Study On Improving Awareness of Farmers in Eri Silkworm Rearing in Saran District of Bihar

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***Abstract*— Eri-silkworm (*Samia ricini*), a non-mulberry silkworm species, is traditionally reared on castor (*Ricinus communis*) leaves, which provide optimal nutritional support for larval growth and cocoon development. However, the seasonal and regional unavailability of castor in many parts of Bihar, including Saran district, has prompted the need to explore alternative food plants. The present study investigates and compares the rearing performance of eri-silkworm on three host plants—*Ricinus communis*, *Manihot esculenta* (tapioca), and *Heteropanax fragrans*—under field conditions in the Saran district of Bihar. The larvae were observed for parameters such as larval duration, survival rate, cocoon weight, and silk yield. The results revealed that castor-fed larvae showed the highest growth rate, cocoon quality, and survival, while tapioca-fed larvae demonstrated comparable traits and adaptability. *Heteropanax fragrans* performed relatively lower in terms of larval development and cocoon characteristics. These findings support earlier research by Suryanarayana & Srivastava (2005) and *Das et al*. (2020), which emphasize the potential of tapioca and other locally available food plants as suitable alternatives for eri-silkworm cultivation. This study encourages the use of region specific host plants to promote year-round rearing and enhance sericulture-based livelihoods in Bihar.**

***Index Terms*—Silkworm, Samia ricini, alternative host plants, *Ricinus communis*, *Manihot esculenta*, *Heteropanax fragrans*, cocoon yield, Bihar, Saran district, sericulture sustainability.**

I. INTRODUCTION

Sericulture is one of the oldest rural-based agro-industries in the world, providing sustainable employment and income generation opportunities, especially for small and marginal farmers. Among the various types of silk, *eri* silk (produced from *Samia ricini*) is known for its eco-friendly, non-violent nature of production and wide range of uses.

Globally, *eri* silk is gaining popularity for being hypoallergenic, warm, and a suitable alternative to synthetic textiles. Countries like China, Japan, Thailand, and Brazil are investing in sustainable silk industries where *eri* and other non-mulberry silks are becoming increasingly important (Singh & Ahmed, 2020). The rising demand for ethical and organic fibers in the global fashion market has positioned eri silk as a valuable commodity in the green textile movement (*Sarmah* et al., 2021).

India ranks second globally in silk production and is unique in being the only country producing all four major types of silk—mulberry, eri, tasar, and muga. *Eri* silk contributes approximately 8.6% of the total raw silk production in India, most of which comes from the northeastern states like Assam, Meghalaya, and Manipur (Central Silk Board, 2023). These regions have strong cultural and traditional ties with *eri* silk, where rearing is often integrated into daily rural life and women-led enterprises. In Assam alone, over 2.5 lakh households are engaged in *eri* culture. The success in these regions is largely due to a combination of traditional knowledge, scientific interventions, and proactive government schemes.

However, the potential of *eri* silkworm rearing is not limited to the northeast. States like Bihar, with a predominantly agrarian economy, suitable climatic conditions, and growing interest in livelihood diversification, offer an untapped opportunity for *eri* silk expansion (Kumar & Prasad, 2023). Bihar, despite being a low silk-producing state, possesses favourable environmental conditions for the cultivation of host plants such as *Ricinus communis* (castor) and *Manihot esculenta* (tapioca), both essential for *eri* silkworm rearing (Das et al., 2022). *Eri* silk cultivation, if introduced with proper planning, can become an important alternative source of income, particularly for women and landless laborers.

Saran district, located in the north-western part of Bihar, is one such region with immense potential. It

has fertile alluvial soil, moderate climate, and a rural population engaged mostly in agriculture. According to the District Census Handbook (2022), over 80% of Saran's working population is involved in agriculture and allied activities. However, due to limited awareness, lack of training, and poor access to host plants and markets, *eri* rearing remains almost absent in the district. Initial field surveys conducted in villages like *Bintoliya*, *Turkwaliya*, and *Bikrampur* revealed that although farmers are interested in learning new income-generating techniques, they lack knowledge about non-mulberry sericulture.

Furthermore, existing agricultural extension systems in Bihar have focused mostly on crops like wheat, paddy, and vegetables. Sericulture-related awareness and training programs are either missing or very limited. Krishi Vigyan Kendras (KVKs) and agriculture departments have the infrastructure but lack dedicated modules for *eri* training. In comparison, northeastern states have adopted cluster-based training models, use of demonstration plots, and distribution of starter kits to popularize *eri* rearing among rural households (Pathak & Saikia, 2022).

A critical barrier in Saran is the lack of initial exposure — most farmers interviewed had never seen an *eri* silkworm or cocoon, nor did they know about its market value or government schemes linked to sericulture. Despite this, a strong interest was recorded during focus group discussions when farmers were informed about the low investment, home-based nature of *eri* rearing, and its compatibility with women's work schedules. This aligns with studies by *Narzary et al*. (2024) which show that rural adoption of *eri* culture is which show that rural adoption of *eri* culture is highly dependent on awareness level and demonstration-based training.

This research thus aims to assess the current level of awareness, challenges faced by farmers, and the scope of introducing *eri* silkworm rearing as an alternative livelihood in the rural economy of Saran district. It also proposes a sustainable extension approach involving low-cost awareness drives, local resource mobilization (such as castor plant promotion), and the formation of self-help groups (SHGs) for collective rearing and marketing. By bridging the gap between interest and information, Saran and similar districts of Bihar can be transformed into new hubs of non-mulberry silk production, adding value to the rural economy and empowering farming communities.

II. MATERIAL AND METHODS

This study was conducted during 2023–2024 to assess the level of awareness and practices related to *eri* silkworm rearing among farmers in Saran district, Bihar. A combination of simple, low-cost, and participatory research methods was used to collect meaningful information from rural communities. Five villages—*Bintoliya* and *Turkwaliya* of Sadar Block, *Bikrampur* of Marhoura Block, *Kauru-Dhauru* of Manjhi Block and *Kadipur* village of Nagra Block,—were randomly selected based on agro-climatic suitability, availability of host plants like castor (*Ricinus communis*), and farmers' willingness to adopt new practices (*Kumar & Prasad, 2023*). Data were collected using structured interviews with 100 farmers through pre-designed questionnaires, focus group discussions (FGDs) with 8–10 farmers in each village to understand their views and shared challenges, and field observations to verify local practices and the presence of *eri* rearing units. These participatory and low-cost tools are effective for rural field studies (*Narzary et al., 2024*; *Das et al., 2022*). To improve farmer knowledge, awareness programs were organized in two villages using printed leaflets and live demonstrations about *eri* silkworm management, host plant care (castor and tapioca), and cocoon harvesting techniques. These sessions were supported by local NGOs and trained volunteers, following models used successfully in Northeast India (*Sarmah et al., 2021*).

Collected data were analyzed using basic percentage and cross-tabulation methods without the use of expensive software, allowing the results to be easily understood and shared with local stakeholders.

Fig. 1: Location of Saran District in Bihar.

III. RESULTS AND DISCUSSION

The findings of the study reveal a significant gap in awareness and adoption of *eri* silkworm rearing practices among farmers in Saran district. Out of the 120 farmers interviewed, only 15% had heard about *eri* silkworm rearing, and about 7.5% had seen or attempted rearing it in any form. Most respondents were familiar with general sericulture due to awareness about silk, but very few were aware of the specific benefits of *eri* silk, including its low-cost input, ethical production, and year-round employment opportunities. The majority 27.5% of farmers expressed interest in learning more about *eri* rearing if proper training, plant material, and government support were provided. Farmers reported limited access to quality host plants like castor and tapioca, which are essential for feeding *eri* silkworms. In addition, 40.00% of respondents stated they had never received any formal training and about 10% are unfamiliar about sericulture. The study also observed that women showed greater interest in home-based *eri* rearing, especially when introduced to its potential through group discussions and live demonstrations. This aligns with findings from northeast India, where women-led *eri* units are common and successful due to the ease of rearing and flexibility of operations (*Sarmah et al., 2021*). Awareness camps and demonstration units organized during the study showed positive outcomes — over 50% of participants showed willingness to begin trial rearing of silkworms if support in terms of seeds, plants, and basic equipment is made available. Field observations confirmed that the agro-climatic conditions of Saran are suitable for castor cultivation, which has already been adopted on a small scale by some progressive farmers. Discussions with local Krishi Vigyan Kendras (KVKs) and agriculture officers revealed a lack of targeted extension programs for *eri* silk, although they expressed readiness to collaborate if demand from farmers increases. These findings indicate that with the introduction of simple training modules, access to castor saplings, and smallscale subsidies or start-up kits, *eri* silkworm rearing can be effectively promoted in Bihar. Previous research also supports this, suggesting that even marginal farmers can benefit from non-mulberry sericulture in regions like Bihar and Jharkhand when properly guided (*Das et al., 2022*; *Kumar & Prasad, 2023*). A similar study by *Narzary et al. (2024)* in Assam found that farmers responded positively to structured awareness campaigns, leading to an increase in *eri* cocoon production over a short period. Therefore, this study suggests that farmer awareness is the key entry point for the successful adoption of *eri* rearing, especially in underutilized regions like Saran district. Long-term development would depend on a convergence of efforts between research institutions, local NGOs, and rural development programs to build a sustainable *eri* sericulture model for Bihar.

Table 1;-Data shows after interview of 120 farmers in Study area of Saran District of Bihar

Sl.	Particulars	No farmers	Percentage
1	Heard about Eri silkworm	18	15.0%
2	Have seen/ eri silkworm rearing through different sources	09	7.5%
3	Interested if trained	33	27.5%
4	Never Received Training	48	40.0%
5	Unfamiliar about sericulture	12	10.0%

Fig. 2: No. of Farmer Awareness and Involvement in *Eri* Silkwork Rearin (Saran District)

IV. CONCLUSION

The present study highlights a critical gap in farmer awareness, training, and adoption of *eri* silkworm rearing practices in Saran district of Bihar. Despite favorable agroclimatic conditions and the potential of *eri* culture as a low-cost, sustainable income source, most farmers in the region remain unaware or inadequately informed about its benefits. The lack of access to quality host plants such as castor (*Ricinus communis*), insufficient government outreach, and absence of localized training programs are major constraints. However, the findings also

show a strong willingness among farmers—particularly women—to adopt *eri* rearing if proper support and knowledge are provided. Awareness programs, live demonstrations, and community-based training models have already proven successful in northeastern states like Assam and Manipur (*Narzary et al., 2024; Das et al., 2022*). If such initiatives are adapted to Bihar's local conditions, and supported by institutions like Krishi Vigyan Kendras (KVKs), local NGOs, and government schemes, it is possible to develop a viable *eri* sericulture model. Strengthening the supply of host plants, ensuring access to basic rearing kits, and integrating sericulture with rural livelihood missions (like NRLM) can make *eri* silk a strong economic alternative for Bihar's small and marginal farmers (*Sarmah et al., 2021; Kumar & Prasad, 2023*). In conclusion, bridging the awareness gap through participatory and low-cost extension methods is the key to transforming Saran and similar districts into emerging hubs for sustainable *eri* silk production.

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