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Sericulture in the Lakhimpur District of Assam: Unravelling the Threads of Tradition and Development

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Abstract

Sericulture in Assam holds a rich historical and cultural significance. Assam, known for its unique climate and conducive environment, has been a traditional hub for silk production. The state is renowned for its Muga and Eri silk varieties, each contributing to the vibrant textile heritage. The sericulture industry in Assam not only plays a pivotal role in the economic landscape but also fosters employment opportunities in rural areas. Despite its cultural and economic significance, challenges such as pest management, technology adoption, and market fluctuations persist. This research paper explores the intricate landscape of sericulture in the Lakhimpur district of Assam, investigating the entire silk production cycle from silkworm rearing to silk processing. The study delves into the historical significance of sericulture in the region, highlighting its cultural and economic importance. Through a multidimensional analysis, the paper assesses the socioeconomic impact of sericulture on local communities, shedding light on employment opportunities, income generation, and overall community development. Furthermore, sustainable sericulture practices are scrutinized, emphasizing environmentally friendly approaches that ensure the longevity of this traditional industry. The findings of this research contribute valuable insights to both academic discourse and practical strategies for fostering sustainable sericulture practices in the Lakhimpur district and beyond.

Keywords: Muga, sustainable sericulture, community development, socioeconomic impact

1. Introduction

The unique state of Assam in North-East India located between 24°048' and 27°009' north latitudes and 89°082' and 96°110' east longitudes has a rich history, deeply intertwined with the state's cultural and economic fabric. Known for its conducive climate and abundant natural resources, Assam has emerged as a significant hub for silk production. The sericulture industry in the region primarily focuses on the cultivation of silkworms and the production of high-quality silk, contributing to both local livelihoods and the state's economic growth.

Nestled in the verdant landscapes of Assam, the Lakhimpur district stands as a cradle of tradition and a hub for the age-old practice of sericulture. North Lakhimpur serves as its headquarters. Lakhimpur district is bordered to the north by the districts of Siang and Papumpare in Arunachal Pradesh, and to the east by the Subansiri River and Dhemaji District in Dhemaji. The district is located approximately in latitudes 26.48' and 27.53' north and longitudes 93.42' and 94.20' east. For centuries, the region's identity has been based on the manufacturing of silk, which is firmly embedded in the region's cultural fabric. In order to fully understand the complex aspects of sericulture in the Lakhimpur district, this research study will examine its historical foundations, evaluate its socioeconomic effects in the present, and identify the ties that bind tradition to contemporary advancement. Even while sericulture has surely been crucial

in forming Lakhimpur's identity, it is important to recognise its current importance as well as its potential going forward. This study aims to clarify the socioeconomic aspects of sericulture by analysing how it creates jobs, expands income options, and advances the district's general development. Moreover, the study explores the ecological aspects of sericulture in Lakhimpur in a time when sustainability is crucial. In order to ensure that sericulture not only survives but flourishes in the constantly changing terrain, we strive to find a balance between tradition and innovation by closely examining the environmental impact and investigating sustainable strategies within the sector. By means of this investigation, the study aims to provide a comprehensive comprehension of sericulture in the Lakhimpur district, presenting perspectives that beyond scholarly inquiry to advise policies, procedures, and sustainable development programmes. We want to value and protect the cultural heritage while building a robust and sustainable sericulture sector for future generations as we untangle the strands of tradition and progress.

Lakhimpur, an Assamese district, is unique in the sericulture scene because of its focus on Muga Silk. Muga silk is a type of wild silk that is specifically associated with the Indian state of Assam. The silk has a sparkling, glossy texture, a natural yellowish golden tinge, and is renowned for its extraordinary longevity. Renowned for its golden sheen, Muga Silk has its origins in the ancient sericulture legacy of

Lakhimpur. This introduction explores the special significance of Muga Silk in Lakhimpur, highlighting its cultural significance, economic influence, and the labor-intensive technique of producing this fine silk.

Muga is known scientifically as *Antheraea assamensis* helper. The insect is holometabolous, going through four phases in its life cycle: egg, larva, pupa, and adult moth. It is one type of insect that creates extremely precious and unusual golden coloured threads is the muga. The only region in the world where muga rearers have been historically growing Muga silkworms since time immemorial is the Brahmaputra valley in Assam. Apart from Tripura, it is found in the wild in other north-eastern Indian states, where people raise it after gathering it from the jungles.

Muga's historical legacy dates back to Assamese prehistory. In the Mahabharata, King Bhogodatta of Kamrupa engaged in fierce combat with the Pandavas while donning a turban made of Muga cloth atop his head. This is known as elocation. Even the Rig-Veda reminds us to think back to the clothing made with golden threads. The significance of muga silk-that is, the bestowal of golden muga cloth-was also discovered in the Kautilya Arthashastra. In this way, the muga industry changed into an agro-based industry, gained magnificent prestige, and opened up new opportunities. The fact that the muga industry in Assam and the Lakhimpur district has become self-sufficient and has taken the lead in the manufacturing of muga silk is a source of great pride. Due to Muga's arboreal nature, their rearers have historically placed them in trees such as *Persia bombycina* and *sualo*, *Litsea salicifolia*. Some rearers even go so far as to gather seed cocoons from various districts in upper Assam, such as Lakhimpur, and from other districts like Dhemaji, Dibrugarh, Sivasagar, Jorhat, etc., and place them in a bamboo sokori pera. Larvae growth and maturity are mostly influenced by the climate. After 22 to 50 days of feeding on the leaves, the larvae grow enough to begin weaving their cocoons. After gathering, rearers place them on saloni. The silkworms flow off their skin four times as larvae to promote growth, although their skin is extremely sensitive during this time. Various species of birds, snakes, and monkeys are the larvae's enemies. When it matures, it is referred to as a pupae. Every mature worm is gathered

2. Materials and Methods

The present investigation was carried out in 4 villages, namely Silikhaguri, Gohain tekela, Mojoguri and Bhogmon Village of Lakhimpur district, Assam based on potentiality and production of muga cocoons, where three types of sericulture – Muga, Eri and Mulberry are being practiced. Lakhimpur district is major silk growing area where almost every household is more or less engaged in sericulture activity. According to information obtained from the Central Silk Board in North Lakhimpur and the Department of Sericulture in Lakhimpur, there are 14,441 Mulberry rearers, 9030 Eri rearers, and 7571 Muga rearers in around 716 villages. The primary data was gathered using the personal structured interview schedule that Nagaraja (1989) [3] standardised from the sampled respondents. As previously mentioned, four communities were chosen at random, with 25 beneficiaries in each community, in order to gather data. As a result, 100 beneficiaries were chosen from every village. The farmers were categorized into main

and supplemental groups according to their level of employment engagement.

$$M = (1/N) \sum fx,$$

Where N = Number of observation

F = Frequency (collected data)

x = Variable (as per situation)

3. Results and Discussion

On the basis of study, the analysis pertaining to employment, income, occupation, risks factor and social impact, Domestic Expenditure, Type of live stocks, Cocoon production, Duration of rearing of silkworm, Basic preparation for sericulture, Occupation before sericulture, Displacement for sericulture, Suggestion for change.

A. Status of House: In study area analysis of the first type of information related that the Kachha houses are about 95%. On the other hand Pakka house are 5% out of total respondents. Regarding ownership of house all the respondents have their own house in all the villages.

B. Land Distribution: Every seri farmer had been indulging in sericulture farming since long time. During the survey in the study area, it is found that on an average every seri farmer grows paddy in 2.5 bighas (0.32 ha) of land, and different seasonal crops in 0.8 bighas (0.12 ha), sericultural host plants in 3.5 bighas (0.48ha), bamboo in 0.5 bighas (0.08 ha) and other plantation crops in 0.2 bighas (0.03 ha) of land as shown in Figure 1.

C. Status of Working Member: Among the families of the 4 villages under survey, It is observed that in Gohain tekela village the number of working members in 10 families is 2, in 12 families 3 and in 3 families 4 are working whereas in Mojoguri, the number of working members in 6 families is only 1 and in 9 families 2, and in 10 families 3 members are working. In Silikhaguri, and Bhogmon Village in 15 families 02, in 7 families 03 members and in 3 families 04 members are working. It is clear through the analysis that average 3 members are involved in the occupation from the families. It means there is a positive attitude of the members from each family.

D. Occupation before Adopting Sericulture: Out of 100 respondents from study area, for 75 of them the main occupation before adoption of sericulture was Agriculture, whereas 25 respondents do as agriculture labour. It is also worth mentioning that most of them are highly benefitted by adopting sericulture along with agriculture.

E. Assessment of Host plants: Assessing the number of host plants and available leaves on the host plants of the farmer would help in obtaining the profit and proper utilization of the natural resources of the farmer would help in finding possible ways to intervene in order to help the farmer in deriving benefit from the available resources.

In the study area, the total number of available host plants for a seri farmer was assessed and on an average the host plant of Muga silkworm, namely Som was found to be highest followed by mulberry plantation as depicted in Table.1.

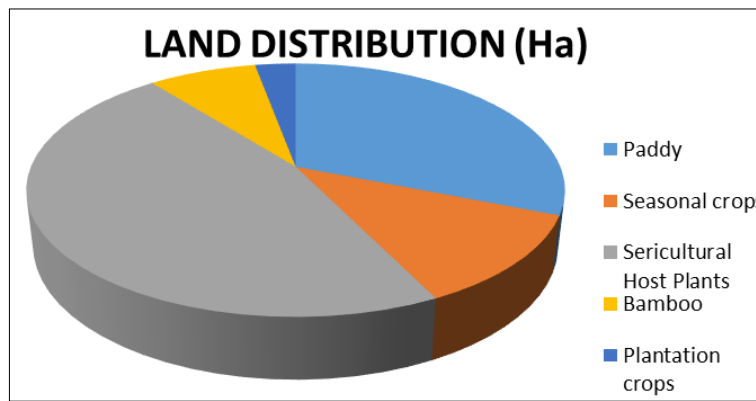


Fig 1: Average Land Distribution (ha) of a farmer

Table 1: Assessment of various Host plants of Silkworm.

Silkworms	Name of the Host plants	Total number of Host plants	Area (Bigha)
Muga	Som and Dighloti	78	2.5
Eri	Castor and Kesseru	10	0.025
Mulberry	Mulberry	14	0.28
Tasar	Nil	Nil	Nil

procurement of seed cocoons were surveyed and the details of the data are depicted in Table. 2.

G. Cultivation Practices for host plant production

The seri farmers collected the planting material from District Sericulture Deptt. Farm, Japisajia. They have followed various cultivation practices like land preparation, ploughing, levelling and spacing. The details are presented in Table. 3.

F. Procurement of seed cocoons

During the study in the villagers under considerations, the

Table 2: Details of the procurement of seed cocoons

Particulars	Muga	Eri	Mulberry	Tasar
Source of seed	i) Own seed cocoon. ii) District Sericulture deptt. iii) CSB, Japisajia iv) Sivasagar, patsaku	i) Eri seed grainage centre, Japisajia ii) Own seed	i) District Sericulture Department ii) CSB, Japisajia	Nil
Packaging material of seed cocoon	Cartoon	Muslin Cloth, polythene bag	Muslin Cloth, polythene bag	Nil
Time of transportation of seed cocoons	Morning and evening	Morning and evening	Morning and evening	Nil
Mode of transportation	Vehicle	Vehicle	Vehicle	Nil

Table 3: Details of cultivation practices for host plant production.

Silkworm Host plants	Cultivar / Variety	Area of planting (bigha)	Season/ month of propagation	No. of planting material	Method of sowing	Spacing
Som	Nahorpatiya	2.5	March-April	-	Pit sowing	3m X 3m
Castor	NBR1	0.025	Sept-Oct	--	-	90cm X 90cm
Mulberry	Jatinuni	0.28	Aug-Sept	-	Pit sowing	1m X 1m



Fig 2: Harvested mulberry cocoons



Fig 3: Stored Eri cocoons



Fig 4: Traditional reeling activity



Fig 5: Eggs in Khorika



Fig 6: Keeping the moth in Grainage for coupling



Fig 7: Coupling of moths

H. Disease of Host Plants

In the survey and surveillance of major pest and disease complexes of the silkworm host plants, it is found in the

study area that host plants are affected by quite a number of pests as stated in Table. 4.

Table 4: Various Disease incidence on the host plants of silkworm.

Name of the host plants	Date of survey	Pest/Disease	Stage of host plant attack	Intensity of attack
Som	21.02.22 29.03.22	i) Stem Borer (<i>Zeuzera indica</i>)	Mature stage	Less
		ii) Leaf Gall (<i>Aspondylia sp.</i>)	Mature stage	Medium
		iii) Leaf Minor (<i>Phytomyzasp.</i>)	Young stage	Medium
		iv) Amphutukoni Muga (<i>Cricula trifenestrata</i>)	Mature stage	Medium
		White Ant (<i>Odontotermes feae</i> , Wasmann)	Mature stage	Less
Dighloti	05.04.22	Leaf gall	Mature stage	Less
Mulberry	11.04.22	Powdery mildew (<i>Phyllactinia corylea</i>)	Mature stage	Less
Castor	22.02.22	Castor Slug (<i>Parasa lepida</i>)	Mature stage	Medium

I. Risk Factor and Sericulture: Every step of the sericulture process, from raising the raw silk to marketing it, carries some level of risk. Of the 100 responders, 45 had experienced a loss due to sericulture, whereas the remaining 55 had not incurred any harm. It conveys the difficulty and danger associated with it. Nearly all of them blamed the loss on atmospheric fluctuations and unfavorable weather, such as heavy rains, high temperatures, storms, and pollution, which can induce illness and cause crops to fail entirely. Numerous respondents said they were not compensated by the government. The officers of the sericulture department offer their full cooperation to each and every respondent.



Fig 8: Leaf gall on som leaves



Fig 9: Uzi Infested Muga Silkworm



Fig 10: Eggs of mealybugs moths

J. Sericulture and Social Impact

It is noted that every respondent cited sericulture's benefit on environmental conservation as follows: No tree-cutting or tree-felling Local employment is created, and interstate migration is monitored. It provided as another source of revenue. Having formed a regular saving habit, I wish to keep up my sericulture. It fits their way of life. It's an easy task that can be completed for free. Can better facilitate the creation of additional revenue and open the door for the creation of local jobs. According to estimates, each respondent's annual income increased to an average of Rs. 25,000.

K. Existing Farm Plan

Farm planning is the technique of making sound decisions by the farmers. It is a scheme for the operation and organizing of the farm business.

After evaluation of the existing farm plan, it was found that on an average a farmer having 1.2 bighas of land covered by sericultural host plants bears Rs. 800 for host plant production which includes the cost of saplings, land preparation, fertilizer and land revenue whereas a farmer on an average invest Rs. 970 for rearing of silkworm which involves cost of the seed, rearing appliances and disinfectants. Thus the total cost of investment is Rs.1800 (approx.) and the total income earned on an average by a farmer amounts to Rs.14000 which includes selling of saplings, muga cocoon, raw muga silk, eri cut cocoons, etc. This brings the benefit-cost ratio to 6.7:1.

L. Proposed Farm Plan

From the analysis of the existing farm plan, a new plan was proposed to the sericulture farmers in order to increase their

income from sericultural activities. The total proposed investment to be made by an individual farmer is Rs. 6160 which includes cost of host plant cultivation, silkworm rearing and cost of reeling and spinning. As per the proposed investment, the expected income to be earned from selling of saplings, muga cocoon, raw muga silk, eri cut cocoons, etc. is Rs. 50,520. This will increase the benefit-cost ratio to 7.20:1.

M. Suggestions for Change

The survey discovered that the rearers had a variety of issues, the most common being financial, environmental, and marketing difficulties. Based on the aforementioned issues, the recommendations that follow are made:

- Muga rearers should receive advanced training on housekeeping procedures and disinfecting techniques.
- The government and the sericulture department ought to start a muga silk product market right away and figure out what the acceptable pricing is for muga silk products in their local district.
- Some muga seed zones should be identified, and scientific seed farms should be constructed in the district of Lakhimpur in order to meet the current demand for seed cocoons.
- Public meetings, radio, television, and publications should be used as a network to bridge the information gap that exists between the government and rearers and weavers regarding sources of funding, the availability of current technology, the market, etc. This will benefit future generations.
- The environment and climate pose a significant challenge to parents. The scientifically designed safe room is where the cocoons should be kept to protect them from climate-related threats.
- The government ought to offer the rearers sufficient insurance options. When people have losses, it aids them.

4. Conclusion

In conclusion, this research paper provides a comprehensive overview of sericulture in the Lakhimpur district of Assam. The findings underscore the significant historical, cultural, and economic contributions of sericulture to the region. Through an exploration of the entire silk production process, from silkworm rearing to silk processing, the study illuminates the intricate dynamics of this traditional industry. The socioeconomic impact of sericulture emerges as a central theme, revealing its role in generating employment, fostering income opportunities, and contributing to the overall development of local communities. The paper emphasizes the need for continued support and strategic interventions to harness the full potential of sericulture as a catalyst for sustainable development in the Lakhimpur district. Additionally, the examination of sustainable sericulture practices underscores the importance of adopting eco-friendly approaches to ensure the long-term viability of this industry. As sericulture stands at the intersection of tradition and modernity, the research advocates for a balance that preserves cultural heritage while embracing innovations that enhance efficiency and environmental responsibility. In light of these insights, the study not only adds depth to the understanding

of sericulture in the Lakhimpur district but also offers practical implications for policymakers, researchers, and practitioners. By acknowledging the challenges and opportunities within the sericulture sector, this research paper serves as a foundation for future endeavors aimed at fostering sustainable development and preserving the rich legacy of sericulture in Assam.

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