Socio-Economic Viability and Livelihood Impact of Ericulture among Rearers in Baksa District, Assam

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Abstract
Ericulture is deeply in Assam's Bodoland Territorial Region (BTR), integrating traditional practices with sustainable livelihood opportunities for tribal rural communities, especially women, over generations since time immemorial. This study aimed to examine the socio-economic characteristics of eri silk rearers, evaluate the economic viability and profitability of eri-culture, and identify factors influencing engagement in this activity in Assam's Baksa district. Primary data were collected using a multistage sampling method to survey 90 respondents across three subdivisions, six circles, and 12 villages. The data were analysed using the basic percentage method through cross-tabulation and cost-benefit ratio to assess profitability. The findings reveal that ericulture is female-dominated (97%), with the majority of rearers being middle-aged (65.56%) homemakers (86.67%). Ericulture rearing is profitable because of the low investment but high cost-benefit ratio, generating higher returns of 4.11. However, rearers currently face problems such as a lack of proper market linkages, inadequate technological transformations, and a scarcity of host plants for silkworms. Future research should focus on comparative studies across other districts of BTR to understand the full potential of ericulture. Furthermore, an in-depth analysis of the eri silk supply chain and an investigation of whether socio-cultural, educational, or economic barriers are preventing the adoption of ericulture technologies are needed.

Keywords: Ericulture, Economic Viability, Cost-Benefit Analysis, Rural Development, Bodoland Territorial Region

Introduction

Ericulture, an agro-based industry, involves the rearing of silkworms for silk production (Daimary, 2025; Kalita, 2025). Historical evidence shows that silk was first discovered in China, and the industry subsequently spread to other parts of the world (International Ericulture Commission, 2026). According to Brahma et al. (2019), ericulture can be broadly classified into two sectors: mulberry and non-mulberry silk. Mulberry silk is associated with the rearing of mulberry silk, whereas non-mulberry silk is associated with Eri, muga, and tasar silk, which are also known as Vanya silks. Daimary (2025) and Kalita (2025) and Sandeep Kumar et al. (2025) all confirm that ericulture remains a vital agro-based cottage industry generating employment and income for rural populations in Assam and India. However, in terms of contributions to employment and income generation, Eri and muga occupy prime positions (Kumar De & Das, 2010).

Ericulture is an important agro-cottage industry in Assam, India. This plays a vital role in transforming rural economies. Moreover, it is connected to the socio-cultural life of people. Narzary and Boro (2025) and Sharma et al. (2025) provided evidence that the agro-ecological conditions of Northeast India, such as high rainfall, humidity, and altitudinal diversity, are uniquely suited to eri and muga rearing. The climatic conditions of Assam's Bodoland Territorial Region (BTR) are favorable for rearing silkworms in the area. Eri silk is a legacy of Bodo and has been practiced as a part of its tradition and culture. Eri culture is an age-old practice closely associated with the rich heritage of Bodo culture (Sharma et al., 2025; Bhuyan et al., 2025). Assam's BTR has received the right to Geographical Indication (GI) for eri silk and its products. Economically, eri rearing offers low capital and income throughout the year, particularly to marginal farmers. A cost-benefit analysis also revealed that even small-scale operations can yield stable returns from eri and Vanya silk rearing with minimal environmental impact (Brahma & Basumatary, 2024; Gogoi et al., 2025; Lukoye et al., 2025; Kumar et al., 2026). Although women's participation in ericulture is evident, men are also interested in the art of rearing silk by actively participating directly or indirectly in helping their wives (V et al., 2025; Bhuyan et al., 2025). Eri silk rearing not only provides employment opportunities but also provides a path for the economic development of rural areas. Recent studies have highlighted that ericulture contributes significantly to rural employment generation, women's economic participation, and sustainable livelihood diversification in Northeast India (Reddy & Parasuramudu, 2024; Boro & Narzary, 2025). While rearing eri, rearers not only earn by selling the silk cocoons but also from the by-products, which are delicacies and a source of protein for the tribals in the region. In reality, they earn more from by-products, which is a source of double income (VP et al., 2025).

Despite its huge potential, there is a lack of micro-level studies, and the present literature lacks socio-economic outlining of eri rearers within this area (Sharma et al., 2025; Kalita, 2025). Although ericulture has a huge capacity, studies have identified various obstacles, such as inadequate market infrastructure, low technological adoption, and weak institutional support affecting productivity and profitability (Gogoi, 2023; Hosamani et al., 2024). Although various studies have been performed on ericulture in Assam and India in the field of women participation and empowerment, only a few studies have been conducted in the context of the economic viability and livelihood impact of ericulture in BTR, particularly in Baksa district. Additionally, existing studies have not adequately examined the cost-benefit analysis and factors influencing household-level engagement in ericulture. This study focuses on this gap in the context of ericulture, as it is the most preferred form of rearing among the respondents from the area.

Literature Review

Reddy et al. (2025) emphasized the dual practice of apiculture (beekeeping) and ericulture (silkworm rearing) as vital sectors for rural development, economic prosperity, and sustainability in modern agriculture. They highlighted that although both offer significant potential, they face substantial challenges, including pests, diseases, pesticide exposure in apiculture, silkworm diseases, labor shortages, and market fluctuations in ericulture, which must be addressed to ensure their sustainable growth.

Ekka and Bais (2023) revealed how ericulture provides occupational opportunities for tribal populations, aiming to shed light on its significance and discuss strategies for employment generation in the Indian ericulture industry. Ericulture was found to be a low-investment, high-return activity that provides significant employment (151-200 days for 74% of respondents), boosts annual income, empowers women, and reduces migration, thereby improving the socioeconomic conditions of rural and tribal communities.

Bobby Singh et al. (2025) analysed the economic impacts, sustainability, and gender roles of ericulture in the Aibawk Circle, Mizoram, and addressed why the practice was abandoned despite its potential. Ericulture provides only marginal economic benefits and supplementary income because of challenges such as low cocoon prices and a shortage of mulberry leaves. Although women were heavily involved

in labour, their decision-making power had not significantly improved.

Ericulture can be a pivotal tool in empowering rural women in India by reducing poverty and creating opportunities for sustainable development. Various strategies have been suggested, including integrated and women-exclusive projects, to improve their socio-economic status by addressing issues such as access to land, credit, and technology. Long-term consistent programs focusing on gender issues are necessary to empower women and recognize their significant contributions to ericulture and the rural economy (Yadav & Jadhav, 2017).

Savithri et al. (2013) examined the significance of the ericulture industry in India's sustainable rural economy, highlighting its cultural importance and role in poverty alleviation and employment generation for rural populations. The economic contributions of ericulture to rural livelihoods, its effect on agricultural diversification, and the influence of government policies on India's industry. The findings indicate that ericulture significantly boosts income, employment, and land-use efficiency, with strong support from effective government policies and training programs that enhance productivity and sustainability in rural communities (Reddy and Parasuramudu, 2024).

Gogoi (2023) indicated that while ericulture has grown the most because of its low cost and higher returns, the overall growth in both production and employment across all silk types has been unstable and hindered by challenges such as price fluctuations, lack of technology, and poor market infrastructure. Hosamani et al. (2024) found that ericulture farmers were middle-aged (50%), had high school education (60%), and medium-sized families (46%), but had a poor adoption rate for new technologies (46%), with the majority achieving medium cocoon yields (64%) and a low-to-medium benefit-cost ratio.

Boro and Narzary (2025) examined the socio-economic significance of Eri (Indi) ericulture for the Bodo community in Assam, highlighting its role in providing income, nutrition, and employment opportunities for women. They found that although eri ericulture is a dominant and culturally integral activity, it faces challenges such as market volatility and a lack of local value-added infrastructure. They also recommended practical interventions, such as strengthening producer cooperatives, investing in decentralized processing units, and empowering women through targeted training to enhance the resilience and profitability of eri-based livelihoods of Bodo households.

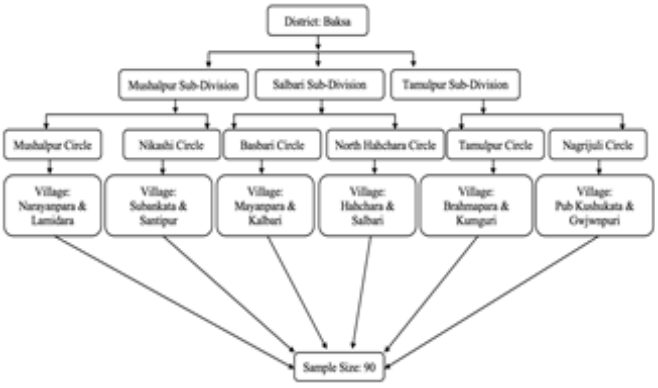
Objectives

- To examine the socio-economic characteristics of eri rearers.
- To evaluate the economic viability and profitability of ericulture.
- To identify the factors influencing engagement in ericulture.

Methodology

This study is based on primary data. Primary data were collected through surveys using a multistage sampling technique.

Study Area



This study examined the Baksa district in the Bodoland Territorial Region of Assam, covering all subdivisions: Mushalpur, Salbari, and Tamulpur. Ericulture circles from each subdivision were selected based on the number of seri-villages: one with the most and one with the fewest. Thus, six ericulture circles were selected: the Mushalpur and Nikashi circles from the Mushalpur Sub-Division, the Basbari and North Hahchara circles from the Salbari Sub-Division, and the Tamulpur and Nagrijuli circles from the Tamulpur Sub-Division.

Subsequently, two villages per ericulture circle were selected based on distance: one village near the circle and the other far away from it. Narayanpara and Lamidara villages from the Mushalpur circle and Subankata and Santipur villages from the Nikashi circle were selected. Again, Mayanpara and Kalbari villages from Basbari Circle, while Hahchara and Salbari villages from North Hahchara circle. Finally, Brahmapara and Kumguri villages from the Tamulpur circle and Pub Kushukata and Gwjwnpuri villages from the Nagrijuli circle were selected. In total 12, villages were selected for the study.

Sample Size

Eri rearers with more than 10 years of experience in ericulture were randomly selected from each of the 12 villages in Baksa district. Details about the rearers involvement with the silkworms were collected from the Ericulture Field Demonstrator. Hence, the overall sample collected for the study involved 90 respondents based on their involvement in rearing eri silkworms.

To ensure the reliability and validity of the study, a pilot survey was conducted with a small group of respondents before processing the final survey questionnaire. Necessary modifications were made to enhance the clarity and relevance of the questions. Cross-verification of information was conducted wherever possible during the field interactions.

Tools for Analysis

The collected data were analysed using the basic percentage method, and a cost-benefit ratio was constructed to check the profitability of ericulture activity through cross-tabulation in the Statistical Package for Social Sciences.

Results and Discussion

Socio-Economic characteristics of the Respondents:

Table 1 Percentage Wise Distribution of Rearers Involvement in Eri

Years	Frequency	Percentage
10	48	53.3
11-20	29	32.2
21-30	12	13.3
31+	1	1.1
Total	90	100.0

Source: Based on primary survey

Table 1 highlights that the majority of the rearers (53.3 %) have at least 10 years of involvement, revealing that over half of the respondents have been associated with silkworm activity recently or are relatively new. Meanwhile, 32.2% have between 11-20 years of experience in ericulture, presenting a moderate number of involvement. Again, 13.3% have 21-30 years of involvement, indicating a smaller group with long-term engagement. Only 1.1% had more than 31 years of involvement, indicating very rare cases with extensive disease involvement. Although new rearers are involved in eri, which is a good sign, the number of rearers is decreasing. The reason for declining involvement may be due to various obstacles, such as poor health or physical inability, and the ericulture scheme may not have reached them.

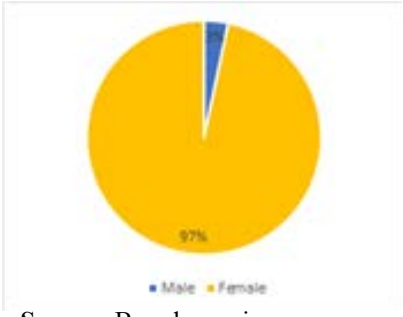
Table 2 Age-Wise Percentage Distribution of Rearers by Occupation

Age	Occupation				
	Homemakers	Service (Contractual)	Wage Labour	Self Employed	Total
< 35 Years	100.00	-	-	-	22.22

35-55 Years	101283.05	3.39	3.39	10.17	65.56
> 55 Years	81.82	9.09	-	9.09	12.22
Total	86.67	3.33	2.22	7.78	100.00

Source: Based on primary survey

Table 2 presents the age-wise distribution of eri rearers by their occupation. It was revealed that 86.67% of the rearers were homemakers, followed by 7.78% who were self-employed, comprising vegetable vendors and shop owners. In contrast, 3.33% of those employed as contractual government service workers were also engaged in eri-culture activity. Only 2.22% of wage laborers were engaged in ericulture because irregular work schedules limited their ability to participate in rearing activities. Furthermore, among the rearers, middle-aged individuals between 35-55 years held the prime position, accounting for 65.56% of the engagement in eri culture. The relatively lower participation of younger respondents (22.22% who are below 35 years of age) indicates declining youth engagement in traditional livelihood activities due to migration and changing occupational preferences. Only 12.22% of respondents from the age group of 55 years and above were still involved in rearing because it is difficult to give enough time in rearing as they are not in their prime health condition.



Source: Based on primary survey

Figure 1 Gender of the Rearers

Figure 1 shows the gender-wise distribution of eri rearers. It is clear that majority of the rearers 97% are female showing the dominance of women in the sector. While, only 3% are male showing that now even male are taking up eri rearing as medium of livelihood.

Economic Viability and Profitability of Ericulture

Table 3 Analysis of Cost-Benefit Ratio of Eri Rearers Per Month/Per Rearing

Categories	Total (Rs.)	Min (Rs.)	Max (Rs.)	Average (Rs.)
Gross Return	1219260	4800	33200	13551
Cost of Rearing	238699	240	11360	2652
Net Return	980921	4512	24320	10899
B:C Ratio	4.11	18.80	2.14	4.11

Source: Based on primary survey

Table 2 presents the analysis of the cost-benefit ratio of eri rearers per month or per rearing, the findings of which suggest that the minimum returns and costs result in the highest benefit–cost ratio of 18.80, showing greater efficiency and higher returns per unit cost. In contrast, the maximum returns and costs yield a lower benefit–cost ratio of 2.14, indicating reduced efficiency. For total and average returns and costs, the benefit–cost ratio of 4.11 suggests moderate profitability and overall economic sustainability of eri rearing.

Table 4 Analysis of Rearers Total Cost and Total Revenue

Total Cost	Total Revenue			
	< 10000	1000-20000	> 20000	Total
< 2000	74.51	25.49	-	56.67
2000-5000	34.78	56.52	8.70	25.56
> 5000	6.25	56.25	37.50	17.78
Total	52.22	38.89	8.89	100.00

Source: Based on primary survey

Table 4 presents the crosstab analysis of the total cost and revenue earned from ericulture. The majority of rearers 52.22 % earned revenue below 10000, followed by 38.89% who earned between 10000-20000, and the least were 8.89% who earned more than 20000 per month per rearing from

ericulture. The majority of the rearers are investing below 2000, which is 56.67% because most of them were homemakers, followed by 25.56% who invested amounts above 20000-5000, and the least number of investors 17.78 % invested above 5000 or more.

Factor Influencing Engagement in Ericulture

Table 5 Reason for Choosing Eri Rearing

Occupation	To meet financial needs To mitigate unemployment	To mitigate unemployment	Love rearing	Total
Homemaker	47.44	51.28	1.28	86.67
Service (Con-tractual)	33.33	-	66.67	3.33
Wage Labour	-	100.00	-	2.22
Self Employed	57.14	42.86	-	7.78
Total	46.67	50.00	3.33	100.00

Source: Based on primary survey

Table 5 presents the reasons cited by eri rearers for selecting ericulture as part of their livelihood. A majority, specifically 50%, chose ericulture to mitigate unemployment. Additionally, 46.67% have opted for eri to meet the demand of financial needs. Furthermore, 3.33% have chosen eri rearing out of a passion for the activity. Among the rearers, 86.67% are homemakers who have adopted ericulture as their occupation. This was followed by self-employed, who constitute 7.78% of the rearers, having turned to ericulture as an additional source of income. Additionally, 3.33% of the contractual service job holders are also engaged in it because of job insecurity. The smallest group, comprising 2.22%, consists of wage laborers, they work for different individuals and they lack sufficient time for rearing activities.

Suggestions

The following suggestions are proposed for the betterment of the eri rearers:

Proper Market Linkages and Infrastructure

There is a lack of proper market linkages in the area, because of which the rearers are exploited by the middleman. Further, more there are transportation issues; hence, they are not able to explore outside the area.

Capacity Building Programme

The rearers, who are mostly homemakers (women), should be given technological training on how to cope with modernisation in rearing so that they are empowered.

Expanding Host Plant Cultivation

To meet the shortage of host plants, the government is giving importance to Eri Host plantation development for eri silkworm rearers through the Bodoland Eri Mission.

Improving the Reach of Government Schemes

Although schemes are already available to rearers, their reach is limited. Therefore, the field demonstrator of the area should create an awareness programme to ensure equitable distribution of the scheme which will ensure rearers prosperity and women's economic sovereignty in the area.

Conclusion

The findings revealed that eri ericulture in the Baksa district of Assam's BTR is a viable livelihood strategy with positive socio-economic impacts. Ericulture offers a sustainable solution to rural unemployment, generates sizable income, and plays an essential role in the socio-economic uplift of rural families by transforming the rural economy in the Baksa district. Owing to its low investment and high returns, it is suitable for rural women, especially homemakers or wage workers. However, they are unable to utilize the full potential of ericulture because of the lack of proper market linkages and technological upgradation. In fact, there is a lack of host plants to feed eri silkworms when it is practiced throughout the year. Although various schemes are already available, their benefits have not reached all rearers. Hence, the Directorate of Ericulture should take essential steps to improve the livelihoods of rearers to enhance rural prosperity and women's economic sovereignty in the Baksa district.

Therefore, strengthening institutional support, technological access, market integration can substantially enhance the sustainability and income-

generating potential of ericulture in rural district of Baksa. This study focused only on the rearers of Baksa district; therefore, future researchers may conduct comparative studies across other districts in BTR. To identify the full potential of ericulture, an in-depth study focusing on analysing the eri silk supply chain may be conducted. As the rearers are not adopting technological upgradation, a future researcher can investigate the socio-cultural, educational, or economic barriers preventing them from adopting new ericulture technologies.

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