



Weaving Biodiversity: The Interwoven Heritage of Eri Textile and Ecological Sustainability in Assam

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ABSTRACT

This study explores the interwoven heritage of *Eri* silk weaving and its role in biodiversity conservation in the state of Assam. *Eri* silk, also known as *ahimsa* silk, is eco-friendly and non-violent in production. Eri culture is the traditional practice of rearing Eri silkworms, which has existed for a long time in Assam. Eri silk weaving was practiced by the ethnic communities of Assam, such as the Boros, Kacharis, Misings, Karbis, etc. The weavers are now creating Eri silk fabrics that are in high demand, not only in India but also internationally.

The traditional practices and indigenous knowledge systems associated with Eri silk weaving and the cultivation of castor plants—the primary food for Eri silkworms provide a sustainable way the use of natural resources and also contribute to sustainable livelihoods. It leads to the socio-economic well-being of local communities and the sustainability of biodiversity. It can serve as a model for biodiversity-based sustainable livelihoods, contributing towards economic development. It also helps conserve biodiversity through sustainable agroforestry and organic farming, which enhances the soil and increases plant diversity. Modernisation and changing market dynamics has impacted the traditional Eri silk practices and the associated biodiversity, including shifts in land use, plant species cultivation, and silkworm-rearing methods.

This paper aims to document traditional practices, assess the ecological impact of *Eri* silk production, and examine its potential for biodiversity-based sustainable development based on interviews, surveys, and environmental assessments to gather data from weavers, farmers, and community leaders. Eri silk weaving provides crucial livelihoods, particularly for women, reinforcing socio-economic stability. However, challenges such as habitat loss and reduced transmission of traditional knowledge due to modernisation can be observed. Integrated policies promote biodiversity conservation and sustainable livelihoods, ensuring local communities' resilience and cultural heritage preservation.

Keywords: *Traditional Knowledge, Plant Diversity, Biodiversity Conservation, Ethnic Communities, Sustainable Process, Cultural Heritage*



INTRODUCTION

Eri culture is the traditional practice of rearing *Eri* silkworms, which has existed for a long time in Assam. *Eri* silk weaving was practiced by the ethnic communities of Assam, such as the Boros, Kacharis, Misings, Karbis, and others. This paper discusses the basic details of *eri* silk manufacture and process. The eco-friendly sustainable process that ensures cultural heritage preservation and environmental integrity is central to *Eri* silk production. In contrast to the conventional form of silk production, *Eri* silk is known as "peace silk" or ahimsa silk because the silkworms are not harmed in any way during the silk extraction process. The extraction is carried out after the silkworms leave the cocoon. It emphasises how *Eri* silk production contributes to sustainable livelihoods and promotes biodiversity conservation. It helps in preserving indigenous practices of the communities that have evolved over a long period of time and encouraging specific techniques of eco-conscious textile manufacturing.

The ecological systems and socio-political processes focus on how traditional *Eri* silk practices relate to sustainable resource management and cultural heritage. This paper will discuss the role of local governance and policies in supporting or hindering sustainable silk production. It will analyse the knowledge systems of ethnic communities like the Boros, Kacharis, Misings, and Karbis and highlight how their traditional weaving techniques and biodiversity-conscious approaches to *Eri* culture align with broader ecological sustainability goals. It will also investigate the role of women in the traditional production and weaving of *Eri* silk and discuss how their involvement links to preserving cultural heritage and ecological balance.

This approach focuses on livelihoods and their dependence on natural, human, and social resources in a sustainable way and also examines how *Eri* silk production contributes to the sustainable livelihoods of indigenous communities. It will attempt to understand the intimate relationship between people and their environment, particularly using biological resources, and analyse the interaction between the ethnic communities and plant diversity. It will also investigate the ways in which the ethnic communities' silk-weaving practices have adapted to Assam's biodiversity and discuss the mutual influences of how culture and ecology



impact each other. There is a much-required need for the integration of ecological sustainability into economic practices. The Eri silk industry provides a model of a circular economy, showcasing its waste-free and eco-conscious production processes that contribute to broader sustainable development goals.

The traditional technique of *Eri* silk weaving and the cultivation of castor plants provide the main food for *Eri* silkworms which is based on our rich Indian knowledge system. These practices show a deep understanding and emphasise on living in a harmonious way with nature, as seen in ancient texts like the *Vrikshayurveda* (science of plants). They highlight the use of the natural resources in a judicious manner, ensuring that the environment is enriched rather than harming it in anyway.

Organic farming and agroforestry techniques used in these practices improve soil health and increase plant diversity. This reflects the Indian idea of *Vasudhaiva Kutumbakam* (the world as one family), which highlights the connection between people and nature. However, modernisation and market changes have impacted these traditional practices in a number of ways. By preserving and adapting these ancient practices, we can create sustainable livelihoods while protecting the environment and promoting economic growth.

Traditional Practices and Process of Production involved

Eri silk is also referred to as *ahimsa* silk and follows a unique production process as it does not involve killing the silkworm. The lifecycle of the *Eri* silkworm (*Samia ricini*) firstly begins with the careful cultivation of the castor plants, which is their primary food source. The weavers collect the cocoons only after the moths emerge naturally and this process is ecologically viable. During the degumming process the softening of the outer layer of the cocoon is carried out using traditional techniques which are passed down through generations. The spinning process is mainly done by hand by creating threads that are then woven into textiles. The artisanal approach highlights the intrinsic connection between the weavers and their natural environment.

Women play a significant role throughout the Eri weaving process as they are mainly engaged in rearing the silkworms, extracting the fibres from the cocoon, spinning the yarn,



and in the weaving of the fabric. It is a labour-intensive activity that contributes to household income and also reinforces their status as custodians of traditional knowledge forms and craftsmanship. In the present times, despite the impact of modernisation, women's expertise remains vital, though they often face challenges such as limited access to resources, markets, and decision-making platforms.

The Northeastern region has a rich biodiversity, and Eri silk production depends on the rich biodiversity of this region. The Castor plant, which is the primary food for the Eri silkworms, is often intercropped along with the other crops that support sustainable agricultural practices. The Northeastern region is losing its natural habitat due to increasing deforestation and process of urbanisation, like construction of roads and building activities, which is encroaching into the biodiversity supporting Eri cultivation. Traditional practices emphasise maintaining the ecological harmony, but modern agricultural interventions sometimes disturb the existing balance where development takes place at the cost of losing this rich biodiversity. Restoring local flora and promoting agroforestry are crucial steps for mitigating these impacts and sustaining Eri silk production. The promotion of Integrated Farming Systems, preserving the natural flora and fauna, farming, animal rearing and Eri weaving are carried out in a synergised manner.

Gram Sabhas plays a vital role in the management of resources essential for Eri silk cultivation at the community level. Through the regulating of land use, ensuring equal access to castor plants, and collective decision-making, Gram Sabhas contribute to preserving both the environment and the socio-economic fabric of the community. They also provide a platform for the exchange of knowledge between community members and experts, which helps to bridge the gap between traditional practices and sustainability goals for the future. Eri silk weaving provides livelihoods, especially to women, leading to socio-economic stability within rural communities. Its production supports small-scale enterprise and economies based on community initiatives while preserving the cultural heritage. However, challenges such as habitat loss and the reduced transmission of traditional knowledge due to modernisation can be observed.



Eri Silk: An Eco-Friendly sustainable tradition of Assam.

Eri silk is a unique part of India's cultural and ecological heritage. This distinct silk has deep roots in the cultural heritage of Assam, where it has been woven into the lives of communities for generations. Historical texts like the *Arthashastra* emphasise the importance of silk in the economic and cultural frameworks of ancient India, indirectly highlighting its legacy as a valuable resource. In Assam, Eri silk weaving is more than a craft; it is a way of life deeply embedded in the traditions of ethnic groups such as the Bodos, Kacharis, Misings, and Karbis. These communities have developed and preserved intricate weaving techniques, which reflect the artistic sensibilities and also the sustainable interactions with the environment. In the manufacturing of Eri, it has been observed that there is a symbiotic relationship between human beings and the environment, as it is a sustainable and ecologically viable practice.

The castor plant is the food source for Eri silkworms and survives on minimal resources and Castor (*Ricinus communis* Linn.) and Kesseru (*Heteropana Fragrans* Roxb.) are the principal host plants for *eri* silkworms. In addition to these two, the *eri* silkworm is also capable of devouring 29 different types of plants and is categorised based on silkworm preferences into primary, secondary, and tertiary host plants. The northeastern states are teeming with most food plants of the *eri* silkworm, except for a few tertiary host plants. It is common to find castor plants on roadsides, by the sides of railway tracks, riverbanks, hilly tracts, and even on wastelands. They support the local ecosystem by preventing soil erosion and also provide habitats for the survival of other organisms. As opposed to conventional silk production, Eri silk is harvested in a non-violent manner, often allowing the moths to emerge naturally from their cocoons (Mahesh et al. 2024).

This creates a livelihood for people while ensuring that nature's balance is maintained. The weaving is done manually, and natural dyeing techniques are associated with Eri silk, further reducing the carbon footprint and demonstrating how human activities can align with natural processes to create a sustainable and mutually beneficial relationship. This paper explores the multidimensional significance of Eri silk weaving, exploring its role in biodiversity conservation, sustainable livelihoods, and socio-economic well-being of the



communities. It investigates how this traditional practice sustains rural communities, especially women, while simultaneously contributing to ecological balance.

The research methodology followed included interviews and field observations with weavers, farmers, and community leaders in order to document their experiences and knowledge of Eri production. A significant part of the study was the documentation of indigenous knowledge systems, which encompass sustainable agroforestry practices and traditional weaving techniques. The cultivation of castor plants, an essential element in *Eri* silk production, was particularly significant as it promotes soil fertility, supports plant diversity, and integrates seamlessly into agroforestry systems.

However, the practice also faces many threats and challenges from various fronts. Modernization and urbanisation have led to the loss of habitat, and there have been shifts in traditional land use and the decline of traditional knowledge systems. There has also been a great influx of cheaper, synthetic alternatives that are a significant threat to the sustainability of this craft. *Eri* silk weaving demonstrates immense potential as a model for biodiversity-based sustainable development. By promoting traditional practices, supporting local markets, and incentivizing sustainable agroforestry, policymakers can ensure the survival and growth of this eco-friendly craft. The weavers need to create a balance between the preservation of cultural heritage and ecological sustainability, as it not only provides livelihoods but also strengthens community resilience and contributes to environmental conservation. This legacy, deeply rooted in Assam's cultural and ecological landscape, offers a blueprint for harmonising development with sustainability.

The cocoons of wild silkworms are called *Eri*, *Endi*, or *Erandi*, which are only harvested after the moth has emerged out of them. The castor oil plant, or era in Assamese, which the *Eri* silkworm (*Philosamia ricina*) typically feeds on, is the source from which it derives its name. *Eri* silk does not form into a continuous filament because the cocoon is open at one end and is then spun and reeled into yarns. A number of ethnic groups of the Brahmaputra Valley and the surrounding hills have long maintained their *Eri* silk tradition as a subsidiary occupation.



The only silk-making technique that does not require the killing of silk moths to make yarn from their cocoons is the manufacturing of Eri silk. The weavers find it convenient to let the moths emerge on their own. Eri silk is therefore also referred to as Ahimsa, or non-violent silk, which is characterised as silk yarns made without killing the moths within their cocoons or going against the natural law of "live and let live." Thus, only open-mouthed or perforated cocoons can be used for the manufacturing of non-violent silk (NVS) (Mazumdar 2013).

According to Chowdhury (1982), the main regions in Assam for producing *eri* silk cocoons are the districts of North Cachar and Karbi Anglong Hills, Kokrajhar, Goalpara, Barpetta, Nalbari, Kamrup, Darrang, and Sonitpur. Many of the districts in upper Assam also produce Eri silk. The weavers use few cocoons they generate to make wrap-arounds or shawls of different sizes, which are mostly needed for use for domestic purposes within the family. Eri silk is a thick, cold-resistant fabric suitable for warm winter clothing. Eri silk is considered the silk of the poor due to its resilient nature and coarse fabric. An old Assamese saying, "*dair pani, erir kani*," which suggests that although curd cools, *eri* clothing warms people, is a good way to measure the status of *eri* clothing in Assamese folk culture (Allen 1899).

The *eri* silk, which is a rare variety of silk, is treated without killing the silkworm and is one of the most interesting of Assamese silk's many varieties. Due to this unique feature, this peace silk is a particularly popular fibre among Buddhists and vegans. As part of their everyday routines, rural and tribal women have historically processed, spun, and woven materials. After that, it begins spinning its cocoon, which takes another fifteen days. The silkworm, a rich source of protein, is considered a delicacy and is consumed after the moth emerges from its cocoon. After the process of degumming by boiling in water, the empty cocoons are formed into little cakes that appear like cotton pads and are then tossed against the mud buildings to dry. After the cakes have dried, they are spun in a manner similar to that of spinning wool (The Textile Atlas, Accessed December 8, 2024).

M'Cosh (1828) in his account he refers to:

Three principal varieties of silk are manufactured, called *Path*, *Moonga*, and *Indy*..... The *Indy* is of the coarsest quality of all and is used only by the poor; the worm from which it is obtained feeds on the leaves of the castor-oil plant. All of these silks



are of domestic manufacture and are woven at leisure hours by the women of the family. The well-off families own three to six looms.

The findings reveal that Eri silk weaving plays a crucial role in empowering the women in the rural areas by providing them with a stable income in the absence of other livelihood opportunities. For many families, *Eri* silk production has reduced rural unemployment and curbed migration to urban areas. The eco-friendly nature of Eri silk production also ensures minimal disruption of the ecological system and helps in preserving habitats and in the promotion of biodiversity.

Assam in the Ahom Age

During the Ahom era, silk cocoons were prepared for silk manufacturing for use. They were exposed to sunlight to destroy the chrysalis. Once ready, a score of cocoons would be immersed in a pot of scummy water and stirred with a bamboo splinter. The silk threads would attach to the bamboo, which was then used to reel the thread. If bamboo failed, then a twig of the *Makundi* creeper was used instead. The cocoons, naturally bright yellow, would turn white when boiled in potash water. A coarser thread called *lat* was spun from breeding cocoons after the moths escaped, and the refuse of reeled cocoons was used. Silk production was traditionally restricted to the *Jugi* caste, who were also known as *Katani*, and they were the suppliers of silk to the Ahom kings.

Tussar, which was once cultivated during Assam's golden age of silk, is now neglected for being inferior to Muga. The Tusser silkworm, known as *Kutkuri*, primarily feeds on the *Kutkuri* plant (*Vangueria spinosa*) and occasionally on the *Phutuka* plant. It yields three broods annually, compared to Muga's five. A wild silkworm, *Salthi* (reared by the Kacharis), feeds on *Kamranga* (Barringtonia) and *Hidal* trees. Silk from these worms was often mixed with *Eri* silk. The cocoons were prepared by exposing them to sunlight or fire to kill the chrysalis. They were boiled in an alkaline solution to soften the silk, which was then spun into coarse threads. Non-Aryan tribes in Assam, particularly in submontane areas, still practice *Eri* rearing and spinning. Bhutanese traders imported large quantities of *Eri* yarn, dyed and wove it into colourful garments, which were sometimes resold in Assam.



Future Prospects of Eri

Based on an interview of a weaver from Dhubri district in Assam, who has been engaged in weaving for the past twenty-four years. “My name is Anup Rai. I am a weaver from Halakura, Dhubri district. I have been working since 2000, and I learned weaving in Kolkata, where I worked till 2007. After that I established a handloom at home. When I first started working in Kolkata, I learnt how to produce cotton sarees. Then I learnt how to make Bodo Dokhonas, and now I work on Mekhela Chadars. I had eight handlooms at my place, but now I am working in Guwahati (at designer Enakshee Barua’s office). I had to close the handlooms at my place.” On the rise of duplicate textiles, he said:

“I have worked with Eri silk a lot. Nowadays there are a lot of duplicate threads in the market that are sold as Eri silk. Usually those who know can tell that it is duplicate and not original, but many weavers and traders sell this cloth as original. A duplicate Eri cloth does not have the shine or quality of the original one, and there is a texture that is only seen in the original. I also work with *Muga* and *Kesa Paat* and other types of silk. One can tell by burning a *Kesa Paat* silk; an original one will burn and turn into ash, while a duplicate silk cloth will melt like plastic.

In Dhubri, there are a lot of handlooms, and many people use duplicate threads on original weaves, and then in the market they sell them like they are original pieces. Many people buy these thinking they are authentic silk textiles. One of the reasons so many weavers are doing this is because the price of these duplicate threads is lower in comparison to the original ones. If one buys duplicate threads for Rs 500, the original will not be available even for Rs 5000. The production cost goes significantly lower. If an original cloth takes Rs 1000 to be made, they are able to produce 7-8 such pieces within Rs 500. That is why so many weavers do this. A lot of traders in Dhubri, Kokrajhar, and Pathshala do this.”

On the challenges faced by weavers, he said:

“I have not received any help from the government. I have two Handloom Certificates, and I still have not received anything. I have submitted my documents and was told that I would get a loan, and even after that I did not receive any loan. I submitted my documents one more



time when the Handloom office said that we would receive a house to establish a loom in, but I never heard back from them. Most people around me have also never received any help. Since 2007, when I established the looms in my house, I have also taught around 15-20 more people to weave. I have also helped set up looms in their houses, but there has been no government aid for any of us. There has been no help at the individual level”.

“If we got aid from the government and loans, then it would have been really beneficial for us. I would have been able to work from home; I would have restarted my looms. When I go to Guwahati to work, I leave behind my wife and children. I would have been able to help them on a day-to-day basis. Every month I have to travel to and fro. I could have picked up and dropped off my children from school. Now I cannot do any of that.”

On sustainability of the craft he said that “I have taught around 20 young workers the craft of weaving so that the next generation can carry this forward. I would teach a weaver on my own loom for about three months and then give him a salary so that he could work with me. It wasn’t a lot of money, but I would help him as much as I can. And then I would buy his clothes and sell them in the market so as to help him, and both of us would be able to earn money from it. Even my wife and kids helped me when I worked on my own loom. If a loom is left inactive, it will get spoilt, and then to repair it, a lot of time goes to waste. Once repaired, the machine lasts for 6 months to a year, given how you use it. In my 24 years, I have mastered everything—from setting up to running the loom, every stage of the craft.

“The weavers I have taught have been able to continue their work on the looms we set up. So I am happy with that. I don’t think that in 20-50 years this craft will go extinct. It will definitely continue. There are many power looms around us where textiles are made by machines. But once someone strikes or refuses to work, the power looms can get shut down. But no one can ever stop the work of a handloom. The craft of the hand can never be stopped and will continue to go on” (Translated from Assamese by Antara Kashyap, field investigator).

The Way Ahead

Eri textile weaving is an example of biodiversity-based sustainable development. Well-planned initiatives, as this traditional textile craft has the ability to achieve many goals. Lastly, it can play a crucial role in supporting policymaking for the future. In Assam, Eri silk weaving



remains a deeply valued tradition, but its future prospects depend on finding solutions to face the threats posed by modernisation and market pressures. To ensure its sustainability government support is essential, including subsidies and training programmes needed for weavers at the grassroots level. Creating awareness among the younger generation about the ecological and cultural importance of traditional practices is also important. Incentivising sustainable agroforestry practices is vital in order to preserve biodiversity and maintain healthy ecosystems. By integrating the preservation of cultural heritage along with ecological sustainability, Eri silk can continue to be a symbol of Assam's cultural richness while offering a model for sustainable development globally and has rich prospects to bring about a Viksit Bharat in 2047. It also gives the opportunity to reduce carbon footprint, which gives it a unique advantage. The Eri textile needs a makeover of the image of the fabric of peace through its transformation from a 'poor man's silk' to 'a sought-after luxury textile.'

The balance between *Eri* silk weaving and the ecology of Assam is based on co-existence, resourcefulness and cultural resilience. The heritage of *Eri* silk also termed as 'ahimsa' or 'peace' silk, showing its role in biodiversity conservation, sustainable livelihoods, and the socio-economic well-being of numerous ethnic communities in Assam. The findings indicate a model for biodiversity-based on sustainable development, which is in contrast to conventional industrial practices and offers insights for a future towards a 'Viksit Bharat' by 2047. It emphasised the deeply ingrained nature of Eri culture within the ethnic fabric of Assam, particularly among the Boros, Kacharis, Misings, and Karbis. The traditional practice of Eri silk production reflects a deep understanding of natural cycles and sustainable resource management. The study emphasised the symbiotic relationship between human beings and the environment, where the cultivation of castor plants, the primary food source for Eri silkworms, seamlessly integrates into agroforestry systems. These practices not only provide sustenance for the silkworms but also contribute to soil fertility and increased plant diversity, demonstrating a circular economy model that minimises waste and enhances the natural environment. Anup Rai also talks about the lack of government support for weavers and the struggle against duplicate textiles is a stark reminder of the vulnerability of this traditional craft in the face of modernisation and unchecked market forces. His unwavering belief in the handloom's resilience "no one can ever stop the work of a handloom" is inspiring but there is also a need for external support.



This could assist the weavers to get raw material, upgrade their looms, improve their standard of living and reduce their dependence on synthetic textiles. There is a need for workshops on natural dyeing and efficient production techniques. Community-level infrastructure such as common facility centres for degumming, spinning, and collective marketing can reduce individual burden and improve efficiency. A certification system can authenticate Eri silk products from Assam. This could help to deal with the problem of duplicate textiles, protect consumers, and ensure fair prices for legitimate weavers. Promote a strong brand identity for Assamese Eri silk in national and international markets, emphasizing its "peace silk" and eco-friendly attributes.

The policy gaps and pursuing further research Eri silk can transcend its image as the "poor man's silk" and emerge as a truly "sought-after luxury textile." This transition is not merely about market value but about recognising and reinforcing the profound ecological wisdom and cultural heritage it embodies. The "peace silk" of Assam has the potential for sustainable development, harmonising economic growth with environmental preservation and provides a model for a future where tradition and modernity to create a vibrant and equitable society. The story of *Eri* silk is a testament to the enduring power of human ingenuity when deeply rooted in respect for nature a narrative that deserves to be championed on the global stage.



REFERENCES

Allen, B.C., Allen, C.G.H., Gait, E.A, and Howard, H. F. *Gazetteer of Bengal and North-East India*. New Delhi: Mittal Publications, 1979.

Baker, Lisanne de. "Eri Silk – A Peaceful Silk in Assam, India." *The Textile Atlas*. Accessed December 8, 2024. <https://www.thetextileatlas.com/articles/eri-silk-a-peaceful-silk-in-assam-india>.

Boruah, Sunita, and B. Baishya Kalita. "Eco-printing of Eri Silk with Turmeric Natural Dye." *International Journal of Textile and Fashion Technology (IJTFT)* 5 (2015): 27.

Fletcher, Bainbrigge T. *Memoirs of the Department of Agriculture in India: Entomological Series*, Vol. IX. Calcutta: Government of India, 1929.

Mahesh, D. S., D. S. Jigyasu, Shabnam Jigyasu, and A. A. Mahesh. *Handbook of Eri Culture*. Jorhat: Central Muga Eri Research and Training Institute, 2024.

"The Song of Eri Silk: Woven on Hope and a Prayer, Eri Silk Needs the Spotlight More Than Ever." Accessed April 4, 2024.

Mazumdar, L. *Textile Tradition of Assam: An Empirical Study*. Guwahati: Bhabani Books, 2013.

M'Cosh, J. *Topography of Assam*. Delhi: Sanskaran Prakashan, 1837.