

CHAWKI REARING CENTRES

Technical Publication Series

The JSS Krishi Vigyan Kendra, started in 1994, is a transfer of technology project supported by the ICAR, New Delhi, and managed by JSS Mahavidyapeetha, Mysore. The KVK is envisaged to be a 'technology provider' at the district level. While implementing its mandated activities to identify and popularize location-specific technologies, the KVK is generating valuable knowledge and experiences by working with farmers and extension workers. The Technical Publication Series is a means of sharing knowledge, innovations, triumphs and lessons so generated, for the benefit of farmers, farm women, rural youth, community-based organizations, extension workers and R&D agencies.

The CRCs

Chawki Rearing Centers are meant to grow quality silkworms under disease free environment, reduce worm rearing duration, cost and to improve cocoon productivity. JSS KVK has promoted three CRCs managed by farmers' self-help groups since 2008. At two batches every month, the three CRCs are brushing 24,000 DFLs/month, generating employment of 3600 person-days and an income of Rs. 1500/month for each SHG member. The total value of annual wages and incentives is Rs. 1.80 lakh. From 25 batches in a year, the three CRCs are brushing 300,000 DFLs. With the use of chawki worms by farmers, the cocoon yield has risen from the district average of 59 kg to 71 kg/100 DFL. The monetary value of the annual 20% incremental cocoon yield of 42,600 kg is Rs. 85.20 lakh. Thus, the income through employment generation and the incremental cocoon yields, together, are contributing to wealth generation worth Rs. 87 lakh/annum.





Silk industry – An overview

Silk is called “Queen of Textiles” although it accounts for only 0.2 per cent of world's total textile production. Silk was introduced in India from China about two centuries ago. It is believed silk was smuggled into India through Tibet through the notorious “Silk Route”

Asia produces over 95 per cent of the global silk. While India is the second largest producer (18,475 MT, 2006-07), it is the largest consumer of silk in the world. The silk industry has a potential of generating rural employment for over 74 lakh people and an export earnings of Rs.4,325 crore.

Sericulture enterprise

Silk is a high value, low volume product. Sericulture is one of the earliest enterprises in which precision farming techniques like spacing and exact plant population, application of accurate quantity of nutrient and strict irrigation schedule were adopted. In sericulture, unlike cultivation of many crops, the farmers deal with two biological processes viz., mulberry cultivation and silkworm rearing.

Mysore silk

Sericulture is part of the cultural heritage of Mysore district. Mysore silk is popular world over and has a history of over 220 years. History reveals that the famous Muslim ruler Tippu Sultan, the Emperor of Mysore, introduced Sericulture in Karnataka in 1780 AD. Although sericulture was being practiced sporadically in northern India, Tippu Sultan brought it to south India as a means of raising funds to build his armament. Eventually, sericulture became one of the major enterprises in southern India while it remained low-key in the north.

Mysore is recognized in the world through Geographical Indication Tag (GIT) for silk. The Mysore silk stands out among all other silk fabrics for its unique sheen and regal look, amazing drape, pure yarn and zari.

Mulberry, the host plant for silkworms, is being cultivated on an area of 2,670 ha in Mysore district spread across 682 villages. The average cocoon yield in the district is 59 kg per 100 Disease Free Layings (DFLs), generating annual revenue of Rs.33.37 crores.

Chawki rearing

Chawki rearing refers to rearing of young silkworms, from egg hatching up to the second moult stage, under controlled micro climate. The process of chawki rearing may be compared to nursery raising in horticulture and plantation crops. The purpose of chawki rearing is to grow quality silkworms under disease free environment, to reduce worm rearing duration, cost and to improve cocoon productivity at farmers' level.



The farmers generally buy silkworm eggs (DFLs) from grainages, either government or private, hatch and rear in their dwelling houses or in the silkworm rearing houses constructed separately. Quite often, the worms are affected by pests and diseases at the very young, vulnerable stage due to poor hygienic condition, especially when the rearing house is part of the farmers' dwelling house. This apart, many farmers have difficulty providing suitable microclimate for hatching of eggs thus compromising on the quantity and quality of worms and, at times, resulting in staggered hatching and loss of worms during brushing (separating worms from eggs). This leads to poor cocoon yield. Also, the process from eggs to cocoon harvesting takes about 30 days involving cost of pest and disease management as well as feeding the worms with mulberry leaves.

Alternatively, the farmers could purchase worms of about 8 days (2ndmolt) from Chawki Rearing Centers and rear them for the next 20 days. This helps farmers by making available healthy, uniform worms, saves rearing time by 10 days and hence saves cost of pest and disease management, and improves cocoon yield by about 20 to 25 per cent.

Conventional versus chawki rearing – A comparison

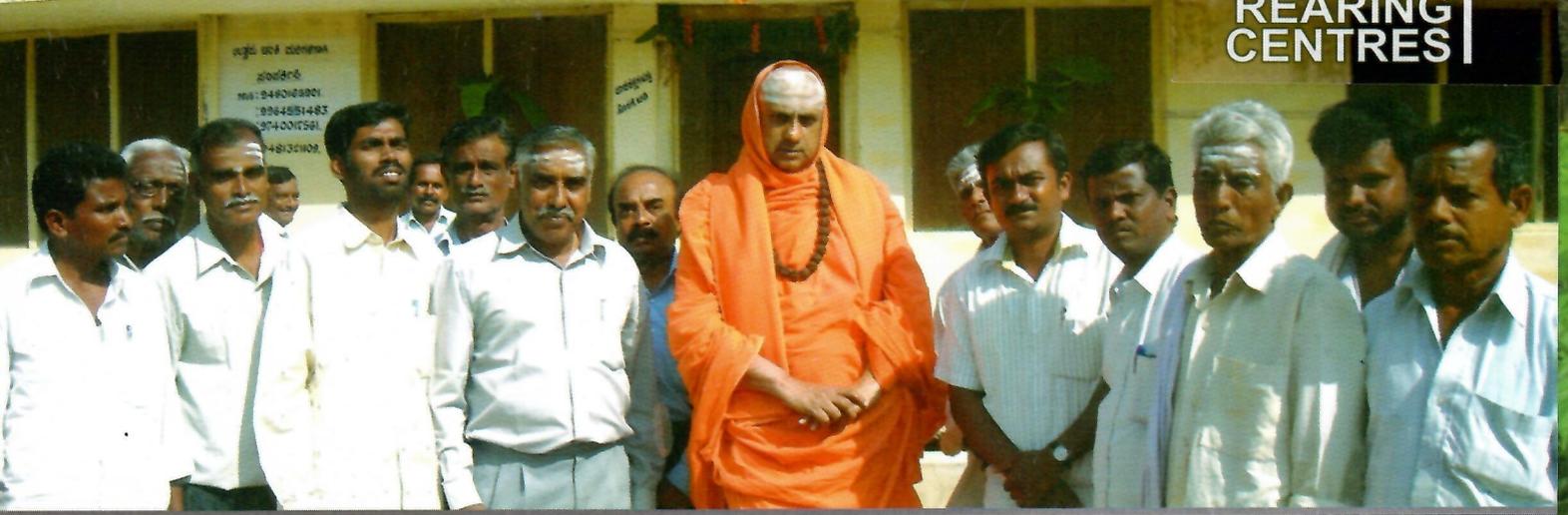
Traditionally, as many as 75 per cent farmers procure eggs from grainages and rear in their dwelling houses whereas in chawki rearing, the eggs from grainages are reared at the chawki rearing centers (CRC) for the first eight days under hygienic, controlled temperature and relative humidity (RH). While in CRCs the 'Black-boxing technique' provides uniform hatching and better worm recovery due to proper care, the conventional method does not normally involve black-boxing at egg stage and worm handling is poor at the moult stage. The average cocoon yield in conventional method is 50 to 55 kg cocoon/100 DFL whereas the CRCs offer a productivity of 60 to 65 kg/ 100 DFL.

Promotion of CRCs by JSS KVK

Despite the fact that chawki worms carry the advantages of saving time, cost and increasing cocoon yield, there were hardly any CRCs operating in Mysore district until 2006. Some of the sericulture farmers who were aware of the utility of chawki worms were either resorting to careful handling of eggs or were buying chawki worms from the neighboring Mandya district. Yet, over 75 per cent of silkworm rearing farmers in the district were unable to get quality chawki worms.

While CRCs are common in sericulturally advanced countries like China, Japan and Korea, the concept is yet to gain ground in India despite special efforts by ICAR under the Institution Village Linkage Programme (IVLP). Identifying the importance of CRCs for providing impetus to sericulture enterprise, JSS KVK initiated efforts of establishing CRCs in Mysore district in the year 2006 under the special SGSY scheme of the Government of India.

JSS KVK intensified its efforts of promoting CRCs through farmers' self-help groups (SHGs) in needy areas with the funding support from the Department of Bio-Technology (DBT), New Delhi in 2008.



The project is being implemented since 2008 in two districts, Mysore and Chamarajanagar. So far, three CRCs have been initiated by the KVK, one each in Belagunda and Indavalu of Mysore district and one in Kuderu village of Chamarajanagar district. Two of the three CRS are being run by farmers' Self-Help Groups (SHGs) whereas the one in Belagunda is being managed by the KVK. Two SHGs, consisting of 10 members each, are promoted in Indavalu and Kuderu villages. The 20 members were shown the operation of CRC at Belagunda and were given hands-on training at the KVK. The members were also trained on the skills of group management and marketing of chawki worms. The SHGs in Kuderu and Indavalu immediately established their won CRCs and started brushing 500 and 100 DFLs, to begin with. The three CRCs have now completed one year of successful operation and have reached a brushing capacity of 2500 (Kuderu), 7500 (Indavalu) and 2000 DFLs (Belagunda) per batch. At two batches every month, the three CRCs are brushing a total of 24,000 DFLs per month. Farmers from neighbouring villages are procuring chawki worms from the CRCs and the CRCs are also delivering the chawki worms at the doorsteps of farmers, on demand.

Benefits to chawki-rearers

The average manpower required for looking after a chawki center is five members for brushings about 4000 DFL/ batch, which is the present average of the three CRCs. Each batch requires 7 days of worm rearing and 2 to 3 days for cleaning the rearing room, thus lasting 10 days. This means an employment of 300 person-days per month/CRC (5 men/batch/ CRC*10 days*2 batches*3 CRCs). The three CRCs put together are hence generating 3600 person-days of employment (@ 300 person-days *12months). With this kind of engagement in CRCs, each SHG member is earning between Rs. 1000 to Rs. 1500 per month, in the form of wages and incentive from the 30 per cent profit earned by the CRCs. The remaining 70 per cent of the revenue is used to meet the working capital requirement. The total value of wages and incentives works out to a total of Rs. 1,26,000 to 1,80,000. It may be noted here that this is an additional income for those involved in chawki rearing since it is only a part-time work for the members that involves about 4 hours of work every day.

Innovations by JSS KVK in promoting CRCs

- Process innovation
 - * JSS has introduced and popularized CRCs in place of conventional silkworm rearing
 - JSS KVK has ventured introduction of CRC
 - * in dry land sericulture area (Kuderu)
 - JSS KVK has facilitated staggered brushing of eggs by networking the three CRCs in
 - * order to ensure continuous supply of chawki worms
- Institutional innovation
 - * Except for one CRC managed by the KVK the remaining three CRCs are by men self-help groups (SHGs)
- Technical innovation
 - * New technologies are being adopted by farmers such as hanging water pots in the rearing rooms for temperature and humidity management. The farmers are also using leaf chopping equipments developed by farmers after learning about such equipments during study tours.



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Benefits to sericulture farmers using chawki worms

At 24,000 DFLs from the two batches possible in a month, and about 25 batches annually, the three CRCs are brushing 300,000 DFLs per year. At the rate of 300DFLs per acre of mulberry garden, a total area of about 1000 acre (400ha) mulberry garden in the district is undergoing silkworm rearing by using chawki worms produced by the three CRCs. About 75 per cent of farmers are rearing cross breeds while the remaining 25 per cent are rearing the CSR hybrids. Going by the actual experience of yield improvement attained by farmers buying chawki worms from the three CRCs, the cocoon yield has risen from the district average of 59kg/100DFL to 71kg/100 DFL (20% more). Therefore, the brushings from the three CRCs have contributed a total of 2,13,000 kg quality cocoons, which in conventional method, without the chawki, would have been only 1,70,400kg. The monetary value of the annual incremental cocoon yield of 42,600 kg is Rs. 85,20,000 at Rs.200 per kg cocoon.

Thus, it may be concluded that the direct, part-time involvement of farmer entrepreneurs in sericulture generates an income of Rs. 1,80,000, while the incremental contribution to silk industry through increased cocoon yield is worth Rs. 85,20,000, put together an additional wealth generation of value Rs. 87 lakh.

Impact of CRCs

As a result of promoting three CRCs by the JSS KVK the following impacts are seen.

- Three new CRCs are started, at Senapathihalli and Madapura, respectively, in Mysore district and at Santhamaralli in Chamrajnagar district.
- The JSS KVK efforts through the three CRCs apart, the favourable price for cocoons and aggressive promotion of sericulture enterprise by various research and development departments together have resulted in nearly 75% silkworm rearing now coming under CRCs in Mysore district.
- The cocoon yield has increased by 20-25 per cent
- Due to the popularisation of CRCs and attractive cocoon price, the traditional mulberry area is regaining past glory in and around Mysore district.

Next steps

- Encouraged by the demand for chawki worms at the CRCs, the JSS KVK is working towards adding transport facility at CRCs in order for the CRCs to deliver chawki worms at the doorsteps of the farmers.





- The JSS KVK has recognized the need for developing the existing 'chawki rearing centers' into 'chawki resource centers' by building additional activities like production and supply of inputs by the CRCs and enabling the CRC-members to offer not only chawki worms but also quality inputs and sericulture advisory services.
- Efforts will be made to expand the network with other CRCs in the region and link farmers to increase the turnover and hence contribute to overall improvement of sericulture enterprise in Mysore district.

Conclusion

The significant financial benefits derived from the CRCs apart, the members of CRCs are now highly respected farm-entrepreneurs in their respective villages, and are being consulted for advice on mulberry cultivation, pest and disease management in mulberry cultivation and silkworm rearing, as well as on matters like better marketing opportunities. The success of the three CRCs has already inspired three more SHGS to start three more CRCs and is likely to attract more farmers. What is heartening is that the traditional dry land sericulture areas like Kuderu in Chamarajanagar, where sericulture had almost disappeared due to poor monsoon and irrigation facilities, the sericulture enterprise is re-emerging.

The success of CRCs is owed to the firm conviction of the host institution JSS Mahavidyapeetha, which believed that this is possible, and hence supported the initiative taken up by both the JSS KVK and the special SGSY project earlier. The spirited work by KVK staff and the tremendous cooperation by the local progressive sericulture farmers have been instrumental in attaining this remarkable success. In addition, the extension support from the State Department of Sericulture, quality seeds supplied by the National Silkworm Seed Project (NSSP) and the research support by the Central Sericulture Research and Training Institute (CSRTI), Mysore, were important contributing factors to the success of CRCs.

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