



International Journal of Humanities & Social Science Studies (IJHSSS)
A Peer-Reviewed Bi-monthly Bi-lingual Research Journal
ISSN: 2349-6959 (Online), ISSN: 2349-6711 (Print)
ISJN: A4372-3142 (Online) ISJN: A4372-3143 (Print)
UGC Approved Journal (SL NO. 2800)
Volume-III, Issue-VI, May 2017, Page No. 164-173
Published by Scholar Publications, Karimganj, Assam, India, 788711
Website: <http://www.ijhsss.com>

Growth Pattern in Raw Silk Production and Employment Generation in Sericulture in Assam: An Economic Analysis

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Abstract

Sericulture is recognized as one of the most promising and ideally suited agro-based labour intensive cottage industry that plays an important role in socio-economic development of rural masses of Assam providing gainful employment opportunities to poor, small, marginal farmers and agricultural labourers with minimum investment and profitable return within a short gestation period. There are limited studies on sericulture in North Eastern Region (NER) of India in general and Assam in particular. Keeping this in view, this paper attempts to study the pattern of the growth in raw silk production and employment generation in sericulture in Assam during 1997-98 and 2013-14. The study reveals that growth rates both in raw silk production and employment generation are not smooth and continuous rather these are fluctuating over the years. Even in some years, the growth rates show negative trend. In terms of growth rate of various sub-components of raw silk production, eri (0.14) occupies highest followed by mulberry (0.09) and muga (0.06). The growth rate of employment generation has been found highest in muga activity (0.10) followed by mulberry (0.04) and eri (0.02).

Keywords: Sericulture, raw silk, employment, NER, Assam.

Introduction: Sericulture, the technique of silk production, is an agro based labour intensive cottage industry providing gainful employment and generation of income to weaker sections of people in the rural and semi urban areas of Assam. Since its discovery, sericulture has been playing an important role in the socio-economic life of the people. Sericulture as a whole involves a series of economic activities like cultivation of silkworm food plants, seed production and rearing of silkworm for production of cocoons. The post cocoon activities involve reeling/spinning, twisting, dyeing, weaving, printing, finishing and processing of silk fabrics. Some unique features of the silk sector are its rural nature, agro based, ecologically and economically sustainable activity for the poor, small and marginal

farmers, agriculture labour and women in particular. Many studies indicate that 60 percent of the activities in the pre-cocoon and post-cocoon sectors are carried out by women.

Review of literature: Choudhury (1992) in his study deals extensively with the origin of sericulture, its economies and sericulture technology. He is of the view that for the technical improvement in sericulture, several viewpoints have to be taken into consideration, i.e. biology, agronomy, technology, economics, etc. Among these, the knowledge of biology of the silkworm is very essential.

Narasimhanna (1988) emphasizes the need of quality silk worm seed cocoons and standards to be followed in production of silk worm egg on which stability and success of sericulture depends. He is of the view that sound seed would be required for sound sericulture.

Srivastav *et al.* (2005) state that India has indeed become second largest producer of silk since 1987, yet, it imported approximately 7000 mt. raw silk though it produced 15,214 mt. raw silk during 1998-2000. The production was 15900 mt. while internal demand of raw silk was 23300 mt. during 2001. The trends indicate that the gap between demand and supply of silk in India will continue to increase in future due to customary saree culture which may be encased by proper planning and management. Availability of cheap labour in India is an additional advantage to bring it at the top of the global sericultural map.

Anitha *et al.* (2013) in their study observed that women form more than 60 percent of the total workforce engage in sericulture and 80 percent of silk is consumed by them. Thus they stated that sericulture is by the women and for the women. It can generate employment up to 11 persons for every kg of raw silk produced, out of which more than 6 persons are women. They again estimated that out of the total sample of 125 women sericulture entrepreneurial farmers, 24 percent of the respondents earn between Rs. 20,001 and Rs. 25,000 per month followed by 22 percent of the respondents earning Rs. 10,001 and Rs. 15,000 per month from sericulture.

Pandey (2003) in his study observes that the silk industry in Assam is one of the major contributors to state revenue. It is also a major source of employment particularly in rural areas. Eri contributes Rs. 31.5 crore, whereas muga contributes Rs. 40 crore, pat silk contributes Rs. 120 crore out of a total of Rs. 190 crore generated annually through the silk industry in Assam.

Kakati (2006) has estimated that the sericulture industry generates employment for 13 persons per hectare per year out of which 60 per cent are women because of the nature of works involved such as harvesting of leaves, rearing of silk worms, spinning, reeling and weaving.

De *et al.* (2007) in their study have observed that about Rs.1411.25 is generated from each kilogram of cocoon. Therefore, if (as observed from the sample) one third of the produced cocoon is processed, total revenue generated by the rearers and weavers' families of the state of Assam would be about Rs.24.79 crore, which is not very insignificant at all.

They concluded that the contribution to family income makes the women to be more empowered and independent in the family as well as in the society. Hence, if they are brought under cooperative or self-help group, then they can adopt weaving on a larger scale and can diversify their output through the arrangement of proper training and that will definitely have diverse impact on the condition of the rural poor masses.

Area of the Study: Assam is situated in the North-East region of India – bordering seven States viz. Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and West Bengal and two countries viz. Bangladesh and Bhutan. With a geographical area of 78,438 sq. kms. i.e., about 2.4 percent of the country's total geographical area, Assam provides shelter to 2.57 percent population of the Country. About 86 percent of the total populations of the state live in rural areas against 69 percent of the country as a whole (Economic Survey, Assam, 2014-15).

Assam is well known for its sericulture and weaving practices. The final product 'Silk' occupies a very important place in the life and culture of the people of Assam. The climatic condition of Assam is favourable for sericulture. Sericulture as an enterprise offers a tremendous opportunities for sustainable employment and economic growth of the state. Silk product has a good demand in export market and earns a good amount of foreign money. Being a production and employment oriented industry; it can reshape the rural economy in the state to a great extent.

Objectives of the study:

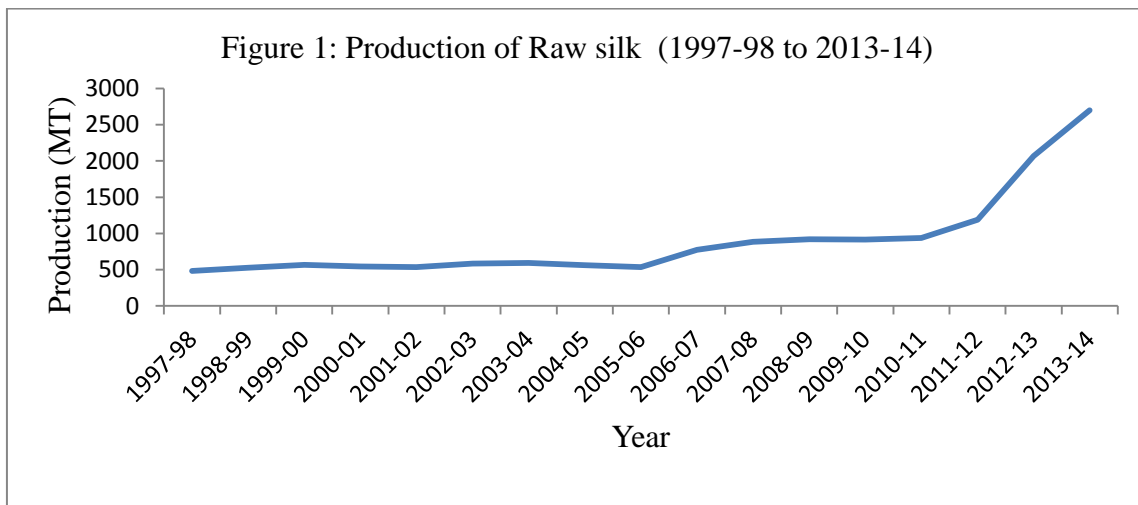
The objectives of the present study are:

1. To study the growth pattern in raw silk production in Assam.
2. To make a comparative study among eri, muga and mulberry raw silk production.
3. To make an assessment on employment generation in sericulture in the state.

Materials and methods: The study is carried out on the basis of secondary sources of information collected from different publications of the Government agencies like Directorate of Economics and Statistics, Government of Assam; Directorate of Sericulture, Government of Assam; Central Silk Board, etc. The period undertaken for the study is from 1997-98 to 2013-14. The statistical tool like ANOVA is used to fulfill the objectives.

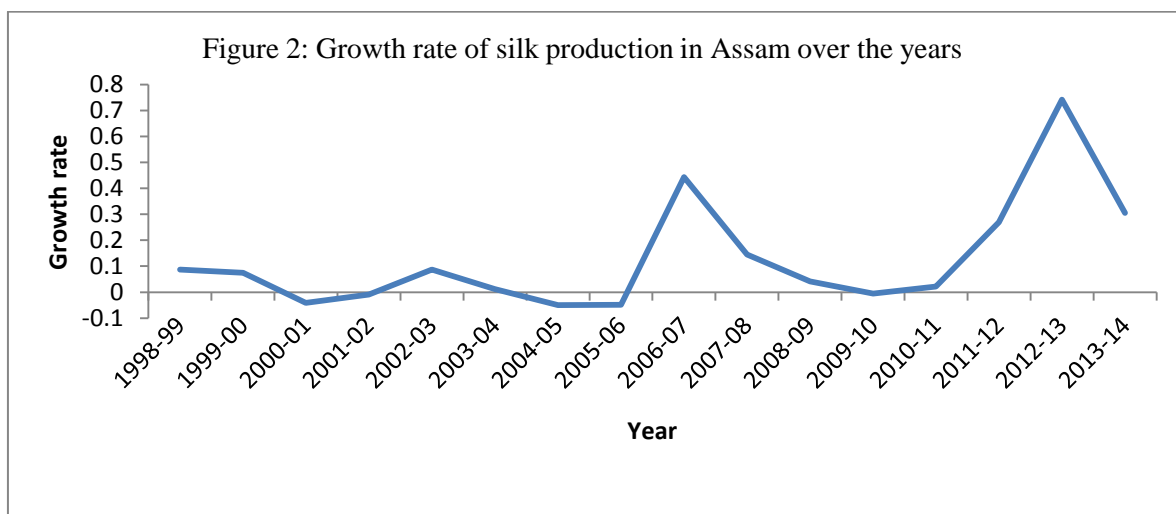
Results and Discussion:

Trend of raw silk production in Assam: Figure 1 outlines the trend line of the production of raw silk since 1997-98 to 2013-14. It reveals that the total production of raw silk has not much increased up to 2005-06. After that period this trend of production has slightly increased up to period 2010-11. However, after that period there is a jump in raw silk production.



Source: Authors' calculation based on the data collected from Department of Sericulture, govt. of Assam.

Thus, the trend line of raw silk production demonstrates that the increase in raw silk production is not smooth rather it is somewhat fluctuating over the years. This fluctuating behavior of raw silk production over the years can be understood through plotting growth rate of raw silk production over the time periods as depicted in the figure 2. It reveals that growth rate of silk production is not in continuous increasing trend. Even in some period of time the growth rate of silk production becomes negative as observed in the year 2000-01, 2005-06 and in 2009-10 as well.



Source: Authors' calculation based on the data collected from Director of Sericulture, govt. of Assam.

Variation in different components of Raw Silk production: Table 1 provides the variation in different components such as Eri, Muga and Mulberry raw silk production in Volume-III, Issue-VI

Assam. It is observed that average total raw silk production is in different time periods is around 901 metric ton (MT) among them Eri constitutes 798.74 MT, Muga 94.56 MT and average production of Mulberry is 13.74 MT. This variation among different components of raw silk production is also found to be statistically significant at 1 percent level. The F-statistics reveals that the model is also fit.

Similarly, column 3 in table 1 shows the average growth rate of different sub-components of raw silk production in different time periods. In terms of growth rate of various sub-components of raw silk production it is observed that growth rate is highest in eri production (0.14) followed by mulberry (0.09) and muga (0.06). However, these differences are not at all statistically significant at any level.

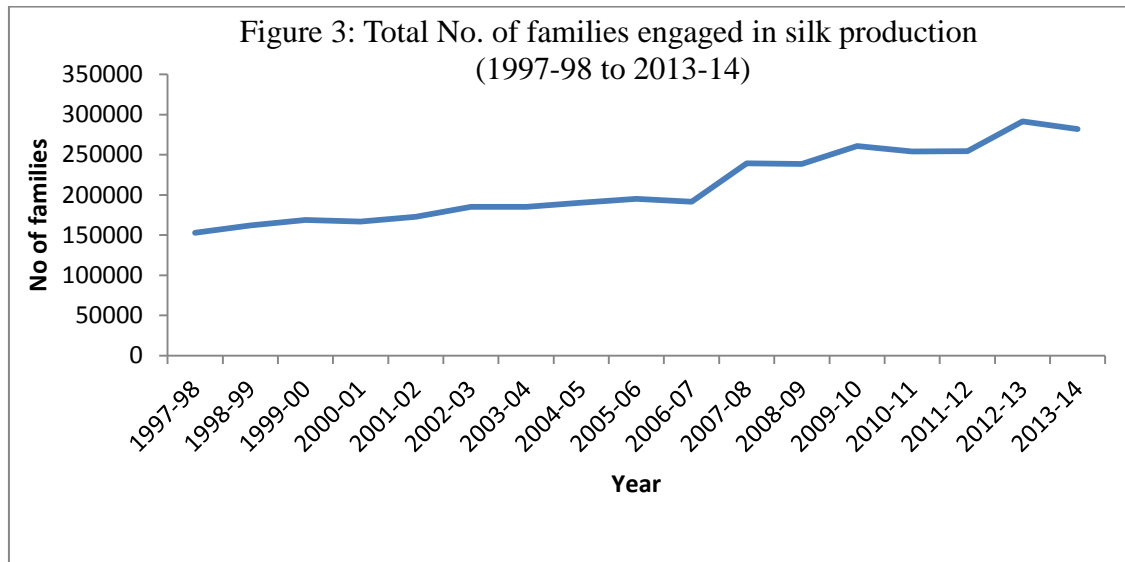
Table 1: Variation in Eri, Muga and Mulberry raw silk production (in MT)

	Average Production	Average growth of Production
Eri	798.74*** (584.46)	0.14 (0.22)
Muga	94.56*** (16.47)	0.06 (0.13)
Mulberry	13.74*** (5.63)	0.09 (0.39)
Total	901.16*** (603.52)	0.13 (0.22)
P-value	0.000	0.788
F-Stat	20.6***	0.352

Source: Calculated by Authors based on data collected from Director of Sericulture, govt. of Assam.

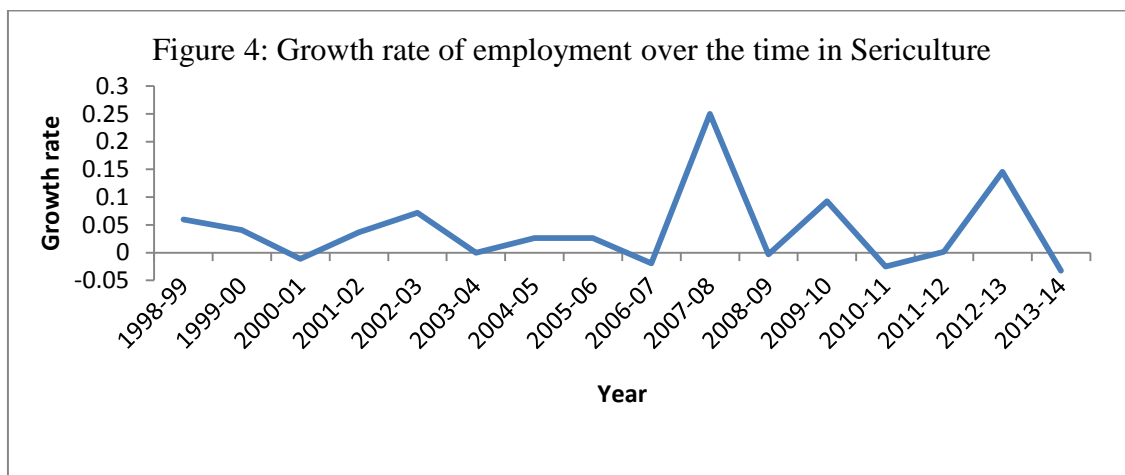
*** Represents significant at 1 percent level, Brackets in parenthesis indicate standard deviation.

Trend of Employment Status in Sericulture in Assam: Figure 3 demonstrates the trend line of the number of families engaged in sericulture since 1997-98 to 2013-14. It reveals that the total number of families engaged in raw silk has increased from 1,50,000 to only 2,50,000 over the whole time periods.



Source: Authors' calculation based on the data collected from Department of Sericulture, govt. of Assam.

Moreover, the trend is also not smooth and continuous over the period of time. This fluctuating trend of employment in sericulture is demonstrated in figure 4. It is revealed that the growth rate of employment in raw silk is negative in the periods 2000-01, 2003-04, 2006-07, 2010-11 and 2013-14 as well.



Source: Authors' calculation based on the data collected from Director of Sericulture, govt. of Assam.

Variations in average no. of Families Engaged in Sericulture: Table 2 provides the variation in number of families engaged in different components such as Eri, Muga and Mulberry production in Assam. It is observed that average total number of families engaged in raw silk production activity in different time periods is more than two lakh in

which the number of families engaged in Eri constitute 1.51 lakh, while it is only 29 thousand and 31 thousand in both Mulberry and Muga production respectively. This variation among different components in regard to employment of raw silk production is also found to be statistically significant at 1 percent level. The F-statistics reveals that the model is also fit.

Table 2: Disparity in Average no of families engaged in various Silk productions

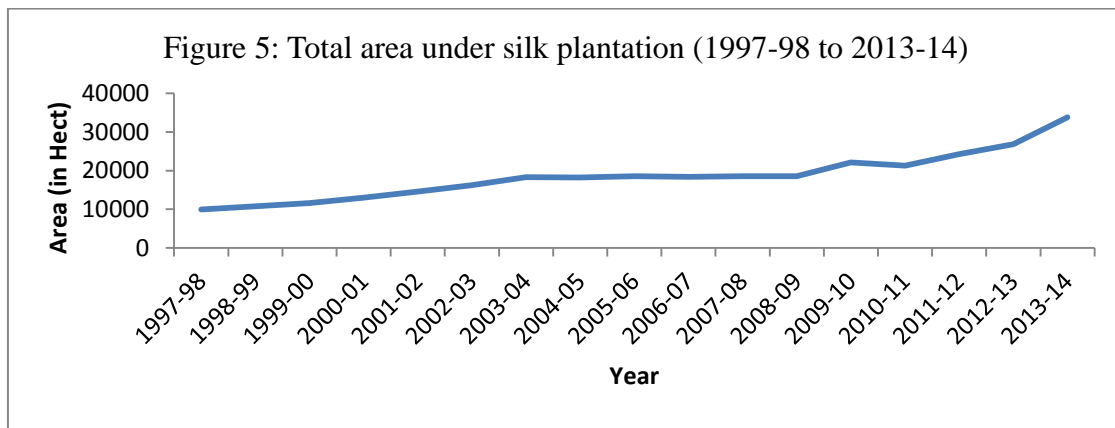
	Average employment	Average growth of employment
Eri	151456.5*** (30823.89)	0.02 (0.03)
Muga	30787.94*** (13241.95)	0.10 (0.16)
Mulberry	29039.71*** (3759.58)	0.04 (0.16)
Total	211284.2*** (45180.74)	0.04 (0.07)
P-value	0.000	0.24
F-Stat	176.225***	1.44

Source: Calculated by Authors based on data collected from Director of Sericulture, Govt. of Assam.

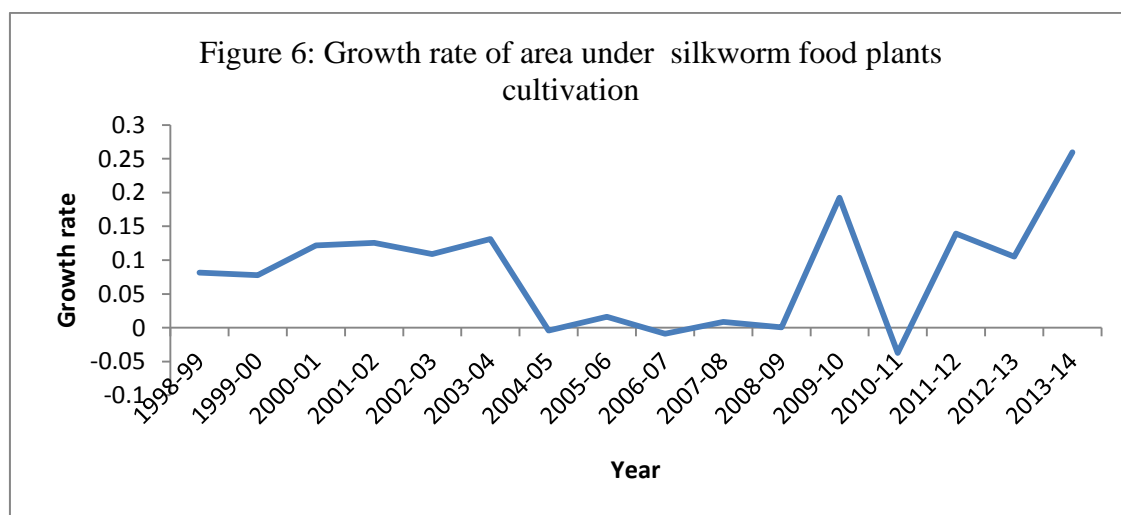
*** Represents significant at 1 percent level, Brackets in parenthesis indicate standard deviation.

Similarly, column 3 in table 2 shows the average growth rate of employment in sericulture in different time periods. In terms of growth rate of various sub-components in number of families engaged in raw silk production it is observed that growth rate is highest in muga activity (0.10) followed by mulberry (0.04) and eri (0.02). However, these differences are not at all statistically significant at any level.

Trend of Total area under Silkworm Food Plant Cultivation in Assam: The table 5 demonstrates the trend of total area under silkworm food plant cultivation in Assam. It is revealed that trend of area under cultivation increases over time periods which start to increase sharply particularly after 2009-10.



Source: Author's calculation based on the data collected from Director of Sericulture, Government of Assam.



Source: Authors calculation based on the data collected from Director of Sericulture, Govt. of Assam.

However, the trend in growth rate of area under cultivation is not smooth rather it is fluctuating over the period of times. It is depicted in the figure 6 that up to period 2004-05 the growth rate is positive, but from 2005-06 to 2010-11 the growth rate is very low even it is zero, and sometimes it is negative as well. Although after that period the growth rate of area under cultivation started to increase.

Table 3: Disparity in Average area under different Components of Silk Plantations (in hectare)

	Average area under plantation	Growth rate average area under plantation
Eri	7147.77*** (2704.97)	0.10 (0.17)

Muga	6924.56*** (2329.87)	0.08 (0.10)
Mulberry	4461.35*** (1444.46)	0.07 (0.13)
Total	18533.68*** (6068.61)	0.08 (0.08)
TP-value	0.000	0.89
F-Stat	52.19***	0.20

Source: Calculated by Authors based on the data collected from Director of Sericulture, Government of Assam.

*** Represents significant at 1 percent level, Brackets in parenthesis indicate standard deviation.

Table 3 displays the variation in average area under silkworm food plant cultivation in regard to different sub-components of raw silk production in Assam. It is revealed that total average area under silkworm food plantation is around 18533 hectare in Assam. Among them Eri constitutes 7148 hectare approximately followed by Muga (6925 hectare) and Mulberry 4461.35 hectare approximately. This variation among different sub-components is statistically significant at 1 percent level as reflected in the F-value of the model. However, variation in the average growth rate under different sub-components is not statistically significant at any level as revealed in column 3 in the table 3.

Conclusion: Significant variations have been observed in raw silk production over the years and also among the different components i.e., eri, muga and mulberry. The same picture is also found in employment generation and its various components in Assam during 1998-99 and 2013-14. Having observed the significant variations of raw silk production and its different components, it would be highly risky to provide policy recommendations. To have a proper policy one should analyse the factors that are responsible for such variation. Thus, future research should cover this aspect. However, general prescription may be provided which include modernization of sericulture activities, introduction of improved technologies, imparting training to acquaint the sericulturists with the modern technologies and alike for sustained development in sericulture by increasing the silk production and employment generation in the state of Assam.

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