulture Poly Clinics (New Scheme): On the lines of Agriculture, it is proposed to set up Sericulture Poly Clinics where the educated youth run the Poly Clinics, which serve as knowledge centers and provide necessary consultancy and inputs required for the farmers. It is proposed to set up 100 such units during XI Plan at a total cost of Rs. 1.00 crore. It is proposed to link this with credit from banks.

12.143 Door-to-Door Service Agents for disinfection & Inputs Supply (New Scheme): It is proposed to encourage private service agents to carry out disinfection and supply of inputs on the lines of the private parties taking up pest control in towns and cities. The entrepreneur will be provided with assistance for two/three wheeler along with the required equipment. A token provision of Rs. 0.50 crore has been kept in the XI Plan for this purpose. This will be linked to bank financing.

12.144 Assistance for Construction of Vermi-compost Sheds: A target of 1500 units at an outlay of Rs. 1.05 crore (Central) was kept for X Plan and the achievement was 1053 and the expenditure of CSB on this account was Rs. 0.74 crore. Considering the utility, it is proposed to continue the scheme with a target of 3,000 units at an outlay of Rs. 4.20 crore with the Central share of Rs. 1.20 crore. It is also proposed to dovetail this to similar schemes available with the Agriculture, Horticulture and other Departments to enlarge the coverage.

Non-Mulberry Sector:

12.145 Augmentation and Maintenance of Systematic Tasar Plantation (including Oak Tasar): During the X Plan 7,185 ha of tropical tasar food plants, and 986 ha oak tasar food plants were raised against a target of 6,000 and 2,000 ha each. Against the targeted coverage of 10,000 farmers, 12,090 were covered for Chawki plots. The outlay (Central Assistance) was Rs. 2.66 crore while the expenditure was Rs. 2.34 crore till 2005-06. It is envisaged to raise 10,000 ha of systematic Tropical Tasar Food Plants and 1,500 ha of oak tasar food plants covering 11,500 farmers at a total cost of Rs. 18.40 crore @ Rs. 16,000/- per ha including Chawki Rearing Nets and appliances. The CSB share will be Rs. 9.30 crore. The scheme will also be utilized to raise tasar plantation in public lands like panchayat lands, degraded forest lands etc. and shall be dovetailed with other local developmental schemes.

12.146 Support for Tasar Seed Production: It is proposed to provide support to 10 Pilot Production Centres (PPCs) at a cost of Rs. 0.25 crore and 1000 private grainages at cost of Rs. 10.00 crore in tropical tasar; and support 1500 seed farmers at a cost of Rs. 1.125 crore. The allocation of Central budget during Tenth Plan was Rs. 12.90 crore and the Expenditure up to 2005-06 was Rs. 8.92 crore. The total outlay for Eleventh Plan proposed is Rs. 12.375 crore including 10 percent hike in costs over the previous plan. The Central assistance of Rs. 5.93 crore has been kept based on the requirements to reach the production targets.

12.147 Augmentation of Eri Food Plants: A target of 5000 units of half acre each was set for X Plan with the provision of Rs. 1.50 crore Central assistance and the achievement was 17,688 of half acre units with an expenditure of Rs. 4.09 crore from Central share. It is proposed to raise 4,800 ha (11850 Acre) of perennial eri food plants costing Rs. 11.85 crore including training and start up tools to 23,700 farmers. In addition, it is envisaged to cover about 1, 25,000 acres of castor and tapioca growers for 30 percent utilization of the leaves. This requires Rs. 13.125 crore @ Rs. 1050/- per farmer for training and start-up tools. Thus the Outlay for XI Plan is kept at Rs. 24.98 crore and the Central Silk Board share will be Rs. 16.59 crore. Perennial food plants can also be raised in Panchayat lands, Village Grazing Reserves, forest lands, waste or unused lands, etc. within the provisions of the scheme dovetailing to the local developmental schemes.

12.148 Support for Eri Seed Production: The Central share earmarked for X plan was Rs. 0.98 crore for 30 Farm-cum-Grainages and the expenditure from the Central share was Rs. 1.42 crore covering 60 units. It is proposed to strengthen 5 Eri SSPCs under the Central Silk Board and strengthen 50 Eri Farm-cum-Grainages each at a cost of Rs. 5.00 lakh and the total outlay for XI Plan has been kept at Rs. 2.5 crore and the Central Silk Board share is kept at Rs. 2.25 crore since most of the activity is in the north-east.

12.149 Rearing Sheds for Eri Silkworm Rearing: During Tenth Plan, the provisions made in Mulberry sector were utilized for construction of 9,297 rearing houses with Central assistance of Rs. 6.65 crore. Eri rearing is usually done in a small scale. However a small fraction of the rearers do rear more than 100 dfls per batch. It

is therefore proposed to provide 1000 sheds with a unit cost of Rs. 50,000/- at a total cost of Rs. 5.00 crore with the central share fixed at Rs. 2.25 crore.

12.150 Augmentation of Muga Food Plants: During Tenth Plan, against a target of 6500 acres of muga food plants + 2,500 seed rearers, the achievement was 7551 acres of muga food plants + 2,885 seed rearers. The Central assistance kept was Rs. 4.20 crore and the expenditure Rs. 4.85 crore. Considering this, a target of raising 10,000 acres of muga food plants by 4,000 farmers at a total outlay of Rs. 16.60 crore has been set for Eleventh Plan and the CSB share will be Rs. 11.20 crore allowing a 10 percent hike over the previous Plans's costs.

12.151 Support for Muga Seed Production: The target set for Tenth Plan was 800 graineurs with 2500 farmers and the physical achievement was 625 graineurs with 2677 farmers till 2005-06. The allocation was Rs. 5.63 crore and the expenditure Rs. 5.36 crore. To meet the additional seed requirement of 0.25 crore dfls required to meet the silk production target of Eleventh Plan, it is proposed to support 700 Private muga graineurs with 2200 farmers at a cost of Rs. 7.70 crore with a Central share of Rs. 6.90 crore.

12.152 Support to Muga Farm-cum-Grainages: During X Plan 17 units were supported with a central share of Rs. 1.87 crore against a target of 10 farms with the Central support of Rs. 1.24 crore. During XI Plan, it is envisaged to Strengthen 20 units at an outlay of Rs. 3.17 crore including 15 percent escalation over previous Plan. The Central share will be Rs. 2.85 crore.

Post Cocoon Sector:

12.153 Multi-end Reeling Machine: During X Plan it was envisaged to set up 462 units with a Central Share of Rs. 13. 27 crore of which, Rs. 3.18 crore was released towards CSB share in respect of multi-end machines installed during IX Plan. During X Plan only one multi-end machine and 4 Ushnakothis were installed at a cost of Rs. 0.15 crore. However, considering the importance of the machinery in the quality aspect, it is proposed to install the following capacities during XI Plan:

Sl No.	Machineries	Units	No. of Units	Unit Cost (Rs. lakh)	Cost of Machinery (crore Rs.)
1	Slow Speed Multi-end Reeling Machines (20 ends / basin)	18 basins (Equivalent to 36 basins of 10 ends)	50	40.00	20.00
2	Establishment of Multiend reeling machines	10 basins	300	10.00	30.00
		20 basins	100	17.00	17.00
3	Automatic Reeling Machines (Imported)	400 ends	10	100	10.00
	Twisting Units	400 Spindle Cap	100	6.00	6.00
4	Cottage basin*	10 basins	500	1.75	8.75
5	Hot air Drier/ Ushnakothis	50 kg Cap	250	1.00	2.50
		120 kg Cap	250	1.75	4.375
6	Motorizing Charkas		2000	0.078	1.56
7	Dupion Silk Reeling Machine		50	1.00	0.50
	Total:				100.685

12.154 The outlay proposed for XI Plan is Rs. 100.685 crore (Central share- Rs. 42.67 crore). It is also proposed to set up Common Facility Effluent treatment plants at two major yarn / fabric dyeing clusters dovetailing the schemes to the schemes of local bodies / Handloom Department. The Plants are proposed to be operated by the user groups on no profit no loss basis.

12.155 **Interest on Working Capital:** It is proposed to provide interest subsidy for borrowing for working capital from Nationalised Banks. A token provision of Rs. 15.00 crore has been made.

12.156 **Quality Linked Price Support System:** During X Plan 22 states have availed the facility at a total cost of Rs. 17.45 crore against a provision of Rs. 10.00 crore. It is now proposed to provide only the equipment part of this with a target of 25 units at an outlay of Rs. 3.75 crore consisting of the Central share of Rs. 3.75 crore.

12.157 Setting up of Spun Silk Mills for Eri: A target of 4 units at a total outlay of Rs. 4.50 crore was kept in X Plan. Decision was taken in respect of 2 units and there was no expenditure so far. Considering this, it is proposed to continue this scheme during XI Plan with an outlay of Rs. 3.38 crore with a physical target of 3 units and the Central share will be Rs. 2.53 crore.

12.158 Establishment of Cocoon Banks (New Scheme): In the north, eastern and north-eastern regions and in non-mulberry sector, the number of cocoon crops is limited to 2-3 a year. As such the reelers have to invest huge amounts to buy and stock the raw material to continue their reeling activities. It also requires huge storing space for cocoon storage. Hence the scheme is proposed during XI Plan at an outlay of Rs. 7.5 crore. It is targeted to have 10 such units each with drying and storage facilities and working capital to be operated under State Governments / Cooperatives.

12.159 Common Facility Centres for Yarn and Fabric Processing, Design Centres, etc.: It was envisaged to set up 67 CFCs (40 CFCs for yarn Processing and 20 for fabric dyeing and 7 in Vanya sector) at an outlay of Rs. 5.56 crore (CSB share) with a sharing pattern of 75:25 between CSB and beneficiary. There was no progress during the X Plan. The units have a fixed package with all the equipment built in. It is suggested to treat each unit's requirements on case-to-case basis so that only required equipment is procured. It is therefore proposed to continue the scheme during XI Plan with a target of 20 units with the overall outlay of Rs. 3.00 crore. Central Silk Board share will be Rs. 2.25 crore. The schemes will be dovetailed to those of the Departments of Handlooms.

12.160 Incentive for Bivoltine silk reelers: This is an ongoing scheme, which provides an incentive of Rs. 100/- for every kg of raw silk reeled. A provision of Rs. 7.50 crore was made during X Plan covering 1500 MT and the expenditure was Rs. 2.89 crore. To cover the envisaged production of 5000 MT of Bivoltine raw silk, extending the scheme to XI Plan, a provision of Rs. 50.00 crore to be met entirely from CSB.

12.161 Upgrading Handlooms: A target of upgrading 1,000 looms was set at a cost of Rs. 1.38 crore during X Plan. There was no achievement. However, considering the importance of handlooms and the need for quality, a token provision of Rs. 1.00 crore with a target of 725 is kept for XI Plan. The target is expandable by dovetailing

the schemes with those of the Handloom Departments and other local schemes. Efforts would be made to make use of existing design centres and the training and skill development centres by the handloom sector for creation of products.

12.162 Providing Services of Master Reelers/Weavers/Dyers to States: Rs. 0.50 crore was kept for this during X Plan with a physical target of 50 nos and only 25 nos were utilized with an expenditure of Rs. 0.06 crore. It is therefore proposed to keep a token provision of Rs. 0.25 crore with a physical target of 100 during XI Plan.

12.163 Support to Non-Mulberry Reeling Devices: During X Plan it was proposed to install 3000 Nos of reeling devices and 7500 spinning devices with CSB share of Rs. 2.97 crore and the achievement was 1976 nos + 3027 at Central Silk Board's expenditure of Rs. 1.57 crore. During XI Plan, it is proposed to set up 1,500 reeling units with a unit price of Rs. 16,000/- and 5,000 spinning units with a unit price of Rs. 2,500/- is proposed. The Proposed outlay is Rs. 3.65 crore and the Central share is Rs. 2.00 crore.

12.164 Support for Bye-product utilization: The scheme was approved in March 2006 with a target of 10 units at an outlay of Rs. 1.40 crore and is yet to take off. Initially 14 units (7 in mulberry + 7 in non-mulberry) were approved with 100 percent assistance. It is expected to facilitate Entrepreneurs to efficiently utilize the pupae and silk waste not only to increase their profitability but also to remove pollution in the production units. It is proposed to continue in XI Plan with 10 units at a total outlay of Rs. 1.40 crore and Central assistance of Rs. 1.40 crore.

12.165 Enterprise Promotion and Training: A target of 65 programmes (50+15) was set during X Plan with an outlay of Rs. 1.10 crore. Trained 52 batches incurring Rs. 0.70 crore. The Same target is set for XI Plan with an outlay of Rs. 0.75 crore. The budget for conducting training / skill development programmes is included in R&D budget. Additional training programmes can be dovetailed with Government of India Schemes like STEP, local schemes and those from other funding agencies.

12.166 Extension and Publicity Material in Local Languages: A Central assistance of Rs. 1.50 crore was earmarked during X Plan and the expenditure upto 2005-06 was Rs. 1.99 crore. A financial outlay of Rs. 5.00 crore is kept in the XI Plan all with Central assistance.

12.167 Vanya Silk Market Promotion Cell: The Vanya Silk Market Promotion Cell has been constituted at the CSB headquarters in 2006-07 with a financial outlay of Rs. 3.05 crore (Rs. 0.45 Procuring samples of raw materials / finished products etc.; Rs. 0.35 crore towards Consultancy charges; Rs. 0.75 crore for Printing & Publicity; and Rs. 1.50 crore for Participation in marketing events) during X Plan. The scheme is aimed at popularizing the Vanya silk products in the National and International Markets by way of publicity, organizing and participation in exhibitions, expos, buyer seller meets, etc. and sponsoring the artisans and manufacturers for participation in such events. Therefore this needs to be continued further during XI Plan and proposed an outlay of Rs. 5.0 crore.

12.168 Product Design and Development: A Product Design and Development Cell have been set up at the CSB Headquarters recently to promote design development through professionals. A token provision of Rs. 2.00 crore has been made for this purpose.

12.169 Assistance for Testing Facilities in Public / Private Grainages (New Scheme): In view of passing of the 'Central Silk Board Act Amendment Bill', it becomes mandatory for all the silkworm seed production units to update their testing facilities to reach the quality standards. A **new scheme** is therefore proposed to assist the existing public and private seed production units in procuring seed testing equipment up to a Maximum of Rs. 2.5 lakh. It is proposed to cover 400 units during XI Plan with a total outlay of Rs. 10.00 crore. The Central share was kept at Rs. 7.00 crore.

12.170 Administrative Expenses for Project Implementation: A token provision of Rs. 15.00 crore is kept for the Coop. Soc. / NGOs / other Developmental Institutions (Excluding DoS & CSB) towards administrative costs for running the developmental projects at 5 percent of the project cost.

12.171 Special Schemes on Gender Related Issues (New): It is proposed that 30 percent of the schemes under CDP should orient towards women. In addition, it is proposed to formulate special projects for women particularly in training, organizing group activities like reeling, spinning, weaving, and other value addition activities like making silk products, etc. A token provision of Rs. 8.53 crore has been made

during the XI Plan. Most of the activities will be dovetailed to the existing CDP schemes as well as other schemes of Government of India, micro-financing, etc.

12.172 Special Emphasis on Tribal Areas (New): Special schemes will be taken up under Tribal Sub Plan (TSP) particularly in Non-Mulberry sector, which is a major activity of tribals. The schemes will be dovetailed to the schemes of the Ministry of Tribal Affairs, Ministry of Rural Development, etc. Cultivation of silkworm food plants will be dovetailed to the schemes like Water Shed Management, Rain Water Harvesting and Water Saving Practices, etc. The Voluntary Organisations working on the upliftment of the STs will be encouraged. In addition, a token Provision of Rs. 1.00 crore has been kept for the XI plan for group activities and give them exposure to the sericulture activities in the developed areas.

12.173 IT – Initiatives: An outlay of Rs. 2.5 crore was kept during X Plan while the expenditure upto 2005-06 was Rs. 0.50 crore. Considering this, a token provision of Rs. 3.00 crore has been made in the XI Plan only to take up activities promoting silk production and related activities.

12.174 Quality Certification Systems: This includes testing facilities for seed, cocoon, silk, fabric, etc.

- **Support for Cocoon Testing Units:** During X Plan, a central share of Rs. 1.26 crore was set aside to support supply of 500 units of cocoon quality grading equipment. Only 3 equipment were procured at an expenditure of Rs. 0.02 crore from Central Silk Board. Considering this and the requests made by reelers, it is proposed to make a token provision of Rs. 0.25 crore with a physical target of 100 units during XI Plan.
- **Support for Raw Silk Testing:** During X Plan, an allocation of Rs. 1.50 crore (Central share) has been made to provide raw silk testing equipment to 300 units and the achievement was only 1 unit and the expenditure on Central share is Rs. 0.01 crore. Considering this, **it is suggested to drop this component.**
- **Promotion of Silk Mark (SMOI):** A one time assistance of Rs. 6.00 crore has been given in X Plan. The expenditure up to 2005-06 was Rs. 0.99 crore. A token provision of Rs. 10.00 crore has been kept for XI Plan. It should be geared up to earn its resources by reorganizing its activities.

Research and Development / Institutional Training / Extension:

12.175 The CSB has 9 major R&D Institutions with a network of Regional Stations and Research Extension Centres and their sub-units. The approved outlay for these units during X Plan was Rs. 207.35 crore. The actual Expenditure during the first four years was Rs. 169.32 crore and the likely expenditure during X Plan is Rs. 215.00 crore. In addition, it is proposed to establish a Regional Silk Technological Research Station in Guwahati, to cater to the needs of North Eastern Region, a Regional Eri Research Station outside the N.E. region to cater to the needs of non-traditional States with a token provision of Rs. 5.0 crore each and Rs. 1.00 crore each for strengthening of the Central Tasar Research and Training Institute, Ranchi and Central Muga & Eri Research and Training Institute Ladoigarh, Assam. CSB has taken an initiative to extend the knowledge base on sericulture through 'Distant Education Mode' in collaboration with IGNOU, New Delhi on equal sharing pattern. This would need a provision of Rs. 2.00 crore. R&D component also includes Product Design and development activities. Thus considering a 15 percent hike in the expenditure and the additionalities, proposed an outlay of Rs. 262.00 crore for the XI Plan. In addition, a token provision of Rs. 3.50 crore is kept for survey of potential areas using Remote Sensing technology to identify the potential areas for sericulture for planning and development; and Rs. 1.0 crore for working on disease forecasting and forewarning systems in collaboration with Centre for Rural Development and Industrial Agency. Thus the total for R&D for XI Plan works out to Rs. 266.50 crore.

Seed Organization/Technical Assistance/Field Level Training:

12.176 The seed Organisations under Central Silk Board also undertake certain amount of extension and field training activities for the seed cocoon growers and the private seed producers. The allocation for X Plan was Rs. 14.22 crore and the actual expenditure for the first 4 years is Rs. 11.22 and is likely to cross the allocation. Considering 15 percent hike in expenditure an outlay of Rs. 16.50 crore has been proposed for XI Plan.

Central Silk Board Administration:

12.177 The Central Silk Board has a number of Regional Offices and Regional Development Offices, Certification Centres, Raw Material Banks, etc. coordinating various State Specific Programmes. CSB also organizes Entrepreneurship Development Programmes etc., besides organizing the meetings of the Board, Standing Committee, Research Coordination Committee, and various other meetings, organize workshops seminars, etc. During X Plan, an outlay of Rs. 42.01 crore has been kept and the expenditure during the first four years was Rs. 23.45 crore and is likely to touch Rs. 30.00 crore. As such a token provision of Rs. 30 crore has been kept for XI Plan.

Shifting of expenditure under Salaries and Other Committed Expenses from Plan to Non-Plan during XI Plan:

12.178 The expenditure on some of the schemes and maintenance of various units is now required to be shifted from plan to non-plan. Several units like Regional Research Stations both under mulberry and non-mulberry / Silk Conditioning and Testing Houses / Demonstration-cum-Training Centres, etc. working under different CSRTIs /CTR&TI/CSTRI and carrying out the applied research in the field are to be brought under non-plan. The Basic Seed Farms are engaged in production of basic seed for the DoS and farmers. Their recurring expenditure on maintenance is to be shifted from plan to non-plan. A proposal has been sent to Ministry to this effect during March 2006.

12.179 Cluster Development, Contract Farming, Cooperative Farming, Special SGSY Projects, Scheme of Fund for Regeneration of Traditional Industries; etc. are the approaches requiring the same inputs provided under various schemes which are to be pooled according to the necessity and build up into a project and hence no separate provisions are required. However, a special provision of Rs. 6.00 crore is made to cover the expenditure for which provisions may not be available under CDP.

North East Region:

12.180 The overall outlay during X Plan was Rs. 86.50 crore and the expenditure was Rs. 91.47 crore till July 2006. Developmental schemes (mostly under CDP) with an approximate outlay of Rs. 85.00 crore are almost exclusively oriented towards the

North Eastern region of which the Central share will be Rs. 60 crore. In addition it will get another Rs. 35.00 crore from other heads totaling to Rs. 95.00 crore from CSB during XI Plan.

12.181 There is an increase in the XI Plan Projections by around 92 percent. The factors contributing to the increase are:

- i. During Tenth Plan there was hardly any effort to raise the silkworm food plants to expand the production base and the expenditure from CSB was Rs. 18.72 crore. During Eleventh Plan, it was envisaged to bring about 72000 Ha of area under food plants at an estimated cost of Rs. 174.33 crore including Drip System and Vermi-compost sheds (Central Share: Rs. 81.27 crore) which makes a big difference but absolutely essential to reach the targets. Training and start up tools for all the new rearers and other stakeholders proportionately adds to the increase in allocation.
- ii. Provisions made for rearing house for all the 1, 27,500 new rearers, which works out to. Rs. 790.5 crore (CSB's Rs. 237.00 crore). This is an essential requirement without which silkworm rearing cannot be done.
- iii. Proportionate to the expansion of area under food plants, the seed production also required to be strengthened. This costs around Rs. 104 crore (Central share Rs. 53.00 crore).
- iv. Automatic and multi-end reeling machinery and other machinery costs Rs. 100.685 crore (CSB share: Rs. 42.67 crore). This is essential to maintain the quality of the yarn at international standards.
- v. Incentive for Bivoltine Silk Reelers comes to Rs. 50.00 crore. This scheme has been continued from X Plan and required till stabilization of Bivoltine silk production.
- vi. About 22 percent increase in the R&D sector over the X Plan allocation/expenditure is due to the increased training activity to train the extension functionaries, setting up two Regional Research Stations in Non-mulberry sector and new initiatives in new areas of research, technology refinement and transfer of technology.

12.182 Thus, the allocations have been worked backwards from the targets, keeping a marginal increase up to a maximum of 15 percent as cost escalations on a few select items and hence reasonable.

12.183 The credit requirement will be of the order of around Rs. 500.00 crore, which can be easily provided by the banking system. It is proposed that the subsidy be linked to credit and the local administration and the banks be involved as the partners for the developmental activity.

12.184 A credit-cum-subsidy scheme for raising silkworm food plants, silkworm rearing, reeling, etc. may be operationalised during XI Plan period and the subsidy component be routed through NABARD as a nodal agency. Further, Government of India may consider subventing the ultimate lending rates by banks for this sector suitably so that the beneficiaries of sericulture sector get credit at concessional rate say 7 percent p.a. (as has been done for crop lending for farmers). Further, it is proposed to dovetail the schemes to the State Specific schemes in operation, schemes from Ministry of Rural Development, Ministry of Agriculture, Ministry of Forestry and Environment and other such Departments.

Abstract:

12.185 The outlay and Expenditure in X Plan and the projections for XI Plan are given below:

(Rs. crore)

Item	<u>X Plan Outlay (Central Share)</u>	Expenditure up to July 06	XI Plan Projections	Central Share
Research & Development	207.35	186.08	266.50	266.50
Seed Support	14.23	10.92	16.50	16.50
CSB Administration	42.01	26.04	30.00	30.00
CDP	244.46	200.90	1565.12	686.215
IT	10.00	0.84	3.00	3.00
Quality Certification Systems including SMOI	7.85	1.37	10.25	10.25
UNDP	1.09	3.94	0.00	0.00
Total	526.99*	430.09	1891.37	1012.47

* Includes EFC sanctions of Rs. 76.99 crore (CDP 63.49; IT-7.5; QCS- 6.0)