



Sericulture Development in Telangana State Transpire in Improving Socio Economic Conditions of the Farming Community under Cluster Promotion Programme

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ABSTRACT

With an objective to enhance the gradable Bivoltine raw silk production the Cluster Promotion Programme (CPP) was implemented under XI & XII five year plans during 2014-2019 in India. Out of 106 clusters planned to implement CPP in Southern India for the development of Bivoltine sericulture in Telangana state, 4 clusters were identified such as Y. Bhuvanagiri and Suryapet under Nalgonda district; Metpalli under Karimnagar whereas Zaheerabad under Medak district, respectively for the development of Bivoltine sericulture. During the five years period under XI & XII five year plans the impact of CPP was noticed in the Telangana State (TS) as 42.44 lakh DFLs were distributed as against the target of 39.65 lakh with 106.58% improvement. Among 4 clusters of TS 38.92 lakh DFLs were harvested among 13,711 farmers with 2,655.1MT cocoon production generating 379.3MT raw silk inviting an average market value of Rs. 345.13 per kg cocoon. Further, during the CPP period the sericulture farming community was inspired among 4 clusters to undertake 1,874.9 acres of new mulberry plantation with V1 variety under improved spacing among 1,191 farmers contributing to the horizontal expansion of the sericulture in the state. All the above depicted achievements happened because of intensive organization of 306 extension and communication programmes (ECPs) of various kind and sensitizing more than 13,854 farmers on improved technologies and fine tuning their technical knowhow. The above findings witness that CPP implementation in Telangana State not only proved to be a successful venture but also generating confidence among the farming community as sericulture farming is assured, secured and remunerative farming practice compared to any other farming. Further, adoption of sericulture in the state not only contributed significantly in generating gradable Bivoltine raw silk but also opened avenues in improving the socio economic conditions of the sericulture farming fraternity.

Key words: Bivoltine cocoon, CPP, DFLs, Sericulture, Silkworm rearing

INTRODUCTION

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India by putting all efforts has achieved its annual raw silk production to a tune of 23,060 MT in the year 2011-12. However, there is a short fall of 5,700 MT of raw silk production considering the actual domestic requirement in the country. Moreover, about 90% of the mulberry raw silk produced in the country is of cross breed is rather non-gradable in quality and considered unfit

for the export too to gain the foreign currency. Therefore, production of gradable bivoltine raw silk has become the prime agenda of Indian sericulture industry [1,5,7]. Jaishankar and Dandin (2005) emphasised on the effective extension communication mechanisms, percolation of cost-effective technologies that fit well into the region and followed by the better interaction and involvement of Scientists, extension and field functionaries towards the end users to identify, assess and find a solution to a problem. The participatory and extension approaches by the Central Sericultural Research and Training Institute (CSR&TI), Mysore in coordination with the State Sericulture Departments of various states as described by Sudhakar *et al.*, 2019 gave tremendous results in improving as well as expanding the sericulture industry. Among them Cluster Promotion Programmes (CPP) is one such approach, which is holistic, information based and participatory extension mode with Research-Extension-Farmer (R-E-F) linkage. This approach was effectively implemented in the form of five year plans during 2008-13 for large scale promotion of bivoltine sericulture in India particularly in Southern major silk producing regions and the results were encouraging [1,3,6,7].

The Cluster Promotion Programme (CPP) was implemented under XI & XII five year plans during 2013-2019 in India for boosting the bivoltine sericulture. The Central Silk Board (CSB) and State Departments of Sericulture, have jointly organised 178 clusters all over India *i.e.*, 106 clusters in 5 states of Southern zone, 45 in 5 states of North-western zone, 11 in 3 states of Central Western Zone, 7 in 3 states of Eastern zone and 9 in 8 states of North Eastern zone, respectively. Out of 106 clusters in Southern India 46 clusters were implemented in Karnataka, 28 clusters in Tamil Nadu, 13 clusters in Andhra Pradesh, 4 in Telangana, 9 in Maharashtra, 4 in Madhya Pradesh, whereas 2 in Kerala with an anticipated 167.06 lakh DFLs brushing and generate 1920MT of bivoltine raw silk. Out of the 17 clusters of Andhra Pradesh & Telangana states, 4 clusters were selected to implement CPP in Telangana State *vis.* Y. Bhuvanagiri and Suryapet under Nalgonda district; Metpalli under Karimnagar district where as Zaheerabad under Medak district to implement CPP meticulously for the development of Bivoltine sericulture. Telangana State is situated in the central stretch of the Eastern sea board of Indian Peninsula consisting of largest area with 44,300 square meters. The state experiences with 42°C as high temperature during summer with an average temperature of 22-23°C with little humidity. Telangana having 4256 farmers spread over 33 districts practicing sericulture from the decades still the state falls under non-traditional zone for sericulture farming. Along with sericulture with subsistence of agricultural crops such as rice, corn, millet, pulses, cotton, sugar cane too will be cultivated beside sericulture. Therefore, with the above outline of the Telangana State with an anticipation of more than 2,000 MT of Bivoltine raw silk production, the Cluster Promotion Programme (CPP) was implemented scrupulously. The results were encouraging and the same were presented and discussed in the Table 1 and Figure 1, 2.

MATERIAL AND METHODS

Though the Cluster Promotion Programme (CPP) was implemented in the Telangana State among 4 clusters *viz.* Y. Bhuvanagiri and Suryapet under Nalgonda district; Metpalli under Karimnagar district where as Zaheerabad under Medak district to implement CPP scrupulously for the development of Bivoltine sericulture. Under the CPP approach in each cluster group of villages and conventional sericultural families located nearby were selected and adopted to have areas/mass effect of the improved technologies incorporated under the programme so that the activities are manageable easily with the limited technical (Scientist & Technical staff) and extension field functionaries jointly by the active involvement of local stake holders. Under this programme, contiguous villages within the radius of around 20-30km are selected to save time and money on transport and to facilitate closer monitoring and interactions of scientist as well as field functionaries with cluster farmers and to ensure good and anticipated results. One village or a cluster of villages located nearby is selected such way that as far as possible eligible farmers of villages/cluster of villages are covered under the CPP [5,7].

Before initiation of CPP a preliminary bench mark survey was conducted jointly by the Scientist of CSB and Dept. of Sericulture (DOS) in the cluster areas to understand the status of mulberry area, variety, spacing,

rearing house and rearing facilities to quantify the requirement of farmers and also funds to meet the farmers requirements. Basing on survey the assistance is provided to the farmers through Catalytic Development Programme (CDP) to strengthen the facilities, encourage and motivate the bivoltine sericulture farming under the cluster. The survey revealed that brushing of Cross Breed along with meagre quantity of other improved DFLs was ranging from 35,000 to 45,000. The cocoon yield was recorded in 42.5kg/100dfis with a meagre market value of Rs. 226/- per kg indicating sericulture was not a profitable venture for the farming community. For effective implementation of the cluster activities the following steps were imparted. In the CPP approach in each cluster group of villages and conventional sericultural families located nearby were selected and adopted to have mass effect of the improved technologies incorporated under the programme. Further, the CPP activities were easily manageable with the limited technical (Scientist & Technical staff) and extension field functionaries jointly by the active involvement of local stake holders. Under this programme, contiguous villages within the radius of around 20-30km are selected to save time and money on transport and to facilitate closer monitoring and interactions of scientist as well as field functionaries with cluster farmers and to ensure good and anticipated results. Rest of the CPP modalities were followed as depicted by Sudhakar *et al.*, 2019. The impact of CPP implementation for 5 years from 2014-2019 under the clusters, impact study was conducted to analyse the brunt of CPP on cocoon production, quality and economic gain of the sericulturists and the results are presented in Table 1 & Figure 1, 2.

RESULTS AND DISCUSSIONS

On the onset of Cluster Promotion Programme (CPP) a bench mark survey was conducted meticulously during the period 2011-13 in Telangana State (TS) to assess the initial scenario of bivoltine sericulture existence, survival and the status of technical knowhow of the mulberry cultivation and silkworm rearing practice in and around the TS clusters. Survey revealed that both bivoltine and cross breed (CB) silkworm rearing was existing in the state (clusters) to a limited level. The bench mark survey revealed that the average disease free laying (DFLs) distribution (brushing) was ranging from 35,000 to 45,000 with a meager measure of cocoon yield of 42.5kg/100dfis with a least market value of Rs. 226/- per kg cocoon indicating the uneconomic and not a feasible endeavor of adopting sericulture by the farming community. After imparting the CPP by involving all the modalities during 2014 to 2019 for 5 years during the XI & XII five year plans the sericulture has shoot up to the beyond probable levels and proved to be an effective and economically viable venture for the socio economic upliftment of the sericultural farming community (Fig. 3). The sericulture farming also established as the most trustable farming and assured respectable living style offering socio economic upliftment to the farming community. Five years efforts in implementing the bivoltine sericulture in Telangana State among 4 clusters such as Y. Bhuvanagiri, Metpalli, Suryapet and Zaheerabad were presented in the Table 1 & Figure 1.

From the perusal of the data recorded, it was noticed that the Bivoltine DFLs distribution under Zaheerabad cluster recorded highest number (11.89lakh) as against the target of 11.60 lakhs followed by Suryapet (11.40 vs 10.60), Metpalli (10.10 vs 8.75), whereas least was noticed in Y. Bhuvanagiri with 9.05 lakh against the targeted DFLs of 8.70 lakh. The DFLs brushing was ranged from 101.52% to 114.82% with an average harvesting of 106.58% among the 4 clusters. However, Metpalli recorded significantly higher DFLs brushing (114.82%) compared to other 3 clusters. Cocoon yield was recorded higher in Suryapet with 69.78kg/100 DFLs followed by Zaheerabad (67.81), Y. Bhuvanagiri (67.64) and least was in Metpalli with 63.14kg/100 DFLs. The percent of cocoon yield was achieved maximum in Suryapet (64.19%) and least was in Metpalli (48.59%). The cocoon yield was arrived to 67.09kg/100 DFLs among the 4 clusters as against the benchmark yield of 42.5kg with 64.19% enhancement of yield due to the intensive implementation of Cluster promotion programmes under the state (Table 1).

The increase of DFLs brushing and cocoon yield/100 DFLs among the farmers of CPPs under Telangana State may be due to the better adoption of critical technologies such as imparting recommended manure and

fertilizer applications and adopting soil analysis based amelioration of their mulberry gardens. Effective disinfection of silkworm rearing houses by the use of improved disinfectants such as Asthra & Serifit followed by the personal hygiene and better rearing management [2,6]. This study is also corroborated with the similar study conducted by other researchers in different clusters beneath various states [1,6,7,8].

Table 1: Bivoltine sericulture development through CPP among the clusters under Telangana State

Bivoltine Sericulture achievements through CPP during 2014-19	Clusters under Telangana State				Total/average
	Y.Bhuvanagiri	Metpalli	Suryapet	Zaheerabad	
DFLS brushing target (lakh)	8.70	8.75	10.60	11.60	39.65
DFLs brushing achievement (lakh)	9.05	10.10	11.40	11.89	42.44
DFLs brushing achievement (%)	101.55	114.82	108.42	101.52	106.58
Cocoon yield (kg/100 DFLs)	67.64	63.14	69.78	67.81	67.09
Cocoon yield increase over BM (%)	59.16	48.59	64.19	59.55	57.87
DFLs harvested (lakh)	8.89	9.86	12.23	11.20	38.92
DFLs harvesting among farmers (no)	2971	3429	4089	5295	13,711
Cocoon yield during the CPP ((MT)	605.7	659.8	868.8	768.8	2,655.1
Raw silk production during CPP (MT)	86.5	94.3	124.1	109.8	379.3
Avg. market rate during CPP (Rs/kg)	337.7	333.7	353.6	346.4	345.13
Increase of mulberry acreage (ac)	194.3	582.8	826.5	271.3	1,874.9
Mulberry acreage among farmers (no)	100	305	592	194	1,191
ECPs organized during CPP (no)	106	70	77	53	306
Farmers sensitization on technologies (no)	4329	3686	3517	2322	13,854

*BM= Bench mark yield was assessed among all the CPPs and taken the mean value as 42.5 kg/100 dfls.

Cocoon yield among 4 clusters of Telangana State (TS) exhibited higher cocoon yield and raw silk production. It was noticed that Suryapet cluster recorded 868.8 MT & 124.1 MT cocoon yield followed by Zaheerabad (768.8 & 109.8), Metpalli (659.8 & 94.3Mt) and least was in Y. Bhuvanagiri cluster (605.7 & 86.5MT). Average market rate of cocoon was ranging from Rs. 333.7 to 353.7 with a maximum rate in Zaheerabad (Rs. 346.4). Telangana State recorded a total of 38.92 DFLs harvesting among 13,711 farmers with 2,655.1MT cocoon yield with 379.3MT raw silk fetching with an average market rate of Rs. 345.13 out of 4 clusters (Table 1 & Figure 1). The results are in confirmation with the CPP programmes organized in various locations under different states [7,8]. Success of CPP implementation also may be due to intensive efforts such as imparting integrated nutrient management (INM) to improve farmers garden through green manuring by sowing sunhemp (*Crotalaria juncea*), dhaincha (*Sesbania bispinosa*), cowpea (*Vigna unguiculata*) and horse gram (*Macrotyloma uniflorus*) etc. in monsoon crops, use of integrated pest management (IPM) through the supply of biological control agents such as lady bird beetles (*Scymnus coccivora* and *Cryptolaemus montrouzieri*) for tukra and *Trichogramma chiloins* for leaf roller to enhance quality mulberry leaf production. Whereas, biocontrol agents of *Nesolynx thymus* to control Uzi menace during silkworm rearing and Asthra and Serifit as effective rearing bed disinfectants for newly evolved silkworm rearing crops were played a major role in preventing the silkworm rearing crops failures and contributing in producing enhanced quality cocoon as detailed in Tables. The improved rearing technologies

popularized among the farming group also resulted in minimizing the cocoon melting percentage. Further, it is proved that generating awareness on improved rearing technologies among the cluster farmers resulted in prevention of silkworm rearing crops failures and reduction of defective cocoon percentage leading to enhanced quality cocoon production.

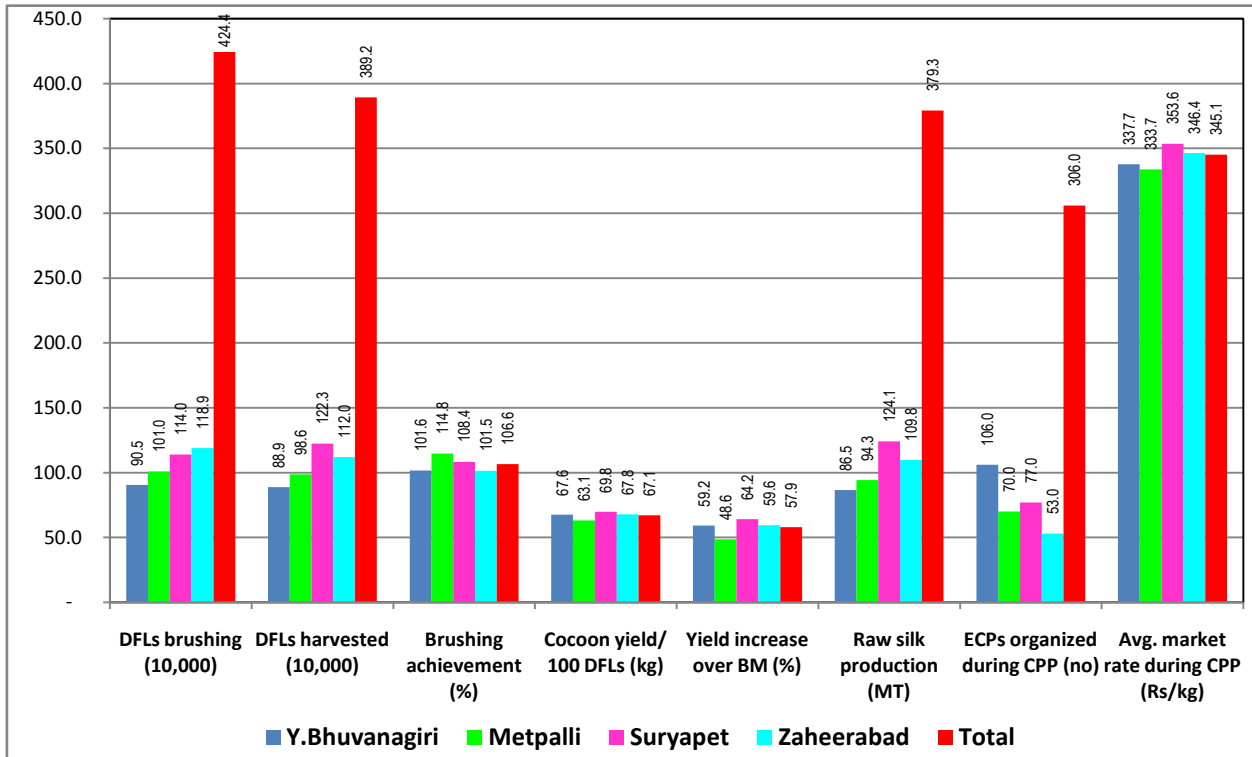


Figure 1: Bivoltine sericulture development during CPP period among the 4 clusters of TS

During the CPP implementation period (2014-19) among the 4 clusters of Telangana State 1,874.9 acres plantation was imparted among 1,191 farmers during the XI & XII five years plan. Further, the sericulturists were sensitized through the organization of various extension and communication programmes (ECPs) such as group discussions, farmers days, field days, awareness programmes, exhibitions, film shows exposure visits and skill training programmes and sensitized them to fine tune their skills on various improved technologies involved in mulberry plantation, mulberry garden maintenance and silkworm rearing. During the period more than 306 ECPs were organized and sensitized around 13,854 sericulturists by updating their technical knowhow thereby improving their Bivoltine sericulture practice for enhanced economic benefit and improving their socio economic conditions too (Figure 2 and 3).

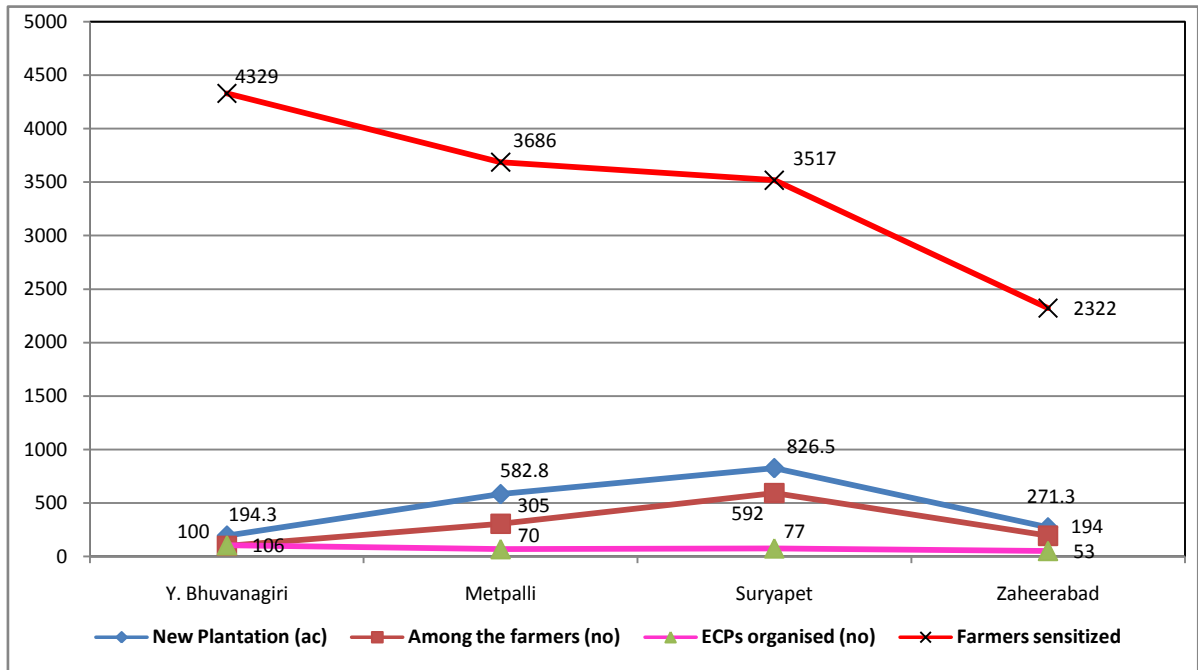


Figure 2: Increase of mulberry acreage and sensitization of farmers on improved technical know how through the organization of ECPs

During the CPP period under Telangana State cluster farmers were motivated in under taking new mulberry plantation, rearing house construction, infrastructural facilities of rearing and mulberry garden establishment by supporting under various Govt. subsidized programmes such as Catalytic Development Programme (CDP), State Sericulture Development Programme (SSDP), Mahathma Gandhi National Rural Employment Generation Programme (MGNREGA), Rashtriya Krishi Vicas Yojana (RKVY) and Prime Minister Krishi Sichayee Yojana (PMKSY) and several central Sector Schemes (CSS) etc. During the programme period under XI and XII five year plans farmers have undertaken new mulberry plantation with high yielding mulberry varieties like V1 and G4 in varied geometries such as paired row [(3'x2')5'], 3'x3' and 4'x4' in low bush form and wider spacing like 6'x3', 8'x4' and as 10'x10' spacing in tree form with partial irrigation or micro irrigation (drip irrigation) conditions to combat with the prevailing drought stricken conditions in Telangana state. During the CPP programme significant improvement in socio-economic conditions of the seri-farming community was noticed. The programme supported the farmers in adoption of bivoltine sericulture, earning encouraging money, investing the same for sericulture up-liftment, purchasing land, vehicles, jewels, house hold articles, improved children education, conducting respectable rituals and becoming self sufficient in repayment of long pending borrowed loans.

Success stories of the proven farmers under CPP in Telangana State

Under the CPP, Y. Bhuvanagiri cluster: Sri. J. Pundareekam being highly educated with multiple degrees (M.Com, M.B.A & LLB) as Software employee worked in many reputed companies of India as well as overseas. Vexed with the routine style of work with limited prospects returned back home to his village decided to initiate some farming in his 5 acres of cultivable land. Having an agricultural background constructed a huge silkworm rearing house of >750 DFLs brushing capacity/crop (100'x25'x21'size) investing more money from his pocket with a limited support of CPP. His sericulture journey began with 500 DFLs brushing/crop with 75kg/100 DFLs yield in 8 crops/annum schedules. Pundareekam achieved in generating more than 3,000 kg cocoon/year fetching with an average market rate of Rs. 450/- leading to the earnings of more than 13.5 lakh per annum. He would have not achieved his goal in sericulture without the support

of his wife Smt. Jyothi with a Post Graduate degree in Telugu literature, who looks after and supports all her husband's sericulture farming activities (Figure 1).

Under the CPP, Metpalli cluster: Sri. T. Raja Reddy a B.A. Graduate with B.Ed. qualification instead becoming a Teacher joined in some Govt. job but always exerted his interest in Agriculture side only. Started his farming in his 8 acres land cultivated several crops like groundnut, cotton, chilly, sunflower, paddy & even jasmine etc after all expenses his net income was just only one lakh per acre. Felt uneconomical with all the above farming forced him to switch over to sericulture in 2014 spending around 10 lakhs including the Govt. schemes support constructed a rearing house with 90'x30' measured rearing house with 14 shelves. Raji Reddy began his journey with 750-800 DFLs brushing per crop with an average yield of 70kg/100 DFLs with 7 crops schedule earning around more than Rs. 14.7 lakh per annum. Today he is holding a prestigious position as the unanimously elected President of the Telangana Sericulture Farmers Association and also honored with Uttama Adarsha Rythu in the year 2011-12.

Under the CPP, Suryapet cluster: Smt. Shilpa wife of Sri. N. Ravinder Rao an urbanite discontinued her graduation on health grounds. The couple decided to settle in the village atmosphere by procuring some land and startup an innovative farming. Through zinger cultivation incurred 2 lakh debts. On enquiry they came to know that the CRC avocation was an interesting and income generative. Procured 6 acres cultivable land planted with G2 and V1 mulberry varieties. Spend 4 lakh from their side and other 4 lakh with CPP support established a chawki rearing centre (CRC) simultaneously undergoing a training programme for 3 months at CSRTI, Mysore on chawki rearing and initiated the venture. In 2016 after the receipt of a CRC registration brushed 5000 DFLs through the distribution of CRC worms received 1.25 lakh returns. The sericulture farming and pleasant village atmosphere also improved her health. With her dedication and commitment she has been honored with best CRC award from Telangana Govt. and a National award from the Central Silk Board too. She has become popular among the sericulture fraternity through HMTV, DD-8, T-News and Rythu Nestham and even You Tube clippings detailing her success in sericulture and motivating the new entrants in sericulture.

Under the CPP, Zaheerabad cluster: Sri. U. Tirumalesh , S/o Mallanna, Bijawaram, Gadwal, Telangana State being an Agriculturist in his 4.0 acres of cultivable land farming with paddy, cotton and chilly. But all the said farmings resulted him with the lending of Rs. >10,00,000/- and compelled him to migrate to the Hyderabad and survive as daily wage worker to take care of his family. In the year 2014 Tirumalesh was adopted Bivoltine sericulture with the support of his mother and wife started rearing with 300 DFLs per crop, rearing minimum of 10 crops in a year harvesting above 80kg/100 DFLs average proving himself as a learned farmer. With an average market rate Rs. 380/- raised his annual income to a tune of Rs. 9.00 lakhs. Sericulture farming supported him in clearing all his financial lending, established his socioeconomic status by purchasing a pair of bullocks, built posh house and impart better education to his children (Photograph 1).



Succes story of Sri. Punreekam couple in sericulture under Y. Bhuvanagiri cluster of Telangana



Photograph 1: Success stories of the proven sericultrists under 4 clusters of Telangana State

Thus, the success of the programme can be attributed to co-ordinated and close working of different organizations involved in sericulture development such as REC, RSRS, CSRTI, Mysore, National Silkworm Seed Organization (NSSO), Central Silk Technological Research Institute (CSTRI), Bangalore and State Sericulture Department at gross root level as well as higher level for common cause. Further, the cluster approach helped in succeeding in pooling the resources such as man power, money, and infrastructural facilities etc., for conducting extension programmes effectively. The CPP offered how best the limited resources could be effectively utilized for promotion of bivoltine sericulture. Intensive ECPs undertaken under the states and active participation of the sericultural fraternity are helped the farmers to accept and adopt the improved technologies and achieve the anticipated and encouraging results in improving bivoltine cocoon yield levels significantly [1,5,7,8,9].

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