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RESEARCH PAPER

Agribusiness potential of sericulture in Karnataka

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ABSTRACT

Sericulture is a cottage based industry which combines both the features of agriculture and industry. India has tremendous potential for silk development but yet unexploited, however, development is not far away. It is one of the major employment generating sectors in the state and its growth has immense employment generation potential, particularly in rural Karnataka. This studyis an attempt to analyze the agribusiness potential of sericulture in Karnataka. The study explored that there is a huge improvement in area, production and also employment from 2008-09 to 2015-16. The cultivated area was only 177943 hectares in 2008-09, which has improved over the years and has reached 208947 hectares in 2015-16 with a compound annual growth rate of 2 per cent. Similarly, the production in Karnataka was also increased from 5949MT in 2003-04 to 9645MT in 2014-15 with CAGR of 4 per cent. 27 per cent of the families of Karnataka are contributing to the total families engaged in Indian sericulture industry. In the year 2014-15, earnings from export were about Rs.2829.94 crore but it was reduced to Rs.2495.99 crore in the year 2015-16. The import earnings during the year 2015-16 was Rs.1389.10 crore. Hence, it is revealed from the study that sericulture has a very high employment potential. It is the biggest employer in the country only next to handloom industry. It is ideally suited to generate jobs in the rural areas and particularly in the drought prone areas.Sericulture gains added importance in the context of growing unemployment, both disguised and seasonal. Most of the farmers in India are poor and are not employed throughout the year. Sericulture can provide subsidiary employment to such farmers and augment their in comes.

KEY WORDS : Sericulture, CAGR, Employment potential

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Silk has been intermingled with the life and culture of the Indians. Man is always inquisitive for silk products. Silk - The queen of textiles spells luxury, elegance, class and comfort. Mankind has always loved this shimmering fibre from the moment the Chinese Empress Shiling Ti discovered it. Silk is a high value but low volume product accounting for only 0.2 per cent of world's total textile production. Silk production is regarded as an important tool for economic development of a country as it is a labour intensive and high income generating industry that churns out value added products of economic importance. The developing countries rely on it for employment generation, especially in rural sector and also as a means to earn the foreign exchange. Geographically, Asia is the main producer of silk in the world and produces over 95 per cent of the total global

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output. Though there are over 40 countries on the world map of silk, bulk of it is produced in China and India, followed by Japan, Brazil and Korea. China is the leading supplier of silk to the world.

India is the second largest producer of silk and also the largest consumer of silk in the world. It has a strong tradition and culture bound domestic market of silk. In India, mulberry silk is produced mainly in the states of Karnataka, Andhra Pradesh, Tamil Nadu, Jammu and Kashmir and West Bengal, while the non-mulberry silks are produced in Jharkhand, Chhattisgarh, Orissa and north-eastern states.

There are five major types of silk of commercial importance, which are, mulberry, oak tasar and tropical tasar, muga and eri silk. Except mulberry, other non-mulberry varieties of silks are generally termed as vanya silks. India has the unique distinction of producing all these commercial varieties of silk.

What is sericulture?

Sericulture is an agro-based industry. It involves rearing of silkworms for the production of raw silk, which is the yarn obtained out of cocoons spun by certain species of insects. The major activities of sericulture comprises of food-plant cultivation to feed the silkworms which spin silk cocoons and reeling the cocoons for unwinding the silk filament for value added benefits such as processing and weaving.

Why Sericulture?

In India, about 60 lakh persons are engaged in various sericulture activities, which generate employment at 11 man days per kg of raw silk production (in on-farm and off-farm activities) throughout the year. This potential is par-excellence and no other industry generates this kind of employment, especially in rural areas, hence, sericulture is used as a tool for rural reconstruction.

It acts as an important agribusiness firm, as about 57 per cent of the gross value of silk fabrics flows back to the cocoon growers with share of income to different groups. It should be noted that, about 56.8 per cent income goes to cocoon growers, 6.8 per cent to the reelers, 9.1 per cent to the twisters, 10.7 per cent to the weavers and 16.6 per cent to the traders. Thus, large chunk of income goes back to the villages from the cities. In order to undertake mulberry cultivation and silkworm rearing in one acre of irrigated land, estimated investments of Rs.12,000 to 15,000 (excluding cost of land and rearing space) is sufficient. Besides, by adopting stipulated package of practices, a farmer could attain net income levels upto Rs. 30000 per acre per annum. Moreover, women constitute over 60 per cent of those employed in down-stream activities of sericulture in the country, which is possible because sericulture activities starting from mulberry garden management, leaf harvesting and silkworm rearing is more effectively taken up by the women folk. Even silk reeling industry including weaving is largely supported by them. In addition,as the end-product users are mostly from the higher economic groups, the money flows from high end groups to low end groups. Ultimately, benefits of sectorial value-addition primarily accrue to rural households. Cases of landless families engaged in cocoon production using mulberry contracted from local farmers are common in some states.

Objectives of the study :

The overall objective of this study is to analyze whether there is anagribusiness potential for sericulture in Karnataka. The specific objectives are :

- To analyze the trend in area, production and employment in mulberry sericulture in India over the years.
- To examine the growth in consumption of silk in India.
- To assess the number of families engaged in sericulture in Karnataka.

METHODOLOGY

The compound growth rates in area, production and employment were estimated from the time series data for the period from 2003-04 to 2015-16, collected from various journals and e-resources.

The following analytical tool was used to estimate the growth rates (Nethrayani, 2013).

$$Y_t = A\, B_t V_t \quad \ldots (1)$$

where,

Y_t = Area, production and productivity in the year t

A = Intercept indicating Y in the base period (t= 0)

B = 1 + g

t = Time period

V_t = Random disturbance term

Eq. (1) was converted into the logarithmic form as follows to make it in a linear form:

$$\ln Yt = \ln A + t * \ln B + \ln V_t$$

This is of the following form :

$$Qt = a + bt + U_t \quad .....(2)$$

where,

Qt = ln Y

a = ln A

b = ln B

Ut = ln V_t

The values of 'a' and 'b' were estimated by using ordinary least squares estimation technique. Later, the original 'A' and 'B' parameters in eq. (1) were obtained by taking antilogarithms of 'a' and 'b' values as:

A = Antilog (a)

B = Antilog (b)

Average annual compound growth rate (%) was calculated as follows:

$$g = (B - 1) * 100$$

ANALYSIS AND DISCUSSION

Table 1 depicts the status of area, production and employment in sericulture industry in India from 2008-09 to 2015-16. It can be observed from the Table 1 that there is a huge improvement in area, production and also employment from 2008-09 to 2015-16. The cultivated area was only 177943 hectares in 2008-09, which has improved over the years and has reached 208947 hectares in 2015-16 with a compound annual growth rate of 2 per cent. In addition to the cultivated area, production has also show an improvement 18370 MT in 2008-09 to about 28523 MT in 2015-16 with an improved CAGR of 6 per cent. Similarly, the growth in employment has also increased over the years. Between the years (1950-51 to 2015-16) the CAGR of productivity is about 3 per cent and at present, the employment rate is about 83 Lakh persons which were only 63 Lakh in 2008-09. It should be noted that the maximum production was observed in the year 2015-15 which was about 28708 MT.

Table 2 portrays the production of raw mulberry silk in India and Karnataka from 2003-04 to 2014-15. It can be understood from the table that Karnataka is the leading producer of raw mulberry silk in India over many

Table 1 : Area, production and employment in sericulture industry in India from 2008-09 to 2015-16

Year	Area (ha.)	Production (MT)	Employment (Lakh persons)
2008-09	177943	18370	63
2009-10	183773	19690	68
2010-11	170314	20410	72
2011-12	181089	23060	75
2012-13	186015	23679	76
2013-14	203023	26480	78
2014-15	219819	28708	80
2015-16	208947	28523	82
CAGR (%)	2	6	3

Source: Department of sericulture, Karnataka

Table 2 : Production of raw mulberry silk in India and Karnataka from 2003-04 to 2014-15

States	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	CAGR
Karnataka	5949	7302	7471	7883	8240	7238	7360	7338	7796	8219	8574	9645	4%
AP	6054	5084	5375	5526	4485	4492	5119	5161	6447	6550	6911	6485	1%
West Bengal	1453	1520	1552	1598	1660	1809	1865	1885	1924	2018	2029	2450	5%
Tamil Nadu	285	443	739	1125	1368	1411	1233	1182	1418	1185	1120	1602	17%
Manipur	27	54	48	70	80	96	102	97	84	114	129	150	17%
MP	9	14	23	30	50	96	95	104	85	105	108	187	32%
UP	9	10	19	25	30	42	61	85.8	87	124	155	186	32%
Uttarakhand	9	9	14	14	15	17	14	20	14	17	18	29	11%
Others	6124	7486	7675	8137	8557	7647	7833	7825	8213	8602	9006	10301	5%
India	13970	14620	15445	16525	16245	15610	16322	16360	18272	18715	19476	21390	4%

Source: Ministry of Textiles, Govt. of India. (ON512), (ON939)

years compared to any other states. It can also be depicted from the table that there is a huge improvement in the production of mulberry silk in India and Karnataka from 2003-04 to 2014-15. Despite fluctuations in growth, the production of mulberry silk in India has improved over the years from 13970 MT in 2003-04 to 21390 MT in 2014-15 with a compound annual growth rate of 4 per cent. Similarly, the production in Karnataka was also increased from 5949 MT in 2003-04 to 9645 MT in 2014-15 with CAGR of 4 per cent. It should be noted that the maximum production was observed in the year 2014-15 which was about 9645 MT in case of Karnataka and 21390 MT in case of India.

Consumption of silk in India from 2011 to 2014 has been presented in Table 3. There is an improvement in quantity of silk consumed in India. Consumption of silk has increased from 28743 MT in 2011-12 to 29739 MT in 2013-14. It is clear from the table that the consumption of silk in India is increasing over the years.

The Table 4 exposes the state wise number of families engaged in sericulture industry in India. It could be observed from the table that large number of families

Table 3 : Consumption of silk in India from 2011 to 2014

Sr.No.	Year	Consumption (MT)
1.	2011-12	28743
2.	2012-13	28638
3.	2013-14	29739

Source: Lok Sabha Unstarred Question No. 533, dated on 26.02.2015

Table 4 : State wise number of families engaged in sericulture industry in India (2015)

States	Mulberry	Tasar	Eri	Muga	Total	% share to India
Andhra Pradesh	117000	3000	565	-	120565	13
Arunachal Pradesh	770	110	3410	3930	8220	1
Assam	31731	-	182991	37434	252156	26
Bihar	1250	50	500	-	1800	0
Chhattisgarh	807	14237	184	-	15228	2
Haryana	45	-	-	-	45	0
Himachal Pradesh	7000	-	-	-	7000	1
Jammu and Kashmir	26600	400	-	-	27000	3
Jharkhand	320	64680	-	-	65000	7
Karnataka	132205(27%)	-	-	-	132205	14
Madhya Pradesh	24148	12850	264	-	37262	4
Maharashtra	4955	156	-	-	5111	1
Manipur	2500	2229	23500	500	28729	3
Meghalaya	1368	-	26472	160	28000	3
Mizoram	2500	650	7200	1650	12000	1
Nagaland	1825	330	10998	515	13668	1
Odisa	1400	43560	1868	-	46828	5
Punjab	1012	-	-	-	1012	0
Sikkim	189	-	160	44	393	0
Tamil Nadu	23691	-	-	-	23691	2
Tripura	5000	-	-	-	5000	1
Uttar Pradesh	5400	722	900	-	7022	1
Uttarakhand	3625	50	-	50	3725	0
West Bengal	94250	17087	3443	1508	116288	12
India	489591	160111	262455	45791	957948	

Source: Indiastat

(132205) from Karnataka is engaged in mulberry sericulture followed by Andhra Pradesh. About 64680 families of Jharkhand is involved in tasar silk production, 182991 families from Assam is engaged in eri silk production and 37434 families from Assam is involved in Muga silk production. The total number of families involved in sericulture in India is about 957948 in which Assam contributes major share of 26 per cent. Nearly 489591 families are in mulberry sericulture industry in India where the major share is from the state of Karnataka (27%).

Table 5 elucidates export earnings of silk and silk goods from 2010-11 to 2015-16. It could be shown from the table that the total export earnings of silk and silk goods were fluctuating over the years. Higher total earnings was observed (2863.76) in the year 2010-11. In the year 2014-15, earnings from export were about 2829.94 but it was reduced to 2495.99 in the year 2015-16.

Table 6 expounds import details of silk and silk goods from 2010-11 to 2015-16. It could be shown from the table that the total import earnings of silk and silk goods were fluctuating over the years. Higher total earnings was observed (1749.10) in the year 2010-11. The import earnings during the year 2015-16 was 1389.10.

Findings of the study :

The study revealed that, there is a significant improvement in the area, production and employment in sericulture in India over the years. The increase in employment opportunities shows the potential of the country in sericulture. Karnataka is the leading producer of raw mulberry silk in India over many years compared to any other states. Despite fluctuations in growth, the production of mulberry silkin Karnataka has improved over the years from 2003-04 to 2014-15. Majority of the families from Karnataka is engaged in Mulberry sericulture other than tasar, eri and muga. In the year 2014-15, earnings from export were about Rs. 2829.94 crore but it was reduced to Rs. 2495.99 crore in the year 2015-16.The import earnings during the year 2015-16 was Rs.1389.10 crore.

Conclusion :

Sericulture has a very high employment potential. It is the biggest employer in the country only next to handloom industry. It is ideally suited to generate jobs in the rural areas and particularly in the drought prone areas.

Table 5 : Export earnings of silk and silk goods

Items	Crore (Rs.)					
	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Raw silk	2.37	2.58	2.90	4.49	0.69	1.43
Silk yarn	37.01	17.10	19.06	31.76	24.71	28.89
Fabrics and made-ups	2083.82	1497.97	1410.31	1455.63	1465.44	1280.60
Readymade garments	683.32	765.83	787.15	874.00	1214.01	1078.39
Silk carpet	21.10	20.08	21.14	15.71	15.97	16.88
Silk waste	36.14	49.77	62.97	99.30	109.12	89.80
Total	2863.76	2353.33	2303.53	2480.89	2829.94	2495.99

Source:MSFTI, DGCI and S, Kolkata

Table 6 : Import details of silk and silk goods

Items	Crore (Rs.)					
	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Raw silk	927.59	1111.53	1238.56	896.44	970.62	1006.16
Silk yarn	203.46	105.13	80.26	100.07	103.78	81.66
Fabrics and made-ups	602.09	438.53	377.38	315.11	239.01	249.46
Readymade garments	7.10	10.42	9.74	16.08	18.20	15.00
Silk carpet	1.43	1.57	2.89	0.56	0.43	0.05
Silk waste	7.43	8.87	17.25	28.96	25.91	36.77
Total	1749.10	1676.05	1726.08	1357.22	1358.15	1389.10

Source:MSFTI, DGCI and S, Kolkata

Of the 6.29 lakh villages in India, sericulture is practiced in about 59000 villages. It provides part time and full time employment to 60 lakh people in the country and Karnataka's shareis more than 18 lakh people. Nearly 30 per cent of the people in sericulture belong to the weaker sections of society and also the backward and tribal populations in India. Women account for 60 per cent of those employed in the sector.

Sericulture gains added importance in the context of growing unemployment, both disguised and seasonal. Most of the farmers in India are poor and are not employed throughout the year. Sericulture can provide subsidiary employment to such farmers and augment their incomes. Since it is possible to raise five to six crops all throughout the year, mulberry cultivation and rearing of silkworms offer employmentall-round the year. It offers employment to women, children, old and handicapped members of the family. Besides providing direct and gainful employment to those already engaged in sericulture, it provides ancillary job opportunities to village artisans like basket weavers, carpenters, silk-reelers, weavers etc. The bye-product of sericulture opens up another avenue for employment. In addition, silk reeling and marketing, construction of irrigation works, construction and repair of rearing houses and expansion etc. add to the multiplier effect of sericulture. There is a backward and forward linkage of employment which enhances its tremendous multiplier effect.

As compared to most agricultural occupations, sericulture is ahighly labour intensive occupation. It has the lowest investment employment-ratio. More jobs could be created per unit of capital invested. Research studies indicate that the labour requirement peracre of mulberry cultivation and rearing of worms works out to man-days. The family labour accounts for 60 per cent of the total labour employed in cocoon production. Another report estimates that a hectare of irrigated mulberry cultivation with worm-rearing generates 1885 man-days of employment. The labour input per acre insericulture as compared to other competing crops is many times more. Mulberry cultivation absorbs nearly two and half times more labour than paddy cultivation and four and half times more labour than groundnut cultivation. A study made by the Central Silk Board states that one hectare of irrigated sericulture provides full employment to two families of ten persons.

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