Adoption Of Tree Mulberry And Imparting Bivoltine Sericulture Replacing Mango Garden As Profitable Venture Under Cluster Promotion Programme (CPP), Shapur, Kolar- Success Story

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ABSTRACT
This paper discuss various outcome of a case study of a profitable venture under cluster promotion programme (CPP), Shapur, Kolar.

Though India has registered an impressive growth on the sericulture front, in terms of quality and productivity, yet it is often felt that there exists a gap in the yields between what the technologies could fetch the farmer and what he is actually getting. India being the largest consumer of natural silk in the world and demand for quality raw silk has been increasing in the country gradually over the years. The annual raw silk production was 20,410MT in 2010-11 due to the efforts of 9th, 10th and 11th five year plans (during 1997-2002, 2002-2007 & 2007-2012) implemented under the Cluster Promotion Programme (CPP) in India for boosting the production of bivoltine cocoon to compete with the international market to earn foreign currency as well to fulfill our own textile industry consumption, but did not suffice the actual requirement of the country. This situation could be over come with further increased production of bivoltine silk in the country. In the recent past India has registered an impressive growth on the sericulture front, in terms of quality and productivity but failing to give significant impact in the international market as because still it is trailing in the shadow of cross breed (CB) cocoon production which has no international value and did not suffice the actual requirements of the country. As a result, India had to import 5,870MT of raw silk and 3780MT silk fabrics (Himantharaj et al., 2012).

Therefore, for achieving the further anticipated goals the CPP was implemented under 12th five year plan during 2013-2017 in India for boosting the bivoltine sericulture development, for which the Central Silk Board (CSB) and state sericulture department, have jointly organized 174 clusters all over India i.e. 102 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 102 clusters in Southern India 46 clusters were implemented in Karnataka, 28 clusters in Tamil Nadu, 17 clusters in Andhra Pradesh, 4 in Maharashtra whereas 2 in Kerala with an anticipated 167.06 lakhs DFLs brushing and generate 1920MT of bivoltine raw silk. Among 46 clusters implemented in South Karnataka being one of the clusters CPP, Shapur, Kolar district was considered to implement from April, 2013 to March, 2017 with the objectives to increase production, improve productivity, ensure quality, provide strategic intervention, mobilize resources and promote bivoltine sericulture effectively in India not only to become self sufficient but also to compete with the international market and earn foreign currency.

The cluster area of Shapur, Kolar District is a famous place in the map of Sericulture of Karnataka and as well as in the country due to its age old practice of sericulture and production of...
maximum quantity of quality raw silk. Being the cottage industry sericulture has been practiced as a main occupation for the people of the District since decades. Sericulture was opted as joint venture with cattle rearing famously known as “Silk-Milk” revolution in the Kolar District. The area is a highly traditional and hard-core cross breed (CB) rearing area. Unlike other framers, the farmers of the areas are very fast in adoption of new technologies amidst of odds of comparatively higher temperature & water constraints. Under the circumstances to break the hard pan traditional practice of CB rearing by the Kolar farmers, thanks to the implementation of CPP programme in India by the combined efforts of Textile Ministries of Central and State Govt. to boost the production of bivoltine silk. As the demand-supply gap is widening in mulberry silk, there is urgent need to improve the production, productivity and quality of Indian silk for meeting the requirement for domestic market to become self-reliant by phasing out import of raw silk and compete in the international market especially in the changing scenario of the global trade (Jaishankar et al., 2005). Shapur cluster consisting with >6750 ha of mulberry spread over among >6334 farmers in >289 villages and imparting mostly with cross breed (CB) rearing Kolar gold race as because the area is highly traditional for CB rearing category and contributes in production of 6-7MT of annual raw silk. Before the initiation of the CPP programme under the cluster a benchmark survey was conducted and recorded as 60,000 DFLs/year bivoltine DFLs were brushed by harvesting 42.50kg cocoon yield/100dfls with an average market rate of Rs. 226/-. During the cluster promotion programme under Shapur cluster the farmers were motivated in undertaking new mulberry plantation, rearing house construction, procurement of infrastructural facilities of rearing and mulberry garden establishment by supporting under various Govt. subsidised programmes such as Catalytic Development Programme (CDP), State Sericulture Development Programme (SSDP), Mahatma Gandhi National Rural Employment Generation Programme (MGNREGA), Rashtriya Krishi Vikas Yojana (RKVY) and Prime Minister Krishi Sichayee Yojana (PMKSY) etc. Due to the above all most of the farmers under the cluster own independent rearing houses as well as have mulberry gardens with high yielding mulberry variety V1 in varied spacing cultivated under partial irrigation system by adopting affordable micro irrigation technologies (AMITs) in the farm of drip irrigation to combat with the prolonged drought stricken conditions.

As a part of CPP programme the sericultural farmers were exposed to all the newly evolved technologies in case of rearing maintenance and mulberry garden. Organising various extension and communication programmes (ECPs) such as Group Discussions, Awareness Programmes, Field days, Farmer days, Technology Up-gradation Programmes, Exposure visits to bivoltine sericultural areas, various kinds of Demonstration programmes in regard to rearing house disinfection, green manuring, soil sampling and biological control methods the farmers were made well acquainted with the bivoltine sericulture. Further, the farmers were made available of healthy and robust Chawki silk worms and frequent crop inspections by the field functionaries on regular intervals by preventing crop losses leading to harvest healthy and enhanced cocoons production made possible. By all the above efforts in 4 years period of CPP (2013-2017) the DFLs brushing was raised from 0.60 to 4.73 lakhs, cocoon yield from 42.50 to 70.4kg/100dfls, average market rate Rs. 226/- to 433/-, reduced defective cocoon from 7.98 to 1.15%, promoted to take up >3931 acres new mulberry plantation and sensitised >10,999 farming community through the organization of extensive ECPs during the CPP period (Table 1 & Fig. 1, 2).

Table 1: Improvement of bivoltine sericulture on various aspects under CPP, Shapur, Kolar.

<table>
<thead>
<tr>
<th>CPP Activities</th>
<th>Benchmark</th>
<th>During the CPP implementation period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2013-14</td>
<td>2014-15</td>
</tr>
<tr>
<td>No of adopted farmers</td>
<td>250</td>
<td>350</td>
</tr>
<tr>
<td>Promotion of DFLs distribution (Lakh/yr)</td>
<td>0.60</td>
<td>2.06</td>
</tr>
<tr>
<td>Cocoon yield (kg)/100 DFLs</td>
<td>42.5</td>
<td>59.0</td>
</tr>
<tr>
<td>Average Market rate (Rs)</td>
<td>226/-</td>
<td>365/-</td>
</tr>
<tr>
<td>New Mulberry plantation (acre)</td>
<td>--</td>
<td>683.7</td>
</tr>
<tr>
<td>ECPs organized (No)</td>
<td>--</td>
<td>54</td>
</tr>
<tr>
<td>No of farmers sensitized</td>
<td>--</td>
<td>1351</td>
</tr>
</tbody>
</table>

ECPs= Extension and Communication Programmes
Fig. 1: Distribution of DFLs under 12th 5 year plan during 2013-2017 at CPP, Shapur, Kolar

Fig 2: Impact of CPP on DFLs brushing, cocoon yield, market rate and mulberry acerage.
Under the CPP, Shapur Shri. Narayanappa, S/o Sammappa, Parsiganahalli village, Kolar Taluq and District was holding 1.5 acre land around his residence having Mango plantation ten years old in 20’x20’ spacing with >150 plants. Through mango plantation he used to earn Rs. 30,000-40,000/- per annum and survive with his family. After witnessing the benefits harvested by the sericultural farming community through the sericulture farming, he got motivated and taken a bold step to undertake mulberry cultivation by sacrificing the mango plantation. He uprooted the mango plantation, prepared pits of 4’x2’x4’ LBH in 10’x10’ spacing with the onset of monsoon in 2014 and filled the pits with all sorts of organic matter such as cattle & sheep dung, farm waste etc up to 2 feet height to enrich organic matter. Even though paired row spacing ((2’x3’) x5’) is an age old recommendation accommodating >5,550 plants/acre cultivated as low bush farm with channel irrigation and recommended to rear 250-300 DFLs/acre, but being bold enough with self confidence Shri. Narayanappa has undertaken V1 plantation in wider spacing (10’x10’) accommodating only 436 plants/acre as because no water source and decided to cultivate in rain fed or semi irrigated conditions using Affordable Micro Irrigation Technologies (AMITs). As there is no water resource he has collected the village drain water in a small pit as shown in the Fig. 3 using 0.5HP motor use to provide life saving drip irrigation and succeeded in establishing the tree mulberry garden with wider spacing as first time effort under the cluster and become model famer to other sericulturists to initiate tree mulberry under the CPP, Shapur. Subsequently he could also raise a rearing house of 63’x23’x14’LBH size pucca RCC slabbed with 5 tyred rearing stands having the capacity to rear >250 DFLs. Though he could approach for the State & Central sericultural Depts. support for financial assistance to do so, though the proposals are under consideration but nothing could come in time, however did not disappoint and instead waiting for he put all his efforts to become self sufficient to initiate sericulture at the earliest.

Subsequent upon the establishment of his mulberry garden he has undertaken initial two crops brushing 50DFLs/crop of CSR2xCSR4 bivoltine silkworm rearing. Though he is new to bivoltine silkworm rearing he could harvest >80kg/100 DFLs yield. Second year onwards i.e. 2015 he started his silkworm rearing crops by brushing 100-150 DFLs/ crop at his convenience. In paired row spacing the biomass of a single plant is 1.0 to 1.5kg/plant where as in tree farm the farmer started harvesting of 12-15kg biomass per plant; hence he could brush 100-150 DFLs/acre. During 2015-16 and 2016-17 Shri Narayanappa could brush an average 1000 DFLs/year in ten crops and harvest 965.21kg cocoon with 96.52 kg/100 dfls yield with Rs. 480/- market rate with a gross gain of Rs. 5,30,866/- where as from the same piece of land he was earning only Rs. 30,000-40,000/- per year through mango garden setting himself as a most intelligent, bold enough, successful and pioneer of gifted bivoltine sericulturists (Table 2).

Table 2: Bivoltine silkworm rearing performance of Shri. Narayanappa during 2015-17.

<table>
<thead>
<tr>
<th>During the Year</th>
<th>DFLs Brushed (No)</th>
<th>Cocoon yield(kg)</th>
<th>Average Rate (Rs)</th>
<th>Annual returns (Rs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Actual yield</td>
<td>Yield/ 100 dfls</td>
<td>Through Mango</td>
</tr>
<tr>
<td>2015-16</td>
<td>1000</td>
<td>930.29</td>
<td>93.03</td>
<td>450.0</td>
</tr>
<tr>
<td>2016-17</td>
<td>1000</td>
<td>1000.13</td>
<td>100.01</td>
<td>510.0</td>
</tr>
<tr>
<td>Average</td>
<td>1000</td>
<td>965.21</td>
<td>96.52</td>
<td>480.0</td>
</tr>
</tbody>
</table>
Fig 3: Narayanappa’s tree mulberry garden and successful harvesting of bivoltine cocoons.

The success of his bivoltine sericulture farming is due to:

- His enthusiasm and courage by sacrificing mango garden and taking up mulberry, investing all his earnings boldly trusting the sericultural industry is the only profitable industry.
- He is the strong believer of his hard work, commitment, dedication and devotion is the only success mantra.
- Training and molding the crown size of each tree to produce >10kg biomass/plant so that he can increase his brushing capacity.
- Uniform quality of healthy, disease and pest free leaf production through tree farm was the secret behind his bivoltine rearing success.
- He is determined to grow minimum no. of plants in the tree farm to combat with drought stricken conditions and to manage with partial drip irrigation for stable and sustainable enhanced quality leaf production.
- No deviation from the technical know-how and firm believer of the strictly imparting of recommended package of practices such as recommended manure and chemical fertilizer application followed by the imparting of green manuring, trenching & mulching during monsoon to maintain ideal soil condition and desired levels of soil reaction and nutrient status for enhanced qualitative growth of mulberry.
- First time he could also believe G4 variety is the best for late age rearing and extended his plantation to another 0.5 acre with the G4 as HYV and planted in tree farm with 10’x10’ spacing becoming encouraging and model farmer to others.
- Because of all his efforts and technical support of Central and state Govt. officials his garden become visitor friendly for future sericulturists his efforts were recorded in the farm of video and audio recordings for guidelines to all sericulturists.

Therefore, it can be concluded that if a farmer is enthusiastic, decided, determined and bold enough to take up sericulture under any circumstances nothing can stop and the Central and state functionaries are always there behind them to achieve their goals for their better future and improve their socio economic conditions.

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