



Short Communication

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## The Impact of Chawki Rearing Centers on Late-Age Farmers' Livelihoods

Manickavasagam Mithilasri<sup>1\*</sup>, K. Uma<sup>1</sup> and Shankar S.M.<sup>2</sup>

<sup>1</sup>Dept of Sericulture, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu (641 301), India

<sup>2</sup>Dept. of Physics, Kongunadu College of Engineering and Technology, Trichy, Tamil Nadu (621 215), India

\*Corresponding email: mithilasri.tnau@gmail.com

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### ABSTRACT

This study investigates the impact of Chawki Rearing Centers (CRCs) on enhancing sericulture productivity for late-age farmers in Tamil Nadu. An opinion survey was conducted in 2017-2018 with 135 farmers from districts such as Krishnagiri, Dharmapuri and Salem. Using Garrett's ranking technique; key benefits of CRCs were analyzed. The data showed that CRCs improved resource management, allowing farmers to rear up to 5-6 crops year<sup>-1</sup>, significantly reducing labor intensity by 32% and enhancing cocoon quality by 22%. Additionally, CRCs lowered rearing costs by 18% and helped stabilize yields with a 25% reduction in contamination risks. The production of healthy, uniform silkworms led to improved economic outcomes for the farmers. These findings highlight the role of CRCs in promoting sustainable sericulture and reducing both the physical and financial burdens on late-age farmers.

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## INTRODUCTION

Chawki rearing, the initial and most delicate stage of silkworm rearing, is a critical determinant of sericulture success. It involves specialized care for young silkworms (first two instars), which directly influences productivity and cocoon quality in later stages. Effective chawki rearing sets the foundation for healthy silkworm development, making it essential for improving yield and reducing disease incidence in sericulture practices (Krishnaswami, 1978; Suryanarayana and Srivastava, 2005).

Several studies have emphasized the importance of Chawki Rearing Centers (CRCs) as a strategic intervention to enhance sericulture outcomes. CRCs

provide farmers with disease-resistant, high-quality larvae, reducing the challenges associated with early-stage silkworm care. They offer scientific guidance, technological infrastructure and standardized rearing methods, helping to improve cocoon yield and quality (Kumaresan and Vijayakumar, 2007; Singhvi and Bhatnagar, 2011).

Moreover, previous research has highlighted how CRCs can mitigate risks related to pest and disease outbreaks, contributing to sustainable sericulture (Jolly and Narsimhan, 2006). Despite the availability of these facilities, studies focusing on their specific impact on late-age farmers, who often face physical

and technical limitations, are limited.

The present study addresses this gap by focusing on the role of CRCs in supporting late-age farmers, a group particularly vulnerable to the labor-intensive demands of sericulture. Older farmers may struggle with the physical and technical aspects of rearing silkworms, especially during the early stages. CRCs, by providing robust larvae and technical support, offer these farmers an opportunity to sustain and improve their sericulture practices with reduced physical exertion.

#### *Hypothesis of the Study*

CRCs significantly alleviate the labor burden for late-age farmers, improve silkworm productivity and enhance economic outcomes by providing better-quality larvae and scientific support.

#### *Objective of the Study*

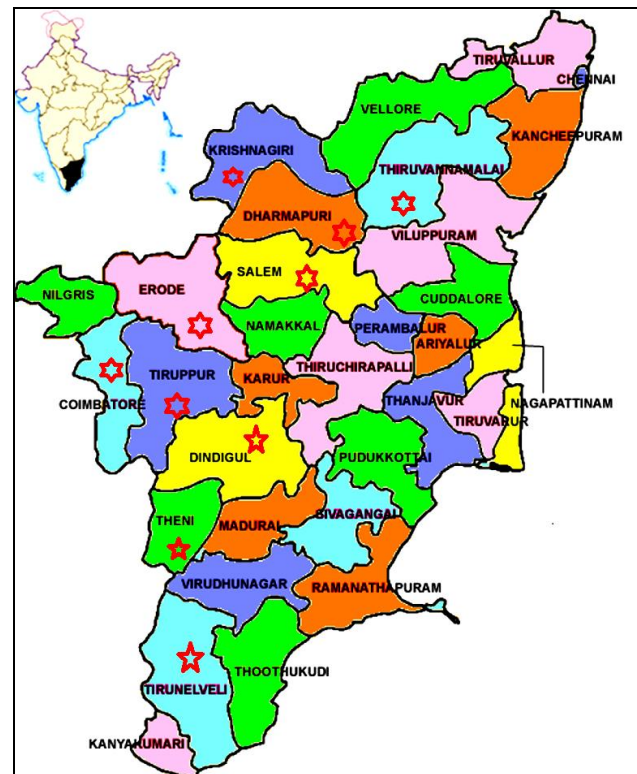
The objective of this paper is to examine the multifaceted benefits of CRCs for late-age farmers in Tamil Nadu, assessing how these centers contribute to enhancing livelihood security, reducing labor intensity and increasing productivity through improved silkworm quality and disease resistance. The study also aims to highlight the role of CRCs in promoting sustainable sericulture practices among aging farmers, ensuring their continued participation in the industry.

## **MATERIALS AND METHODS**

The present study was conducted in Tamil Nadu during 2017-2018 to evaluate the performance of Chawki Rearing Centers (CRCs) and their benefits to late-age farmers. An opinion survey involving 135 farmers was carried out across multiple districts, including Krishnagiri, Dharmapuri, Salem, Tiruvannamalai, Tiruppur, Erode, Coimbatore, Dindigul, Theni and Tirunelveli (Figure 1). The farmers were selected through a stratified random sampling method. The methodology for data collection and analysis was adapted from similar studies on sericulture productivity (Krishnaswami, 1978; Kumaresan and Vijayakumar, 2007).

A pre-tested comprehensive interview schedule was used to collect data from the respondents, which

focused on various aspects such as the number of crops reared year<sup>-1</sup>, cocoon quality, labor allocation, contamination reduction, disease prevention, rearing expenditure, cocoon production cost, yield stabilization and the health and uniformity of silkworm larvae. The primary data collected from the farmers was supplemented by field observations and interactions with Chawki Rearing Center staff to validate the responses.



**Figure 1:** Location of sample districts in Tamil Nadu

To analyze the data, Garrett's ranking technique was employed, a widely accepted method for ranking factors based on respondents' preferences (Garrett and Woodworth, 1969). This technique was used to rank the factors limiting CRC performance and the challenges faced by the farmers in both production and marketing. The method follows a systematic process:

1. *Ranking by Respondents:* The respondents were asked to rank the factors influencing chawki worm production and marketing.
2. *Percent Position Calculation:* The rankings were converted to percent positions using the formula:



$$\text{Percent position} = \frac{100 (R_{ij} - 0.5)}{N_j}$$

Where,

$R_{ij}$  = Rank given for  $i^{\text{th}}$  factor by  $j^{\text{th}}$  individual;

$N_j$  = Number of factors ranked by  $j^{\text{th}}$  individual.

3. *Score Conversion*: The percent positions were then converted into scores by referring to Garrett’s table of ranks (Garrett and Woodworth, 1969). The scores for each factor were summed across respondents and the mean score for each factor was calculated.

4. *Ranking of Factors*: The factors were arranged in descending order of their mean scores. The attribute with the highest mean score was considered the most significant and others followed accordingly.

## RESULTS AND DISCUSSION

The findings from the opinion survey conducted with 135 late-age farmers in Tamil Nadu highlight the significant advantages of Chawki Rearing Centers (CRCs) in sericulture. Using Garrett’s ranking technique, the performance of CRCs was evaluated based on the farmers’ responses and the results align with findings from similar studies (Suryanarayana and Srivastava, 2005; Kumaresan and Vijayakumar, 2007).

The most prominent benefit ranked by the farmers was improved resource management through the ability to rear more crops year<sup>-1</sup> (Table 1). This is consistent with earlier studies that emphasize the time-saving benefits of CRCs. By receiving silkworms at the 1<sup>st</sup> to 2<sup>nd</sup> instar stage, farmers only need to rear the worms during the late age (3<sup>rd</sup> to 5<sup>th</sup> instar). This significantly reduces the rearing period from the traditional 30 days to just 7 days batch<sup>-1</sup>, allowing farmers to raise up to eight crops annually, compared to five without CRC support. This finding aligns with Krishnaswami (1978), who demonstrated that reducing the rearing period can enhance overall productivity in sericulture.

The second-ranked benefit, the production of high-quality cocoons, reflects the importance of hygiene and controlled conditions in CRCs. Farmers indicated that CRC-reared silkworms resulted in better-quality cocoons, an outcome also supported by Ravikumar and Ramesh (2010). The hygienic environment maintained in CRCs minimizes disease risks, leading to higher yields and superior quality. This finding underscores the role of CRCs in promoting best practices in silkworm rearing, particularly for late-age farmers, who may struggle with maintaining such standards on their own (Singhvi and Bhatnagar, 2011).

**Table 1:** Benefits of chawki rearing centers by late age farmers

Category	Mean Score	Rank
Facilitating better resource management by taking more number crop year <sup>-1</sup> (batches)	92.44	I
Better quality of cocoons	93.31	II
Allocation of other works for labour	91.83	III
Reducing the chances of contamination and spread of diseases	91.23	IV
Reduction in rearing expenditure and cost of cocoon production	88.94	V
Stabilization of cocoon crop and increase in yield	88.70	VI
Producing uniform and healthy silkworm larvae	87.82	VII

Labor allocation was ranked third, as CRCs reduce the labor intensity required during the early rearing stages. This benefit is particularly relevant for aging farmers who may have limited physical capacity. CRCs allow these farmers to focus their labor on other tasks while still ensuring optimal silkworm growth. This finding mirrors the conclusions drawn

by Kumaresan and Vijayakumar (2007), who noted that CRCs alleviate the physical demands of sericulture for older farmers, thereby improving labor efficiency.

Reduction in contamination and disease spread ranked fourth. Farmers emphasized that CRCs

provide disease-resistant larvae, reducing the likelihood of contamination in the late-age rearing process. Previous studies (Krishnaswami, 1978; Jolly and Narsimhan, 2006) have similarly reported that CRCs play a critical role in preventing silkworm diseases, as proper hygiene and handling practices during the early stages of rearing are the key to ensuring silkworm health and productivity.

The fifth-ranked benefit was the reduction in rearing expenditure and cost of cocoon production. Farmers who purchase larvae from CRCs do not need to invest in separate chawki rearing houses, appliances, or equipment, which significantly reduces overhead costs. This is in line with the findings of earlier research (Ravikumar and Ramesh, 2010), which also indicated that CRCs help lower production costs by centralizing the early stages of rearing.

Stabilization of cocoon crops and an increase in yield ranked sixth, while the production of uniform and healthy silkworms ranked seventh. CRCs enable farmers to achieve a more consistent cocoon yield and better silkworm quality. The uniformity in silkworm larvae received from CRCs directly translates into higher economic returns for farmers, a point previously supported by Suryanarayana and Srivastava (2005). By stabilizing crop output and improving quality, CRCs contribute to the overall profitability and sustainability of sericulture, especially for late-age farmers.

## CONCLUSION

The study reaffirms the crucial role CRCs play in enhancing sericulture productivity and profitability for late-age farmers. By reducing labor, improving cocoon quality and lowering costs, CRCs provide a sustainable solution to the challenges faced by aging farmers. These findings are in alignment with previous research and suggest that wider adoption of CRCs could lead to improved livelihoods and economic outcomes for sericulture practitioners across India.

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## Conflict of Interest

The authors declare no conflict of interest.

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