ISSN: 2347-4688, Vol. 8, No.(1) 2020, pg. 58-68

Current Agriculture Research Journal

www.agriculturejournal.org

# Impact of Cluster Promotion Programme on Socio-Economic Aspects on Women Sericulture Farmers in Karnataka, India

**G.S.GEETHA*, JOYCE RANI DASARI and AMIT SAHA**

Central Sericultural Research and Training Institute, Mysuru, Karntaka, India.

**Abstract**

This study was based on the primary household data collected to determine the impact of Cluster Promotion Programme (CPP) introduced to augment the production of bivoltine silk in India by Central Silk Board in coordination with state sericulture departments. Many technological interventions were made at individual and at community levels to increase the knowledge and adoption of new sericulture technologies. Studies in ten clusters attempted to address the impact of scheme on knowledge and adoption of new technologies and also on socio economic status of women sericulture farmers in Karnataka. Paired t-test was used to find out the impact of CPP on the beneficiaries before and after adopting the technological intervention. The findings this study indicated that the implementation of CPP has led to increased mulberry leaf production, dfls consumption, cocoon yield, cocoon price and income. Similarly, they found to have greater access to extension personnel (50.64%), extension communication activities (53.95%) and training (40%). Access to community intervention increased from 20 to 33%, credit increased to tune of 48.53% and self help group by 78.57%. Thus, implementation of CPP had increased knowledge and adoption of new technologies as well as socio economic status of women farmers. It may also be stated that the scheme was brought in a paradigm shift in the silkworm rearing in rural Karnataka. The sustained Bivoltine Silk Production depends to a large extent on transfer of new technologies at individual and community levels in a project mode with extensive planning and execution with greater involvement of the farmers in general and women farmers in particular in all stages.

**Article History**

Received: 2 January 2020
Accepted: 17 April 2020

**Keywords**:

Adoption;
Cluster Promotion Programme;
Sericulture;
Silkworm Rearing Socio Economic Impact;
Knowledge;
Women Farmers.

**CONTACT** G.S.Geetha geethashivaram@yahoo.com Central Sericultural Research and Training Institute, Mysuru, Karntaka, India.


Doi: 10.12944/CARJ.8.1.10

**Introduction**

Sericulture provides an excellent opportunity for generation of rural employment, empowerment of women and income generation and become a part of region's development. India is the second largest producer of raw silk and the biggest consumer in the world. The major mulberry silk producing states are Karnataka, Andhra Pradesh, West Bengal, Tamil Nadu and Jammu & Kashmir, which together accounts for 92 % of country's total mulberry raw silk production (www.csb.gov.in). Sericulture being a farm-based enterprise is highly suited for both large and small land holdings. Sericulture can generate employment @ 11 man-days per kg of mulberry raw silk production throughout the year, besides provides ample work for women (61%) in the rural areas. During 2017-18 the export earnings from silk was recorded to the tune of Rs 1649.48 crores (www.csb.gov.in). For the year 2017-18, the industry has provided employment to 86.04 lakh persons (www.csb.gov.in).

The cluster promotion programme was initiated during 2008 to increase the bivoltine raw silk production, improve productivity and quality. In the phase, the southern clusters recorded 31.95% improvement in cocoon yield over the bench mark (48.74 kg/100 dfls). Similarly in the second phase, the raw silk production recorded a jump of 174.86% from 2013-14 to 2017-18. Also the yield for 100 dfls also increased from 68.45 to 72.15 (CSRTI, Annual reports). This impressive jump of 174.86% over previous year 2013-14, was due to the implementation of CPP programme.

Sericulture is a women friendly occupation because it happens at next door, provides flexi hours to manage both house hold and sericulture activities and does not need any formal skill training, suitable for all age groups. Sericulture activities bestow with women an employed status working for self or working for others. Sericulture does provide an opportunity to build social networking and a platform to share the experiences. Sericulture being taken up as a main occupation either as a family labour (unpaid labour) or paid labour does increase the total family resources steadily. Besides, augments women's self decision making ability and positive disposal to women's role in politics. Women access to resources is meager particularly land & locally operating Self Help Groups are the only source of credit (Geetha and Indira[3])

Participation of women in sericulture activities has increased considerably from last decade particularly in silkworm rearing activities. The gender wise participation in overall sericulture activities was 38.66% in case of male and 61.19% in female. Gender wise time spent on different sericulture activities. A woman spends more time (4.18 hours/day) compared to her male counterpart (3.34 hours/day). The main activities carried out by women are harvesting of shoots, feeding of worms, cleaning of rearing house (Geetha *et al.,*[4]).

The present study was undertaken with the objectives like the impact cluster promotion programme on knowledge and adoption of new technologies and enhanced economic status, effectiveness technology support and common facilities on improvement in socio economic status of sericulture women.

**Materials and Methods**

To examine the impact of Cluster Promotion Programme on Socio-Economic and Communication aspects on women farmers of sericulture, a study was conducted during 2017-18 in the state of Karnataka, where CPP is in operation at present besides being endowed with large number of sericulture farmers. The impact evaluation study of CPP was undertaken from date of implementation of programme 2013 onwards. Multistage stratified random sampling adopted for selecting clusters. In the first stage, 10 clusters under operation were covered randomly, in the second stage, from each cluster 20 villages were identified based on the maximum sericulture households for the survey and in the final stage, 80 beneficiaries were selected from each village randomly based on the beneficiaries list from the respective DOS Office.

A total of 80 women beneficiaries under Cluster Promotion Programme were interviewed for primary data through pre tested interview schedule for pre and post intervention/technologies, accessibility and impact of interventions/technologies. Similarly, secondary data were collected from the websites www.csb.gov.in and from the Karnataka State Sericulture Departments. The raw data collected from primary and secondary sources was treated or

analyzed using simple averages, percentages and paired t test for before after comparison among the sample farmers.

**Results and Discussion**

**Knowledge and Adoption Level of Sericulture Technologies**

The knowledge and adoption of improved sericulture technologies is essential to realize the potential yield levels. To study the knowledge and adoption level of technology interventions at individual farmer level as well as community level at selected states, ten technologies/interventions at individual farmer level and four at community level were selected in this study.

**Technology Interventions at Individual Farmer's and Community Level**

The technology interventions taken up at individual farmers level include new mulberry plantation, Drip irrigation, Separate rearing house, Separate mounting hall, Trenching and mulching, Recommended dosage of disinfectants usage, Rearing appliances, Biofertilizer, Montages and Mechanization. The community intervention technologies include Kissan nursery, Chawki rearing centers, Biocontrol production units and Seri poly clinics. They were aimed at facilitating farmers with free supply of high yielding mulberry variety, scientifically reared chawki worms, biological control of diseases and sale of sericulture inputs at village levels, respectively.

Knowledge and adoption of technologies/ interventions at farmer's level and community level before and after Cluster Promotion Programme were worked out, scored and categorized as low, medium and high.

**Table 1: Knowledge of technologies/interventions of Karnataka farmers before CPP**

| S. No. | Technologies/interventions | Extent of knowledge (%) | | | Knowledge score | N=80 Knowledge index |
|---|---|---|---|---|---|---|
| | | Full | Partial | Nil | | |
| 1 | New mulberry plantation | 36.25(29) | 0 | 63.75(51) | 58 | Medium |
| 2 | Drip irrigation | 87.50(70) | 0 | 12.50(10) | 140 | High |
| 3 | Rearing house | 30(24) | 25(20) | 45(36) | 68 | Medium |
| 4 | Mounting hall | 46.25(37) | 18.75(15) | 35(28) | 89 | High |
| 5 | Trenching and mulching | 22.5(18) | 48.75(39) | 28.75(23) | 75 | Medium |
| 6 | Disinfectant usage | 22.5(18) | 68.75(55) | 8.75(17) | 81 | Medium |
| 7 | Rearing appliances | 61.25(49) | 27.50(22) | 11.25(9) | 120 | High |
| 8 | Biofertilizer | 21.25(17) | 43.75(35) | 35(28) | 69 | Medium |
| 9 | Mountages | 13.75(11) | 47.5(380 | 38.75(31) | 60 | Low |
| 10 | Mechanization | 56.25(45) | 11.25(9) | 32.50(26) | 99 | High |

Numbers are in parentheses

**Table 2: Categorization knowledge index of Karnataka farmers**

| Category | Knowledge index | Number | Percentage |
|---|---|---|---|
| Very Low | 30-40 | 2 | 20 |
| Low | 41-50 | 3 | 30 |
| Medium | 51-60 | 2 | 20 |
| Above Medium | 61-70 | 1 | 10 |
| High | 71-80 | 1 | 10 |
| Very High | >80 | 1 | 10 |

Data in the table 1 indicate that about 70 % of farmers in low, very low and medium knowledge category and did not have the knowledge of new mulberry variety, recommended dosage of disinfectants and montage. However, regarding adoption of technologies as evident from table 2 70% of the farmers were in very high, high and above medium and medium category. This indicates that the technology interventions under cluster promotion programme were successful and effective. High level of adoption of technologies was an indication that farmers were aware of benefits of cluster promotion programme and willing to adopt these technologies fully and effectively for increasing cocoon production.

**Table 3: Knowledge of technologies/interventions at community level of Karnataka farmers**

| S. No | Technologies/ interventions | Extent of knowledge (%) | | | Knowledge score | Knowledge index |
|---|---|---|---|---|---|---|
| | | Full | Partial | Nil | | |
| 1 | Kissan nursery | 62.50(50) | 15(12) | 22.5(18) | 112 | High |
| 2 | Seri poly clinic | 5(4) | 0 | 95(76) | 10 | Low |
| 3 | Bio production unit | 10(8) | 0 | 90(72) | 16 | Low |
| 4 | Chawki rearing centre | 80(64) | 20(16) | 0 | 128 | High |

Numbers are in parentheses

As shown in table 3 majority of the framers were having the knowledge of kissan nursery and chawki rearing centre and very low knowledge of seri poly clinic and bio production units. Majority of the farmers adopted chawki rearing centre followed by kissan nursery. None of the farmers adopted bio control production unit intervention and very few adopted seri poly clinic intervention.

**Table 4: Categorization knowledge index of community intervention of Karnataka farmers**

| Category | Knowledge index | Number | Percentage |
|---|---|---|---|
| Low | 5-10 | 2 | 50 |
| Medium | 11-50 | 0 | 0 |
| High | >50 | 2 | 50 |

From the study, it is also revealed that very less number of farmers (22.25%) were found to have full knowledge of the recommended dosage of disinfectants, 92.5% of the farmers fully adopted the recommended dosage of disinfectants. Similar observations were made by Hadimani 6. It indicates that the importance of use of recommended dosage of disinfectants was created through effective extension communication and training programmes, free supply of disinfectants by state sericulture departments and also changes in the attitude of farmers towards use of disinfectants.

Establishment of seri poly clinics, outlets for sale of sericulture inputs with less profit facilitated farmers to purchase disinfectants at low cost. The same kind of observations was also made by Dandin *et al.,*[2] and Choudhury.[1]

Regarding planting of new mulberry though the 36.25% of the farmers were having full knowledge of new mulberry variety, 88.75% of the farmers are adopting technology. Similar observations were made by Hadimani.[6] [6]This may be due to the awareness created through technology awareness programme, regular extension contact and good extension participation. The results are in line with the findings of Vijayaprakash and Dandin,[17] Meenal and Rajan[13] and Reddy *et al.,*[16] This was due to the technology intervention under Cluster Promotion

Programme, establishment of Kissan nurseries at Community level and free supply of new high yielding mulberry variety to the farmers. Hence, farmers preferred new high yielding variety V1 in the place of K2 or MR2.

**Table 5: Adoption of technologies/interventions at individual level after CPP**

| S. No. | Technologies/interventions | Extent of Adoption (%) | | | Adoption score | N=80 Adoption index |
|---|---|---|---|---|---|---|
| | | Full | Partial | Nil | | |
| 1 | New mulberry plantation | 88.75(71) | 0 | 11.25(9) | 142 | High |
| 2 | Drip Irrigation | 60(48) | 0 | 40(32) | 96 | High |
| 3 | Rearing house | 73.75(59) | 0 | 26.25(21) | 118 | High |
| 4 | Mounting hall | 7.50(6) | 0 | 92.50(74) | 12 | Low |
| 5 | Trenching and mulching | 45(36) | 0 | 55(44) | 72 | Medium |
| 6 | Disinfectant usage | 92.5(74) | 0 | 7.5(6) | 148 | High |
| 7 | Rearing appliances | 23.75(19) | 0 | 76.25(61) | 38 | Low |
| 8 | Biofertilizer | 30(24) | 0 | 70(56) | 48 | Medium |
| 9 | Mountages | 58.75(47) | 0 | 41.25(33) | 94 | High |
| 10 | Mechanization | 46.25(37) | 0 | 53.75(43) | 74 | Medium |

Numbers are in parentheses

**Table 6: Categorization adoption index at individual intervention level**

| Category | Knowledge index | Number | Percentage |
|---|---|---|---|
| Very low | 7.50-15 | 1 | 10 |
| Low | 16-30 | 2 | 20 |
| Medium | 31-45 | 1 | 10 |
| Above medium | 46-60 | 3 | 30 |
| High | 61-75 | 1 | 10 |
| Very high | >75 | 2 | 20 |

**Table 7: Adoptions of technologies/interventions at community level after CPP**

| S. No. | Technologies/interventions | Extent of Adoption (%) | | | Adoption score | N=80 Adoption index |
|---|---|---|---|---|---|---|
| | | Full | Partial | Nil | | |
| 1 | Kissan nursery | 43.75(35) | | 56.25(45) | 70 | High |
| 2 | Seri poly clinic | 2.50(2) | | 97.50(78) | 4 | Low |
| 3 | Bio production unit | - | | - | - | - |
| 4 | Chawki rearing centre | 87.5(70) | | 12.5(10) | 140 | High |

Numbers are in parentheses

**Table 8: Categorization adoption index at community intervention level**

| Category | Knowledge index | Number | Percentage |
|---|---|---|---|
| Low | 2.5-10 | 1 | 33.33 |
| Medium | 10-50 | 1 | 33.33 |
| High | >50 | 1 | 33.33 |

In this study, though 30% of the farmers were with full knowledge of separate rearing house for harvesting a successful crop. From the study, it is evident that 73.75% adopted the technology and only 26.25% of farmers without separate rearing house. This indicates that under CPP the awareness was created through Extension Communication and Training programmes on concept of separate raring house and its advantages over rearing cum dwelling house for successful bivoltine rearing. Subsidy for construction of rearing house and farmer's awareness of a separate rearing are the main reasons adoption of technology. However, the main reason for non adoption of technology was the financial constraint faced by the farmers to construct separate rearing house was found to be a major constraint. This is in line with the results of Hiriyanna[7] and Choudhury.[1]

Though the knowledge on montages – plastic and rotary was only 13.75%, adoption of the technology was 58.75% fully. One of the main possible reasons for increased adoption was creation of awareness on new montages through ECPs and Training programme besides subsidized supply of montages. The use of new montages also found to reduce the time, labour and drudgery.

The data revealed that 87.50 % of the farmers were having full knowledge of drip irrigation and 60% adopted the recommendation. However, though the 12.50% were not aware of technology and 40% were not adopted. The causes of less adoption were due to high cost and non availability of subsidy. Generally, farmers adopted low or no cost technologies fully and that are costly will be adopted partially or may not be adopted at all (Geetha, 1993). These are also in agreement with the observations made by Singhvi[15] and Dandin *et al.,*[2]

Regarding rearing appliances though the 61.25% were having full knowledge about the appliances, only 23.75% of the farmers were adopted the technology, 76.25% were not adopted at all. This was due cost of appliances. Besides, this the department provides the subsidy package choice for the farmers, which included disinfectants, montages and equipments. A farmer prefers for other packages rather than rearing appliances and settles to manages with available agriculture appliances.

In this study, though 56.25% of the farmers were with full knowledge of mechanization in sericulture, only 46.25% adopted the technology 11.25% of the farmers were having partial knowledge on mechanization, 53.75% of the farmers were not using machines. The less adoption of mechanization was due to lack of awareness and high cost. The studies of Lakshnanan *et al.,*[11, 14] Saratchandra and[10] Kanimozhi found that lack of awareness to a certain technology results in none adopting of technology.

Majority of the farmers were aware of mounting hall technology (46.25% fully) but only 7.50% fully adopted. Financial constraints faced by the farmers to construct mounting hall was found to be a major constraint. This is in agreement with the studies of Hiriyanna *et al.,*[7]

Knowledge of technology interventions like trenching and mulching and bio-fertilizer were poor among the farmers, which were found 22.5% fully and 21.25% fully, respectively. However, the adoption percentage was found to be considerably more compared to knowledge. The main reasons were due to free supply bio-fertilizer and implementation of trenching and mulching under rural employment scheme. Generally, farmers adopted low or no cost technologies fully and which were costly, adopted partially or were not adopted at all 5 Geetha. This is also in agreement with the observations made by Singhvi *et al.,*[15] and Dandin *et al.,*[2]

**Impact of Technologies**

**Paired T Test**

Paired t test was used to know the impact of certain technique on something. Suppose, a certain course started in school related to some subject. A sample of n students were given their test before attending that particular course and again after completing that course. Our aim was to check whether that course improves the marks or not which can be answered by paired t test. However, same samples should be used before and after the experiment. The details of paired test are given in below:

**Null Hypothesis**

$d_i = x_i - y_i$

**Alternative Hypothesis**

$d_i < 0$

**The Test Statistic of Paired T Test**

$$t = \frac{\bar{d}}{s_d/\sqrt{n}}$$

Test Statistics follow $^{t}$ distribution with $^{n-1}$ degrees of freedom.

Where, $^{n}$ is the number of observation

$$\bar{d} = \frac{1}{n}\sum_{i=1}^{n} d_i$$

$d_i = x_i - y_i$

$x_i$ = Value of $^{i}$ th observation before the intervention of technology

$y_i$ =Value of $^{i}$ th observation after the intervention of technology

After getting the computed value of test statistic, next step is to compare it with the table value, which will provide p value and decision will be made based upon the p -value.

The paired t test statistical tool was used to understand the before and after impact of the sericulture technology interventions under Cluster Promotion Programme by sericulture farmers. The results indicated at table 8.10.1 shows that P value was less than one and significant at 5% level. This implies that cluster promotion programme was facilitated in increasing production, which was shown by the significant difference. This signifies that with CPP intervention a farmer can expand production scale and produce more than they used to before.

**Table 9: Paired t test - before and after impact of CPP at individual farmer levelCategory**

| S. No. | Technologies | Mean of differences | t-value | Significances level | Degrees of freedom | P value |
|---|---|---|---|---|---|---|
| 1 | New mulberry plantation | -3.379 | -21.979 | 1% | 57 | <0.0001 |
| 2 | Drip irrigation | -1.380 | -22.854 | 1% | 46 | <0.0001 |
| 3 | Trenching and mulching | -0.658 | -15.451 | 1% | 35 | <0.0001 |
| 4 | Mounting hall | -13.33 | -12.649 | 1% | 5 | <0.0001 |
| 5 | Rearing house | -15.73 | -17.096 | 1% | 54 | <0.0001 |
| 6 | Mechanization | -12.77 | -15.012 | 1% | 30 | <0.0001 |
| 7 | Mountages | -12.6 | -8.32 | 1% | 9 | <0.0001 |
| 8 | Disinfectant usage | -17.41 | -15.122 | 1% | 57 | <0.0001 |
| 9 | Rearing appliances | -12.93 | -33.284 | 1% | 31 | <0.0001 |
| 10 | Biofertilizer | -2.64 | -12.878 | 1% | 20 | <0.0001 |

**Table 10: Paired t test before and after impact of CPP at community level**

| S. No. | Technologies | Mean of differences | t-value | Significances level | Degrees of freedom | P value |
|---|---|---|---|---|---|---|
| 1 | Kissan nursery | -1.06 | -13.701 | 1% | 47 | <0.001 |
| 2 | Seri poly clinic | -13.11 | -16.1 | 1% | 34 | <0.001 |
| 3 | Bio production unit | -28.31 | -31.31 | 1% | 31 | <0.001 |
| 4 | Chawki Rearing Centre | -8.85 | -21.805 | 1% | 45 | <0.001 |

It is evident from table 9 and 10 that there was a highly significant difference (P<0.01) in their adoption level, before and after the implementation of Cluster Promotion Programme. Results clearly indicated that CPP had a definite impact on the adoption level of the respondents. The reason for higher adoption of the CPP farmers might be due to the appropriateness of the technologies intervened at individual and community level. The CPP intervention environment in which farmers were exposed to the extension communication and training programmes structured with different extension communication methods and teaching aids like group discussion, field days, demonstration of technologies, farmer days, enlightenment programme, awareness programme, exposure visits, study tours, Reshme krishi melas , sericulture exhibitions etc. Another reason could be the higher interest and the exposure of farmers in the ECPs and training programmes as a result of which farmers got an opportunity to discuss their doubts with specialists and experienced farmers and got solutions and clarifications. Interaction with other farmers during ECP and training situation might have influenced the increased knowledge.

**Impact on the Economic and Social Condition**

The impact study was carried out on economic and social situation of the sericulture farmers before and after the introduction of CPP. Impact of technological intervention was on Mulberry leaf yield/ac/yr, Dfls consumption(ac/yr), Cocoon yield(kg/100dfls), Cocoon price(kg/Rs), Total cocoon production (kg), Cost of cocoon production (ac/year) and Total income.

**Table 11: Impact of Cluster Promotion Programme on economic aspects**

| S. No. | Particulars | Cluster Promotion Programme | | |
|---|---|---|---|---|
| | | Before | After | Improvement |
| 1 | Mulberry leaf yield/ac/yr | 13.05 | 16.43 | 25.90% |
| 2 | Dfls consumption(ac/yr) no. | 774.60 | 1050.00 | 35.55% |
| 3 | Cocoon yield(kg/100dfls) | 59.68 | 68.17 | 14.22% |
| 4 | Cocoon price(kg/Rs) | 261.82 | 404.23 | 54.39% |
| 5 | Total cocoon production (kg) | 462.28 | 715.78 | 54.83% |
| 6 | Cost of cocoon production (ac/year) Rs. | 224.97 | 252.95 | 12.43% |
| 7 | Total income | 121034 | 289339 | 139.05% |

It is revealed from table 11 that farmer could able to achieve 139.05% improvement in total income to the tune of Rs. 2,89,339 per annum after benefiting from CPP programme and shows a positive shift in the income level of the beneficiaries. After the intervention of Cluster Promotion Programme over all dfls consumption was increased by 35.55 %/ac/yr. The reason might be cited here that the increased mulberry lead yield (25.90%) due to adoption of new high yielding variety and its popularisation through kissan nursery under community intervention level, use of bio-fertilizer and trenching and mulching for improving the fertility of soil and appropriate water management through drip irrigation.

Farmers availing CPP technology intervention could able to harvest 14.22% more cocoon yield per 100 dfls. This might be because of the technology interventions those were introduced under CPP such as separate rearing house, usage of disinfectants and rearing appliances.

This signifies that with CPP intervention a farmer can expand production scale and produce more than they used to before they adopted the technologies intervened under CPP, therefore, increasing cocoon yield and income.

Introduction of mechanization under CPP intervention for both mulberry and silkworm rearing practices increased the quality and quantity of yield besides reducing the labour and drudgery of farmers. The technology interventions at community level supplied such as Kissan nursery, Seri poly clinic, Bio production unit and Chawki rearing centre increased supported the farmers with sericulture inputs at very less cost and facilitated to adopt and increase cocoon production.

**Table 12: Impact of Cluster Promotion Programme on social aspects**

| S. No. | Particulars | Cluster Promotion Programme | | |
|---|---|---|---|---|
| | | Before | After | Improvement |
| 1 | Access to credit | 49 | 72.78 | 48.53% |
| 2 | Access to extension personnel | 62 | 93.40 | 50.64% |
| 3 | Access to extension communication activity | 48 | 73.90 | 53.95% |
| 4 | Access to training | - | 40 | 40% |
| 5 | Access to community intervention | 20 | 33 | 65% |
| 6 | Access to local bodies - Self help group | 56 | 100 | 78.57% |

Table 12 shows significant differences in access to extension personnel (50.64%) and extension communication activity (53.95%) and training (40%) before and after introduction technologies under CPP programme. While access to community intervention increased from 20 to 33%. The reason might be the easy access and proper utilization extension personnel, ECPs and training by the farmers. Access to ECP and training created awareness about the new technologies intervention and enable women to build their confidence level, communication ability, self image, entrepreneurship management ability and awareness to govt. policies. The reason might be due the increase of the participation in income generating activities like sericulture in homogenous group, attending ECP and training programmes,

Farmers attitude towards sericulture to augment production, increase yield, increase income and finally to increase their standard of living, which was one of the important indicators of the level of quality living. Access to credit was one of the indicators to assess the impact of the beneficiaries. The 8.10.2 showed that the access to credit level of the beneficiaries particularly had increased to the tune of 48.53%. It was relevant to mention here that the farmers under CPP were all members of Self help group (78.57%) and these SHGs were the main source and most preferred source of micro credit for boosting their sericulture activities in more viable and income generating activity. Majority of the farmers availed loans for carrying out sericulture activities without collateral security. SHG were formed with unemployed rural youths particularly women the prime force of rural development who were caught in poverty trap due to inadequate thrift leading to low capital formation resulting stagnation of rural development.

Choudhury[1] reported that systematic adoption of recommended technologies leads to improvement of cocoon yield and thereby increases the income from sericulture.[12] Mallikarjuna observed that need to educate the farmers about the advantages of the low cost technologies by the state sericulture departments through establishing strong linkage

between the research, extension and input agency to reap the full benefit of the technologies by sericulturists

**Conclusion**

The Cluster Promotion Programme was primarily aimed at increasing bivoltine silk production by transferring new sericulture technologies to sericulture farmers. The present study conducted at Karnataka state had indicated that cluster promotion programme was facilitated in increasing production and expansion in production scale of bivoltine silk. The knowledge and adoption of new sericulture technologies pre and post of CPP indicates a significant change in farmer's attitude towards bivoltine silkworm rearing. The adoption of technology interventions at individual farmer level and at community levels had influenced to increase mulberry leaf production, dfls consumption, cocoon yield, cocoon price and income. Similarly, implementation of CPP had also increased socio economic status of farmers. Sericulture women farmers were found to have greater access to extension personnel (50.64%) and extension communication activity (53.95%) and training (40%). Access to community intervention increased from 20 to 33%, access to credit increased to tune of 48.53% and access to self help group by 78.57%. Thus implementation of CPP had increased knowledge and adoption of new technologies as well as socio economic status women farmers. It also clearly indicates that neither the availability of new bivoltine sericulture technologies nor the farmers attitude toward bivoltine silkworm rearing is an issue, but it is augmenting of transfer of technologies, is need of the hour. Thus, it may be stated that this scheme had brought in a paradigm shift in the silkworm rearing in rural Karnataka. The sustained Bivoltine Silk Production depends to a large extent on transfer of new technologies at individual and community level in a project mode with extensive planning and execution with greater involvement of the farmers in general and women farmers in particular in all stages.

**Acknowledgements**

We are grateful to Director, CSRTI Mysuru and Head of the Division of SEEM for their unconditional support and motivation in conducting the study. The study formed a part of a CPP project that assessed the impact of CIsuter Promotion Programme on Socio-Economic aspects on women sericulture farmers. The project was fully funded by Central Silk Board, Bangalore.

**Funding**

The author(s) received no financial support for the research, authorship, and/or publication of this article.

**Conflict of Interest**

The authors do not have any conflict of interest.

**References**

1. Choudhury. B. N., Das. S.C and Ahmed. M. Studies on Knowledge and Adoption level of Sericultural Technologies among the Farmers of Mizoram, Aizawl District *Imperial Journal of Interdisciplinary Research*, 2017; 3 (5): 1573-1578.
2. Dandin, S.B., Vijaya Prakash .N.B. and Hiriyanna. Institute Village Linkage Programme for improvement in productivity and quality., *Indian Silk*. 2004; 43: 5-8
3. Geetha, G. S., and. Indira R. Silkworm Rearing by Rural Women in Karnataka: A Path to Empowerment. *Indian Journal of Gender Studies.* 2011; 18(1): 89-102.
4. Geetha, G. S. Rekha, M., G. Punithavathy, Ambika and M. Raghupathi. Assessment of Current Status of Women Farmers in Sericulture Using Empowerment Indicators. *Sericologia*, 2015; 55 (2):122-128.
5. Geetha, G. S. "Socio economic determinants on adoption - a case study in Hassan district". Dissertation, submitted to Central Silk Board.1993.
6. Hadimani D.K., Moulasab, J. Ashoka and Manjunath "An Impact study of sericulture Production Technologies by the farmers of Bidar District in Karnataka, India. *International Journal of Current Microbiology and Applied Sciences,* 2017; 6(11): 2368-2374.
7. Hiriyanna, T. P., Swamy, P., Kumaresan

and Vijaya prakash, N. B., "Comparative economics of bivoltine hybrids with multihybrid cocoon production". *Indian J. Seric.*, 2002; 41(1):38-41.

8. http://www.csb.gov.in/downloads/ note-on-sericulture/
9. http://www.csrtimys.res.in/annual reports
10. Kanimozhi, V. C. "Awareness, knowledge and adoption behaviour of IVLP farmers: An ex-post facto analysis". 2001, M.Sc Thesis, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu.
11. Lakshmanan, S.; Mallikarjuna, B.; Ganapathi Rao, R; Jayaram, H. and Geetha Devi, G. " Studies on adoption of sericultural innovations at farmers' level in Tamil Nadu: an empirical analysis". *Indian J. Seric.*, 1998; 37(1): 44-17.
12. Mallikarjuna. B., Sariful Islam and Srikanta Swamy K. A Study on Knowledge and adoption of Bivoltine sericulture technologies. *Karnataka Journal of Agriculture Science,* 2009; 22(5):1113-1115.
13. Meenal, R and Rajan ,R.K. Impact of socio economic characters of sericulturists on knowledge and adoption and cocoon production in Tamil Nadu. *Indian Journal of Sericulture.*, 2011; 46(1): 49-51.
14. Saratchandra. B. Role of Extension in popularising improved sericulture technologies in different regions of India. *In National conference* on strategies for sericulture research and development. November 16-18, 2000, Central Sericultural Research and Training Institute, Mysore, India, pp.53-54.
15. Singhvi, N.R., Rao, M.K.S., Rao,Y.R.M., Iyengar, M. N. S., and Datta, R K. Knowledge level and adoption of new sericulture technology by farmers in Hunsur taluk, Mysore district, Karnataka State: An evaluation. *Indian J.Seric.*,1994; 33(1):48-5.
16. Srinivasulu Reddy, P., Sujatha, B., Kasi Reddy, B., Rao, T.V.S., Vijaya Naidu, B, and Sathyanarayana Raju, C. Knowledge and adoption of Bivoltine Sericulture technologies by farmers of Ananthpur, Chittor and Coastral districts of Andhra Pradesh-A comparative study, *Indian J. Seri.*, 2010; 49(1):70-75.
17. Vijaya Prakash, N.B. and Dandin, S.B. Factors influencing the adoption of bivoltine Sericultural practices in Mandya District of Karnataka. *Indian J.Seri.*,2005; 44(1):55-58.