



Indian Knowledge Systems and Sustainable Eri Sericulture Practices in Kokrajhar and Baksa Districts of Assam

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ABSTRACT

This study examines the traditional practices of eri silk production among the Bodo community in the Kokrajhar and Baksa districts of Assam, emphasising the role of Indigenous Knowledge Systems (IKS) in sustainable sericulture. Eri silk, a non-mulberry silk variety, holds significant cultural and economic importance in the Bodoland Territorial Region (BTR), where sericulture is deeply embedded in community life and livelihoods. Data were collected from 180 respondents using questionnaires through a multistage sampling method. The findings revealed that eri rearing predominantly occurs at the pre-cocoon stage, with 55.40% of the responses, whereas only 12.10% of the responses continued until the post-cocoon commercial stage. Again, the majority of the rearers (46.5%) have been engaged in eri sericulture for the last 10 years, indicating that the population is newly adopting eri sericulture as a source of income, whereas only 19% of them have been engaged in it for more than 20 years. This study advocates policy support, capacity building, and the integration of modern technologies to strengthen the eri sericulture sector, ensuring sustainable development and cultural preservation in Assam's BTR.

Keywords: India Knowledge System, Eri silk, Bodo community, Bodoland Territorial Region

Introduction

Sericulture, the rearing of silkworms for silk production, is an important agro-based industry with significant socioeconomic implications. The silkworm has four life stages: egg, larva,

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pupa, and moth. Sericulture originated in China, which is considered its birthplace. From there, it spread to different parts of the world. According to some Indian scholars, there is evidence in ancient Sanskrit literature that silk has been produced in India from ancient times (S.M et al., 2025). Silkworm consists of mulberry and non-mulberry silks, where mulberry silk consists of *Bombyx mori*, which feeds only on the mulberry plant, and non-mulberry silk, also known as vanya silk, consists of eri silk (*Philosamia ricini*), which feeds on castor and kesaru plants, muga silk (*Antheraea assama*), which feeds on som and tasar silk (*Antheraea*) (International Sericulture Commission, 2025). India is the second-largest producer of silk and the world's largest consumer. In India, the majority of mulberry silk-producing states are Karnataka, Andhra Pradesh, West Bengal, Tamil Nadu, and Jammu & Kashmir, which account for 92% of the country's total mulberry raw silk production. Eri silk is primarily produced in the north-eastern states and Assam. In contrast, Muga silk is the pride of Assam, an integral part of the state's tradition and culture (Press Information Bureau, 2025).

The Indian Knowledge System (IKS) is one of the world's oldest traditions of learning, embracing economics through Kautilya's Arthashastra, science, medicine, arts, and spirituality. Indian sericulture, rooted in the IKS, blends well with ancient traditions, as knowledge is passed down over time. Basumatary & Brahma (2018) in their study focused on the Bodo community from the BTR of Assam, who are known for their culture and traditions, particularly for the use of silk. It explored the historical roots of Muga and silk culture in Bodo attire by explaining the significance of Muga silk in the Bodo economy. The art of Endi and Muga silk is an indigenous culture of the Bodo people. The author cited ancient texts, such as the Ramayana and Arthasastra, to highlight the origin and development of sericulture among the tribes. In Assam's BTR, sericulture has been practiced for a long time because the area's climate is favourable, and it is part of the cultural heritage of the Bodo people. Traditionally, sericulture in Assam, BTR, involves the rearing of Eri and Muga silks, but Eri silk holds the prime position in terms of the population engaged and Eri raw silk production.

Boro (2024) provides a view of the traditional culture of eri silkworm rearing among the Bodo people in the BTC area of Assam. Eri culture rearing is not only a culture but also has a huge economic contribution because it provides job opportunities to unemployed women. Each type of silk production employs distinct methods and relies on indigenous techniques passed down through generations. The traditional sericulture process in India encompasses



several essential stages. In BTR, sericulture is a community-centred practice that often involves entire families in various stages of the silk production process. This deeply rooted tradition not only provides a livelihood but also forms a crucial part of the region's cultural identity. It exemplifies a harmonious balance between sustainable agriculture and traditional craftsmanship, with the potential to integrate modern techniques to boost productivity while preserving cultural heritage. Narzary et al. (2023) highlighted the traditional and evolving practices of muga silk culture, weaving, and the silk industry in Assam with an emphasis on Sualkuchi. They revealed that the age-old Indigenous Technical Knowledge has proven sustainable in muga silk production; however, the industry faces challenges such as high silkworm mortality, poor silk recovery, and a lack of a proper marketing system.

The Kokrajhar and Baksa districts of BTR represent hubs of eri sericulture, particularly among the Bodo community. IKS plays a crucial role in determining sericulture practices. Indigenous techniques are transmitted intergenerationally and are closely linked to cultural identity and sustainability. Despite their huge potential, the sericulture sector faces challenges, such as limited technological adoption, inadequate infrastructure, and a lack of market linkages. This study analysed the prevalence of traditional and modern practices by examining rearers engagement across different production stages and evaluating the effectiveness of training programs.

Literature Review

Brahma (2015) conducted a field-based study in 26 sericulture villages of Kokrajhar district, Assam, using both qualitative and quantitative methods. The study found that eri culture is the most preferred among rearers because of both the value of the silk and the consumption of pupae as a by-product. Women contributed approximately 60% of the workforce, the overall scale and productivity were constrained by the continued reliance on traditional rearing methods without adequate technological support. Focusing on weaving, Basumatary & Khawzawl (2024) studied Bodo women weavers in Sundrihpora and Thalitbari villages of Kokrajhar district. They observed that although traditional handloom techniques have been modified through the gradual use of modern equipment, weaving remains a core marker of Bodo cultural identity, illustrating the dynamic nature of IKS when confronted with technological change. Borgohain & Borah (2022) reviewed the historical background and present status of mulberry and non-mulberry sericulture in Assam, drawing on classical texts



such as the Arthashastra and Kalika Purana. Their analysis suggests that non-mulberry silk production has expanded over the last decade, whereas mulberry production lags because of outdated manufacturing processes, underscoring the need for technological upgrading within a traditional sector.

Kashyap & Brahma (2025) examined eri culture practices in Kokrajhar district and reported that while eri rearing is widespread, nearly all rearers (99.84%) face leaf scarcity and 93.70% have limited plantation space. Rearers responded by identifying new host plants, demonstrating indigenous adaptive strategies, but also exposing ecological and land-use constraints that affect sustainability. Unni et al. (2009) documented indigenous knowledge of muga and eri silkworm rearing across the North-Eastern Region and compared traditional methods with scientific interventions. application of Plant Growth Promoting rhizobacteria (PGPR) and genetic improvements increased yield by 3–6%, raised larval survivability to 75%, and enhanced silk production by 15–20%, illustrating how integration of scientific inputs with traditional knowledge can improve productivity while retaining the local knowledge base. From a gender and livelihood perspective, Saikia & Ghosh (2018) assessed women's participation in eri culture in the Jorhat district. They reported high involvement (average 78.95%) in silkworm rearing and post-rearing activities such as spinning, but very low engagement (1.41–2.1%) in host-plant cultivation. A majority (71.91%) of women cited lack of an organised market as a major constraint, revealing structural barriers that limit the developmental potential of women-centred IKS in sericulture. Sarmah et al. (2023) conducted research in 10 Bodo-dominated villages of Kokrajhar district where eri culture is traditionally practiced. Their findings show that combining scientific methods, such as improved rearing houses, mechanised spinning, and new feeding techniques, with traditional practices leads to higher cocoon yield, better yarn quality, and enhanced employment opportunities for rural youth, offering a promising sustainable livelihood model.

Chakravorty et al. (2010) examined sericulture and silk weaving as traditional crafts in Assam, showing that handloom weaving is vital to both culture and the economy. They emphasised that exclusive dependence on traditional methods constrains product quality and marketability and argued for an integrated approach that combines traditional craftsmanship with modern techniques. Similarly, Hazarika & Saikia (2024), in a study of Lakhimpur district—another traditional muga hub—reported that sericulture substantially augments



household income, with a benefit-cost ratio of 6.7:1 under existing plans, underscoring its contribution to rural development. At a regional scale, Narzary & Boro (2025) reviewed silkworm-rearing practices across Assam, Meghalaya, Nagaland, and Arunachal Pradesh. They documented how traditional, eco-friendly methods are transmitted across generations and argued that their combination with scientific approaches can provide better rearing environments, improved host plants, and a more sustainable model for the regional silk industry. In contrast, Phukan & Chowdhury (2006) highlighted the fragility of traditional muga culture in Assam. They found that despite its deep roots in Assamese customs and traditions, muga rearing is deteriorating due to declining interest among younger generations, environmental pollution from tea gardens, and lack of organised markets, leading to stagnation in raw silk production. Overall, the literature establishes that indigenous knowledge in sericulture—especially among Bodo and other North-Eastern communities—forms a crucial foundation for culturally rooted and ecologically sensitive development; however, its sustainability depends on overcoming constraints in resources, marketing, and generational transfer while appropriately integrating scientific innovations.

Objectives of the study

- To examine current practices in eri sericulture and assess the prevalence of traditional versus modern eri rearing methods.
- To analyze the extent of rearers engagement across different stages of eri rearing.
- To evaluate the effectiveness of training programmes and their impact on rearers satisfaction.

Methodology

This study was conducted in the Kokrajhar and Baksa districts of the BTR, Assam. These districts were selected because of their strong traditions and the practice of eri sericulture among the Bodo community. A multistage sampling technique was used to select respondents from these two districts. First, selected villages with active sericulture practices were identified. In the second stage, the households engaged in eri rearing were selected.

A total of 180 respondents were surveyed. Primary data were collected from them using structured questionnaires and personal interviews. The collected information was analysed



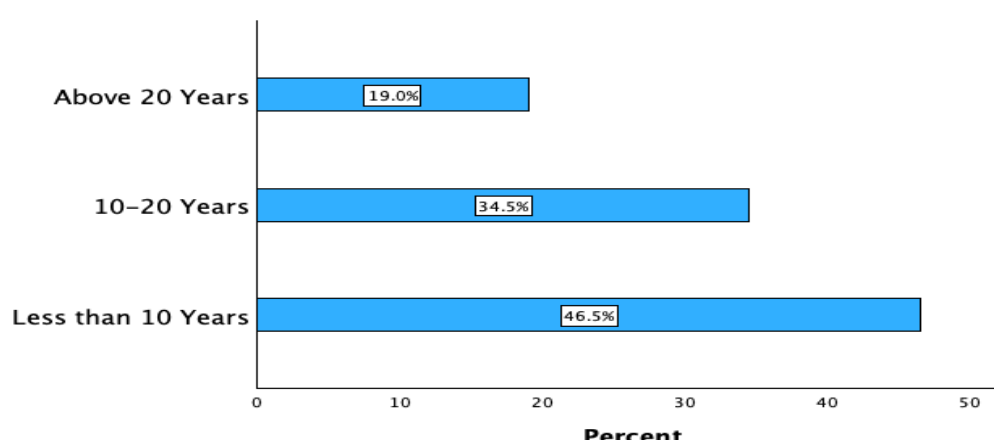
using descriptive statistical tools such as percentages and frequency distributions with the help of the SPSS software.

Results and Discussion

Practices in Eri sericulture and Traditional or Modern Practice

Figure 5.1.1 shows the percentage distribution of rearers according to their years of engagement in eri sericulture rearing. Most of the respondents 46.5% have less than 10 years of experience in eri sericulture, indicating that a large proportion of the rearers were relatively new to sericulture practices. Approximately 34.5% had 10–20 years of experience, while only 19% have more than 20 years of experience. This indicates the continuing expansion of eri sericulture as a livelihood activity in recent years.

Figure 5.1.1: Experience in Eri Sericulture



Source: Computed on the basis of field survey, 2024

Table 5.1.1: Methods of Rearing

Traditional or Modern Practice		
Practice	Respondents	Percent
Traditional	119	66.1
Modern	61	33.9
Total	180	100.0

Source: Computed on the basis of field survey, 2024



Table 5.1.1 presents the distribution of respondents who adhered to either traditional or modern practices. The findings reveal that 66.1% of the rearers followed traditional rearing practices, whereas 33.9% of them have adopted the modern methods of rearing. The predominance of traditional practices exhibits the continued relevance of indigenous knowledge systems in the area. Though, the use of modern techniques indicates that there is increase in the productivity.

Traditional Rearing Practice



Modern Rearing Practices



Traditional Weaving & Modern Weaving



a. Engagement across different stages of Rearing

5.2.1: Engagement across different stages of pre-cocoon to post-cocoon

Multiple Responses of Stages of Rearing of the Respondents			
Stages of Rearing	No. of Responses	Percent	Percent of Cases
Pre Cocoon Grainer	13	4.00%	7.20%
Pre Cocoon	179	55.40%	99.40%
Post Cocoon Spinning	5	1.50%	2.80%
Post Cocoon Self Use	52	16.10%	28.90%
Post Cocoon Sale Some	31	9.60%	17.20%
Post Cocoon Commercial	39	12.10%	21.70%
Post Cocoon Weaver at Cluster	4	1.20%	2.20%
Total	323	100.00%	179.40%

Source:Computed on the basis of field survey, 2024

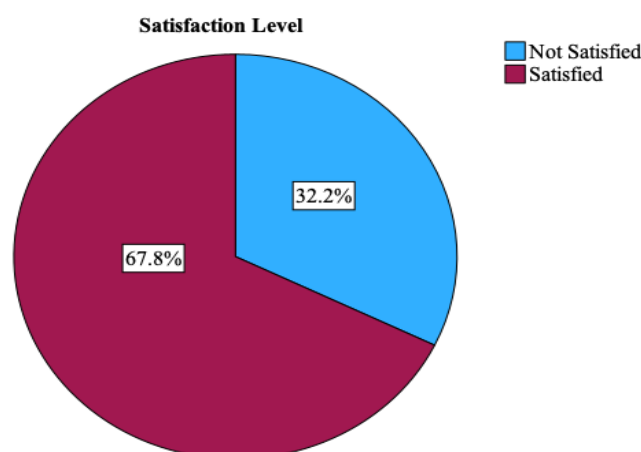
Table 5.2.1 presents the engagements of rearers at different stages of pre-cocoon and post-cocoon. Majority of the rearers are engaged in pre-cocoon which is 55.40%, followed by 16.10% who has produces the products just for self-consumption. Only 12.10% of them are producing for commercial purpose. In contrast, 59.40% are engaged until pre-cocoon stage, and only 40.0% are continuing until post-cocoon stage. There are various steps under the post-cocoon stage, and most rearers do not know weaving or lack the necessary equipment.

Effectiveness of training programme



Figure 5.3.1 shows the satisfaction level of the training received by the rearers. It is evident that majority of them 67.8% are satisfied with the training they received from the Directorate of Sericulture. While only 32.2% are not satisfied with the training they got.

Figure 5.3.1: Satisfaction level of rearers



Source: Computed on the basis of field survey, 2024

Role of IKS in Sustainable Sericulture

IKS provides a holistic framework for resource conservation, agricultural resilience, and community governance in sericulture. Practices such as crop rotation, organic pest management, and water conservation are deeply embedded in traditional sericulture, supporting ecological balance and sustainable livelihoods.

Socio-Economic and Cultural Dimensions

Sericulture is a significant source of employment and income, particularly for women and marginalized communities. Indigenous practices foster intergenerational knowledge transfer, community cohesion, and cultural preservation, while also enabling financial autonomy and skill development.

Integration of Traditional and Modern Practices

The integration of IKS with modern technologies-such as Artificial Intelligence (AI), the Internet of Things (IoT), and digital advisory tools-has enhanced productivity, climate resilience, and disease management in sericulture. Policy support, capacity building, and public-private partnerships are crucial for scaling these innovations.

Challenges and Barriers



Despite these benefits, challenges persist, including knowledge erosion, limited market access, inadequate infrastructure, and youth outmigration. There are also gaps in technical knowledge among farmers and barriers to mainstreaming IKS in formal education and policy frameworks.

Conclusion

This finding of the study demonstrates that Indigenous Knowledge Systems remain central to eri sericulture practices in the BTR, with the majority of rearers relying on traditional methods. However, limited engagement in post-cocoon activities and the partial adoption of modern techniques constrain the growth of this sector.

The integration of traditional knowledge with modern innovations, supported by targeted policy interventions, is essential for enhancing productivity, ensuring sustainability, and improving livelihoods. Strengthening institutional support and promoting value addition can transform eri sericulture into a more viable and resilient rural industry. The Directorate of Sericulture is also undertaking various steps, such as the Bodoland Sericulture Mission, Silk Samagra-2, and Capacity Building Programme, for the training of rearers in scientific rearing, seed production, and modern weaving techniques.

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