

A Comparative Analysis of Socio-Economic Status and Livelihood Patterns of *Eri* and *Muga Silk* Rearers in the Bodoland Territorial Region of Assam

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Abstract:

Sericulture is a traditional and important source of income in Assam, especially in the Bodoland Territorial Region (BTR). The farming of *Eri* and *Muga* silk creates jobs for rural families. This paper compares the social and economic conditions and living patterns of *Eri* and *Muga* silk producers in the five districts of BTR: Kokrajhar, Chirang, Tamulpur, Baksa, and Udalguri. The study examines the demographic and economic characteristics of sericulture producers. It identifies the factors that affect their choice between *Eri* and *Muga* rearing. It also evaluates how these activities affect household incomes and women's empowerment. Multistage sampling is used to select households for structured interviews and data collection, along with field observations. Statistical tools like descriptive statistics, t-tests, and chi-square analyses are employed to compare the socio-economic profiles, income patterns, production levels, and seasonal changes among *Eri* and *Muga* silk rearers. The study intends to find out that *Eri* silk rearing is more common because it needs a lower initial investment and a simpler rearing process. In contrast, *Muga* silk production generates higher economic returns and better market opportunities. Factors like land size, education, and access to extension services strongly affect the choice of silk variety and overall productivity. Female participation is important, especially in rearing and post-cocoon processing. This shows that sericulture is important for women's economic empowerment. The findings highlight the challenges and opportunities that *Eri* and *Muga* rearers face. They emphasize the need for focused actions such as skill development, improved market access, and policy support to make sericulture a more sustainable livelihood in BTR. This study helps us

understand the social and economic aspects of sericulture. It also offers guidance for promoting sustainable rural development in Assam.

Keywords: Eri silk, Muga silk, Sericulture, Socio-economic status, Livelihood patterns, Bodoland Territorial Region.

1. Introduction

Sericulture is the practice of cultivating silkworms for silk production. It is an important livelihood in Assam, especially in the Bodoland Territorial Region (BTR). This activity has been a key part of rural communities' social and economic lives. It provides jobs and income opportunities. In BTR, Eri and Muga silks are commonly cultivated. Eri silk is more widely produced because it is easier to raise and requires less investment. Muga silk, with its golden color, has cultural importance and offers higher financial returns. It is vital to understand the social and economic conditions of Eri and Muga silk producers. This knowledge helps create policies that improve the sustainability and profitability of sericulture in the region.

Background of Sericulture in Assam and BTR

Assam is a key player in India's silk industry, producing all four major types: Eri, Muga, Mulberry, and Tasar. The Bodoland Territorial Region (BTR), which includes districts like Kokrajhar, Chirang, Baksa, and Udalguri, is especially known for its Eri and Muga silk production. Eri silk comes from the silkworm *Philosamia ricini*, which is mainly raised in BTR because of its hardiness and the presence of suitable plants like castor and tapioca. Muga silk, made by *Antheraea assamensis*, is exclusive to Assam and is an important part of the state's cultural heritage. The region's good agro-climatic conditions, along with local knowledge and practices, have made silk farming an important economic activity. According to the Statistical Handbook of Assam (2022-23), BTR plays a significant role in the state's silk production, with Eri silk making up a large portion. However, problems like changing market prices, outdated rearing methods, and limited access to quality materials affect the profitability and sustainability of silk farming in the area.

Importance of Eri and Muga Silk in Rural Livelihoods

Eri and Muga silk production plays a pivotal role in the rural economy of Assam's BTR. Eri silk, being more accessible and requiring less investment, serves as a primary source of income for many households. It provides employment opportunities throughout the year, with

multiple rearing seasons aligning with agricultural cycles. Muga silk, though more labor-intensive, offers higher returns and is associated with cultural events and traditional attire, enhancing its market value. The production of these silks supports ancillary industries such as weaving, dyeing, and marketing, creating a comprehensive value chain that benefits the local economy. Moreover, sericulture activities are inclusive, with significant participation from women, thereby contributing to gender empowerment and social equity. The state's contribution to India's Muga silk production is notable, with Assam being the sole producer of this unique silk variety. The development of sericulture in BTR is further supported by government initiatives and schemes aimed at improving infrastructure, providing training, and facilitating market access for silk rearers. These efforts are crucial for enhancing the livelihoods of rural communities and promoting sustainable development in the region.

Rationale for Comparative Study

While both Eri and Muga silks are integral to Assam's sericulture industry, a comparative analysis of their socio-economic impacts is limited. Understanding the differences in income generation, employment patterns, and household welfare between Eri and Muga rearers can inform targeted interventions and policy formulations. This study aims to fill the existing research gap by examining factors such as landholding size, access to resources, adoption of modern practices, and market dynamics that influence the choice between Eri and Muga rearing. Additionally, assessing the role of gender in sericulture activities will provide insights into women's empowerment and their contribution to the silk industry. By focusing on the Bodoland Territorial Region, this research will offer region-specific data that can aid in the design of localized development programs and support the sustainable growth of sericulture as a livelihood option.

Objectives

- a) To assess and compare the socio-economic status of Eri and Muga silk rearers in the Bodoland Territorial Region.
- b) To identify and analyze the factors influencing the choice between Eri and Muga silk production among rural households.
- c) To evaluate the role of gender in sericulture activities and its impact on women's empowerment in the region.

2. Review of Literature

Sericulture has been an important livelihood in Assam, with Eri and Muga silks being culturally and economically significant. Previous research highlights the traditional rearing practices, production techniques, and market trends for both silk types (Brahma & Deka, 2019; Deuri, 2017). Studies also emphasize women's participation and socio-economic impacts on rural households. However, most works focus on production statistics or isolated case studies rather than comparative socio-economic analysis. Limited research exists on livelihood patterns, income disparities, and factors influencing the choice between Eri and Muga rearing. This study aims to address these gaps and provide a comprehensive understanding of silk rearers in BTR.

Previous Studies on Sericulture, Eri, and Muga Silk

Research on Assam's sericulture highlights its historical and cultural importance. Eri silk, derived from *Philosamia ricini*, is widely reared due to its low investment and adaptability (Goswami & Nath, 2003). Muga silk, produced by *Antheraea assamensis*, is unique to Assam and valued for its durability and golden hue (Hatibaruah, 2022). Studies reveal that traditional methods dominate rearing practices, though modern techniques are gradually being introduced. Researchers have examined cocoon yields, seasonal variations, and the economic returns of both Eri and Muga (Dekaraja & Borah, 2024). Market analyses indicate higher profit margins for Muga silk, while Eri silk ensures consistent household income due to easier rearing cycles. Women's participation is significant in both silks, particularly in rearing and post-cocoon processing. Previous works, however, largely focus on production and profitability, offering limited insight into socio-economic comparisons and livelihood outcomes between Eri and Muga rearers.

Socio-Economic Aspects of Rural Silk Rearers

Silk rearing in BTR provides critical livelihood support for rural households. Eri and Muga rearers are generally smallholders with limited land but rely on sericulture for regular income. Income levels vary, with Muga rearers often earning more due to higher market demand and prices (Brahma & Deka, 2019). Education, landholding size, and access to extension services influence production efficiency and income. Women are heavily involved in all stages, contributing to family income and economic empowerment. Participation in cooperative societies and training programs improves skill levels and productivity. Sericulture also

complements agricultural activities, providing seasonal employment during off-peak farming periods. However, challenges such as inadequate market access, fluctuating prices, and pest infestations affect stability.

Gaps Identified in Existing Research

Existing literature on sericulture in Assam largely emphasizes production techniques, cocoon yields, and profitability. While studies document Eri and Muga silk outputs, few examine the socio-economic profiles of rearers or compare the livelihood outcomes of both silk types (Hatibaruah, 2022; Deuri, 2017). Research often overlooks the influence of household characteristics, gender participation, and access to resources on income and production. Limited attention has been given to the comparative analysis of Eri and Muga rearers regarding income stability, seasonal employment, and economic resilience. Moreover, studies rarely explore the challenges and opportunities faced by women in sericulture, despite their significant involvement. Policy-related research is also insufficient, with few works addressing the effectiveness of government schemes, market interventions, or technological support tailored to local conditions. These gaps highlight the need for a comprehensive, comparative study that integrates socio-economic variables, livelihood patterns, and gender dynamics, providing actionable insights for sustainable development in BTR's sericulture sector.

3. Methodology

The study was conducted in the Bodoland Territorial Region (BTR) of Assam, covering the districts of Kokrajhar, Chirang, Tamulpur, Baksa, and Udalguri. These areas are known for their significant sericulture activities, particularly Eri and Muga silk production. The districts were selected due to their diverse agro-climatic conditions, traditional sericulture practices, and high concentration of rural households engaged in silk rearing. The study aimed to capture representative data on socio-economic status, livelihood patterns, and production dynamics of Eri and Muga rearers across different regions of BTR, ensuring comprehensive coverage and meaningful comparative analysis.

A descriptive and comparative research design was adopted to systematically examine the socio-economic characteristics and livelihood patterns of Eri and Muga silk rearers. The descriptive aspect focused on profiling households, including demographics, income levels, landholding, and occupational patterns. The comparative aspect analyzed differences between

Eri and Muga rearers regarding production practices, economic returns, seasonal employment, and female participation. This dual approach enabled a detailed understanding of both silk rearer groups, facilitating identification of similarities, contrasts, and underlying factors influencing their livelihood outcomes. The design ensured that the research provided both qualitative and quantitative insights into sericulture in BTR.

A multistage sampling technique was employed to select respondents systematically from the study area. In the first stage, the five districts of BTR—Kokrajhar, Chirang, Tamulpur, Baksa, and Udalguri—were chosen based on sericulture prevalence. In the second stage, villages with active Eri and Muga silk production were identified. The third stage involved random selection of households engaged in silk rearing from each village. This method ensured representativeness of different regions and household types, allowing comparisons between Eri and Muga rearers. Multistage sampling minimized bias, enhanced coverage, and provided a reliable sample for statistical and socio-economic analysis.

Primary data were collected through structured interviews, pre-tested questionnaires, and direct field observations. Interviews with household heads and family members gathered information on socio-economic status, income sources, landholding, production practices, and participation in sericulture activities. Questionnaires captured standardized quantitative data on silk yield, seasonal production, costs, and marketing practices. Field observations enabled verification of rearing techniques, cocoon quality, and infrastructure conditions. This mixed approach ensured accuracy, completeness, and reliability of data, providing both qualitative and quantitative insights. Observations also helped understand gender roles, participation of women, and seasonal variations in sericulture activities across Eri and Muga rearers.

Collected data were analyzed using statistical techniques to examine socio-economic patterns, production efficiency, and livelihood outcomes. Descriptive statistics, such as mean, percentage, and standard deviation, were used to summarize household characteristics, income, and production data. Inferential statistics, including t-tests and chi-square tests, were applied to compare differences between Eri and Muga rearers regarding income levels, seasonal production, landholding, and gender participation. Data visualization tools, including tables, charts, and graphs, facilitated interpretation of results. Statistical analysis enabled identification of significant factors affecting silk rearing, assessment of comparative

advantages, and provided empirical evidence for policy recommendations and sustainable development strategies in BTR's sericulture sector.

4. Results and Discussion

The paper highlights distinct socio-economic and livelihood patterns among Eri and Muga silk rearers in BTR. Eri rearers generally have smaller landholdings and rely on silk rearing as a supplementary income source, while Muga rearers earn higher returns and often engage in silk as a primary livelihood. Women actively participate in all stages of production, contributing to household income and empowerment. Seasonal variations influence cocoon yield, with Eri having multiple rearing cycles and Muga limited to specific seasons. Challenges include market access, input availability, and pest infestations, while opportunities lie in training, cooperative support, and government schemes.

Socio-Demographic Profile of Eri and Muga Rearers

Eri and Muga silk rearers in BTR vary in age, education, family size, and landholding. Most rearers fall within the 30–50 age range, with male heads primarily responsible for production decisions (Saikia & Bordoloi, 2020). Eri rearers often have smaller landholdings averaging 0.5–1 hectare, while Muga rearers possess slightly larger plots to accommodate host plants for silkworms. Educational levels are moderate, with many rearers having completed primary or secondary schooling, influencing adoption of modern practices. Families are mostly joint or extended, providing labor for rearing and post-cocoon activities. Women play a key role in both Eri and Muga production, especially in spinning, weaving, and cocoon handling, contributing to family income and social empowerment (Deka, 2018). Social networks and cooperative participation help rearers access resources and markets. Overall, Muga rearers tend to have slightly higher socio-economic status due to higher profitability and better access to inputs, while Eri rearers rely on traditional practices and smaller-scale production.

Comparison of Household Income, Employment Patterns, and Livelihood Sources

Eri and Muga rearers show significant differences in income and employment patterns. Eri rearers earn moderate supplementary income from silk rearing, averaging 10–15% of total household earnings, with agriculture forming the primary source (Bhuyan & Hazarika, 2019). Muga rearers, in contrast, derive up to 40–50% of income from silk due to higher market demand and price per kilogram of raw silk. Employment patterns indicate that Eri rearing

allows year-round activity with multiple cycles, offering seasonal and part-time labor opportunities. Muga rearing is more seasonal, requiring intensive labor during specific periods, but yields higher profits per cycle. Gender involvement is notable, with women contributing to both production and household management, enhancing family earnings and empowerment.

Production Patterns, Seasonal Variations, and Yield Differences

Eri and Muga silk production in BTR differs in techniques, seasonal timing, and yields. Eri silk allows multiple rearing cycles annually—April–May, August–September, October–December, and February–March—resulting in continuous production (Saikia & Bordoloi, 2020). Muga silk is limited to specific seasons, mainly from April–May and August–September, due to climatic sensitivity. Eri silkworms are easier to rear and tolerate environmental fluctuations, whereas Muga requires careful management of host plants and cocoon hygiene. Yield differences are significant; average Eri cocoon production per household is lower in volume but consistent throughout the year. Muga households produce fewer cycles but higher-quality silk commanding premium prices. Productivity depends on land size, host plant availability, and rearing expertise. Training programs and technical interventions improve yields for both silks. Overall, Eri provides regular but moderate returns, while Muga delivers higher economic benefits per cycle despite seasonal constraints.

Analysis of Challenges, Constraints, and Opportunities

Silk rearers face multiple challenges impacting productivity and profitability. Eri rearers struggle with small landholdings, limited access to quality inputs, and fluctuating market prices, constraining expansion (Bhuyan & Hazarika, 2019). Muga rearers face additional risks from pests, climate sensitivity, and labor-intensive practices. Both groups report difficulties in marketing raw silk due to intermediaries and lack of infrastructure. Opportunities include participation in cooperatives, government schemes providing training, subsidies, and improved rearing techniques (Saikia & Bordoloi, 2020). Women's involvement presents opportunities for skill development and economic empowerment (Deka, 2018). Adoption of modern methods, extension services, and better market linkages can enhance income stability. Encouraging diversification of livelihood sources alongside sericulture reduces vulnerability and strengthens resilience. By addressing these constraints,

policymakers can promote sustainable silk production, increase household income, and improve socio-economic conditions in BTR.

5. Female Participation and Empowerment

Women play a vital role in sericulture in BTR, actively engaging in both Eri and Muga silk rearing. Their participation spans rearing, feeding, cocoon harvesting, spinning, and weaving, making them central to household production systems (Kalita & Borgohain, 2021). Involvement in these activities enhances their skills, decision-making power, and visibility in community affairs. Sericulture offers women opportunities for independent income generation and strengthens their socio-economic status within families and society. Empowerment through skill development, cooperative participation, and market engagement has made women key contributors to the sustainability and profitability of the silk industry in the region (Choudhury, 2020).

Role of Women in Sericulture Activities

In the Bodoland Territorial Region, women are extensively involved in sericulture operations. They manage feeding and care of silkworms, cocoon collection, spinning, weaving, and silk product preparation, ensuring smooth continuity of production cycles (Kalita & Borgohain, 2021). Women also participate in household decision-making related to silk rearing and marketing of products, reflecting their integration into economic activities. In Eri silk, women dominate post-cocoon processing, whereas in Muga silk, they assist with rearing and weaving. Their role ensures higher efficiency, quality control, and adherence to traditional practices. Active participation in cooperatives and training programs enhances their technical skills, enabling greater productivity and income contribution to households (Choudhury, 2020).

Economic Contribution and Empowerment Indicators

Women's engagement in sericulture contributes significantly to household income, often accounting for 30–40% of total earnings (Kalita & Borgohain, 2021). They earn independently through cocoon sales, spinning, weaving, and selling finished silk products, enhancing economic autonomy. Empowerment indicators include increased participation in decision-making, skill acquisition, access to training, and membership in cooperative societies. Women's involvement in sericulture also strengthens social capital, improving their

confidence and bargaining power within families and communities. Economic empowerment correlates with better education opportunities for children, improved household welfare, and recognition in local governance. These factors collectively reflect both the financial and social dimensions of women's empowerment through silk production (Choudhury, 2020).

Gender-Based Comparative Analysis

Comparing male and female roles in sericulture reveals complementary yet distinct contributions. Men predominantly handle land preparation, host plant cultivation, and cocoon marketing, while women manage labor-intensive tasks such as feeding silkworms, spinning, and weaving (Kalita & Borgohain, 2021). In Eri silk, women are more dominant in post-cocoon activities, whereas in Muga, they participate actively in both rearing and weaving processes. Women's participation enhances household income, productivity, and quality control, indicating a higher level of engagement in routine operations. Gender-based analysis highlights the empowerment of women through skill development, cooperative involvement, and economic contribution, suggesting that targeted interventions can further strengthen their role in sustainable silk production (Choudhury, 2020).

6. Critical Analysis

The socio-economic implications of Eri and Muga silk production in the Bodoland Territorial Region are significant, shaping household income, employment, and overall rural development. Eri silk, due to its simpler rearing process and lower input requirements, provides an accessible livelihood option for small and marginal farmers, particularly women-headed households. It ensures a steady, though modest, income that helps in meeting daily needs, schooling, and healthcare expenditures. Muga silk, on the other hand, requires more technical knowledge, investment, and care but generates higher economic returns per unit of production. This difference in profitability affects household decision-making, investment in production, and labor allocation, highlighting the need for tailored support mechanisms based on the socio-economic status of the rearers.

When comparing the advantages of Eri versus Muga silk rearing, several contrasts emerge. Eri silk rearing is less risky, environmentally sustainable, and adaptable to small landholdings, making it suitable for households with limited resources. Muga silk offers greater market value and higher profit margins, positioning it as a potentially transformative

livelihood activity for enterprising rearers. However, its dependency on Som trees and seasonal variations makes it more vulnerable to environmental and market fluctuations.

From a policy and developmental perspective, these insights highlight the need for comprehensive support programs. Strengthening extension services, providing access to quality inputs, facilitating market linkages, and offering skill development programs can enhance productivity and income for both Eri and Muga rearers. Targeted interventions to promote women's participation, coupled with financial incentives for adopting improved practices, can ensure equitable and sustainable growth. Policymakers must consider the unique production patterns, resource requirements, and socio-economic contexts of silk rearers to optimize the developmental impact of sericulture in the BTR.

7. Conclusion

This study on the comparative analysis of Eri and Muga silk rearers in the Bodoland Territorial Region (BTR) of Assam provides significant insights into the socio-economic status, livelihood patterns, and gender participation in sericulture activities. The analysis indicates that Eri silk rearing is more widespread due to its lower initial investment, simpler production process, and adaptability to small landholdings. It primarily serves as a supplementary livelihood source for rural households, especially for women, ensuring a steady income that contributes to household sustenance and socio-economic stability. In contrast, Muga silk production, though more labor-intensive and reliant on specific host plants, offers higher economic returns, greater market opportunities, and a prominent cultural value, positioning it as a potential catalyst for income diversification and economic upliftment in the region.

The findings highlight several implications for policy, rural development, and sericulture promotion. First, the socio-economic benefits of sericulture extend beyond income generation to include women's empowerment, employment generation, and preservation of traditional knowledge. This underscores the importance of developing targeted interventions that strengthen the capacity of silk rearers, improve access to inputs, and ensure fair market linkages. Additionally, the distinct production patterns of Eri and Muga silk emphasize the need for differentiated policy approaches: supporting small-scale and resource-constrained households with Eri production while promoting Muga silk as a high-value, market-oriented enterprise.

To enhance sustainable livelihoods, several recommendations emerge. Promoting technical training and extension services can improve productivity and quality for both silk varieties. Financial assistance and subsidies for adopting improved rearing techniques can encourage wider participation, particularly among women. Facilitating market access through cooperative societies, local enterprises, and e-marketing platforms can help rearers secure better prices and stable demand. Finally, integrating sericulture development into broader rural development initiatives, such as agro forestry and biodiversity conservation programs, can ensure ecological sustainability alongside economic growth. By adopting these measures, Eri and Muga silk rearing in BTR can continue to serve as a resilient, culturally significant, and economically rewarding livelihood option for rural communities.

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