



POPULAR SCIENCE ARTICLE

Sericulture and Sustainable Pathways in Assam

Himadri Rabha¹, Pallavi Deka*¹, Chayanika Nath²

¹Krishi Vigyan Kendra, Assam Agricultural University, Udaguri, Assam-784514

²Krishi Vigyan Kendra, Assam Agricultural University, Darrang, Assam-784146

*Email: pallavi.deka@aau.ac.in

Abstract

Sericulture has been an integral component of the agrarian and cultural landscape of Assam for centuries. The state is uniquely positioned in India due to its natural endowment of diverse agroclimatic conditions that support the production of mulberry silk, muga silk, eri silk and tasar silk. In recent decades the concept of sustainability has gained prominence in agricultural and allied sectors including sericulture. Sustainable development of sericulture in Assam implies a balanced integration of economic viability environmental conservation and social equity while ensuring long term productivity and livelihood security. This article elaborately examines the present status of sericulture in Assam its ecological and socioeconomic significance major constraints and emerging opportunities under the sustainability framework. Emphasis is placed on resource efficient production systems biodiversity conservation climate resilience technological interventions institutional support and policy initiatives.

Key words: Sericulture, sustainability, livelihood, biodiversity, climate, technology, policy

Introduction

Sericulture refers to the cultivation of silkworms for the production of silk and is one of the most labour intensive and environmentally compatible agro based industries. In India sericulture occupies a unique position as it combines agriculture cottage industry and culture into a single economic activity. Assam is the only state in the world where all the four major varieties of silk namely mulberry, muga, eri and tasar are produced commercially. Among these muga silk holds exceptional cultural and geographical significance as it is endemic to the Brahmaputra valley and has received geographical indication status.

The concept of sustainable development gained global recognition after the Brundtland Commission report which emphasized meeting the needs of the present without compromising the ability of future generations to meet their own needs. In the context of sericulture sustainability encompasses environmentally sound production practices, economically viable livelihoods and socially inclusive development. Assam with its high rural population dependence on agriculture small landholdings and rich biodiversity presents an ideal setting to promote sustainable sericulture.

However, despite its potential sericulture in Assam faces multiple challenges including low

productivity, climate variability, pest and disease incidence inadequate infrastructure limited access to quality inputs and weak market linkages. Addressing these challenges through a sustainability lens is essential to revitalize the sector.

Sericulture scenario in Assam

Sericulture in Assam is predominantly practiced by small and marginal farmers using traditional methods. Eri and muga silk are particularly important due to their adaptability to local conditions and low requirement of intensive inputs. Eri culture is often considered a poor man silk due to its suitability for indoor rearing and its role in providing supplementary income and nutrition through eri pupae consumption. Muga culture on the other hand is deeply embedded in Assamese culture and rituals and is primarily practiced in outdoor conditions on som and soalu host plants.

According to the Central Silk Board India, Assam contributes significantly to the national production of eri and muga silk. However, productivity per unit area and per disease free laying remains lower than national averages especially in mulberry sericulture. This productivity gap underscores the need for sustainable technological and management interventions.

Environmental sustainability and biodiversity conservation

One of the strongest attributes of sericulture is its ecofriendly nature. Host plants used in sericulture such as mulberry som castor and arjun contribute to soil conservation carbon sequestration and microclimate regulation. In Assam, muga and eri sericulture are closely linked with forest and agroforestry systems which support biodiversity conservation. Sustainable sericulture practices encourage the conservation of native host plant species and associated fauna.

However unsustainable practices such as indiscriminate use of chemical pesticides deforestation and monocropping can threaten ecological balance. Adoption of organic sericulture integrated pest management and conservation of natural enemies are essential strategies for environmental sustainability. Organic management in eri culture improves soil health and enhances cocoon quality while reducing environmental pollution.

Climate change poses an emerging threat to sericulture in Assam through altered temperature rainfall patterns and increased frequency of floods. Sustainable development therefore requires climate resilient practices such as selection of tolerant silkworm breeds diversified host plant systems water management and early warning systems.

Economic viability and livelihood security

Sericulture is a source of regular income due to its short production cycle and high labour absorption capacity. In Assam, it plays a critical role in livelihood security particularly for women and landless households. Sustainable sericulture emphasizes value addition efficient resource use and market access to enhance profitability.

Traditional silk products of Assam such as mekhela chador and eri shawls have high market demand due to their cultural value and ecofriendly appeal. Strengthening value chains through improved reeling weaving dyeing and branding can significantly increase income for producers. Value addition at the village level can increase net returns from sericulture by more than forty percent.

Access to credit insurance and institutional support is another critical aspect of economic sustainability. Farmer producer organizations and self-help groups can play a vital role in collective input procurement processing and marketing thereby reducing transaction costs and risks.

Social sustainability and women empowerment

Social sustainability in sericulture relates to equitable participation preservation of traditional knowledge and improvement in quality of life. In Assam women constitute a major share of the sericulture workforce particularly in eri spinning and weaving. Sustainable sericulture initiatives have the potential to empower women through skill development income generation and decision making roles.

Traditional knowledge related to host plant management silkworm rearing and weaving techniques is a valuable asset that needs to be integrated with modern scientific approaches. Community based extension models participatory research and capacity building programs can enhance social inclusion and knowledge exchange. As highlighted by Hazarika *et al.*, (2023) community participation is crucial for long term sustainability of sericulture programs in Northeast India.

Technological interventions for sustainability

Technology plays a pivotal role in enhancing productivity and sustainability of sericulture. Development and dissemination of improved silkworm breeds, disease management practices, quality planting material and low-cost rearing devices are essential. In Assam, region specific technologies are required due to unique climatic conditions.

Use of biocontrol agents, botanical pesticides and microbial formulations can reduce dependence on chemicals. Digital tools for weather forecasting disease diagnosis and market information can further strengthen resilience and efficiency. Research institutions and extension agencies must work collaboratively to ensure technology adoption at the grassroots level.

Policy and institutional support

Government policies and institutional frameworks significantly influence the sustainability of sericulture. In Assam various schemes under the state and central government's aim to promote sericulture through subsidies training infrastructure development and research support. Aligning these initiatives with sustainability goals is necessary to ensure long term impact.

Policy focus should shift from production centric approaches to holistic development encompassing environment livelihoods and culture. Monitoring and evaluation mechanisms based on sustainability indicators can help assess progress and guide future interventions.

Conclusion

Sustainable development of sericulture in Assam

holds immense promise for achieving inclusive rural development environmental conservation and cultural preservation. The unique diversity of silk varieties practiced in the state provides a strong foundation for sustainability-oriented growth. By integrating environmentally sound practices economically viable value chains and socially inclusive approaches sericulture can become a resilient livelihood option in the face of climate and market uncertainties.

However, realizing this potential requires coordinated efforts among farmers researchers, policymakers and market actors. Emphasis on organic and climate resilient practices capacity

building of rural communities especially women technological innovation and supportive policies is essential. Sustainable sericulture should not be viewed merely as an economic activity but as a holistic development pathway that aligns with the broader goals of sustainable development in Assam.

References

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