Impact of JICA Programme on Sericulture Development in Tamil Nadu

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Introduction

Sericulture is a highly remunerative agro-based enterprise, characterized by fast income turnover. It provides regular employment to rural households, has a shorter gestation period and provides higher returns as compared to major agriculture crops. Sericulture has been adjudged as one of the means of rural development by the planners (Raveendra Mattigatti & Iyengar, 1995). The commercial silkworms are generally classified as multivotine and bivoltine. The multivoltines are those which complete more than two life cycles in a year in natural conditions. The bivoltine completes two life cycles in a year in natural conditions and is considered to be providing raw silk which is qualitatively superior.

Despite a quantum jump in mulberry silk production in the country since three decades, the quantum of quality silk produced has remained unchanged owing to the bulk of production from multivotine x bivoltine hybrids which is considered to be qualitatively inferior. India imports more than 5000 metric tonnes of bivoltine silk annually from China to meet the domestic demand. An attempt was made in India to introduce bivoltine silkworm rearing in order to produce internationally accepted quality silk in the country during late seventies. However it failed to get wide acceptance due to various reasons (Rajan et al., 2002). The National Sericulture Project (NSP), which was initiated with financial assistance from the World Bank during 1989-1990 to popularize bivoltine silk production, did not meet the planners expectations. Non availability of appropriate bivoltine sericulture technology, silkworm breeds suitable for the tropical conditions of India and inadequate services were serious impediments to the project. Hence, the need for the development of bivoltine breeds and packages of rearing was felt. Accordingly the JICA assisted project was initiated in the country and implemented in three phases. With the advent of Japan International Co-operation Agency's (JICA) project, the basic needs were addressed which paved the way for expansion of bivoltine raw silk production in the country.

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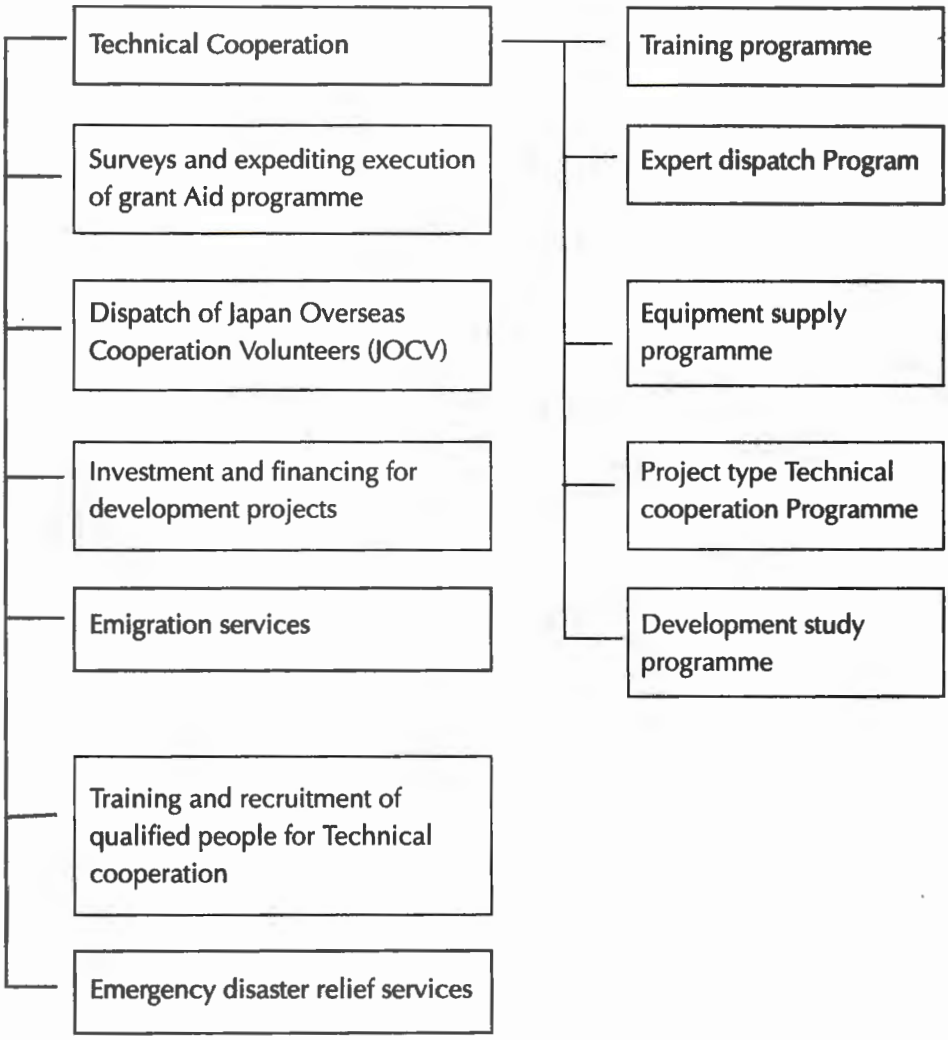
What is JICA

The Japan International Cooperation Agency, also known as JICA is a governmental organization whose main function is to execute Japan's ODA. The Japanese government extends Official Development Assistance (ODA) to developing countries to support self-help efforts that will lead to economic progress and a better life for the citizens of those countries.

The activities of JICA are as shown below:



Procedure adopted for achieving Success

A well–knit programme and formulation of an efficient management system are considered to be the key points for success. Keeping in mind that the programme requires a maximum collaboration with CSB units (CSRTI, Mysore; CSTRI, Bangalore; SSTL, Bangalore; NSSP, Bangalore and the CSB secretariat, Bangalore) and Department of Sericulture (DOS) of the respective states., the guidelines were chalked out and followed meticulously.

JICA Training Programme

The training programme for overseas participants is one of the fundamentals of JICA's technical co-operation activities for developing countries. Currently JICA is accepting about 7000 participants annually from over 140 countries and areas of the world.

Pre-requisites considered for introduction of new Bivoltine Sericulture Technology:

- In each target area the DOS should ensure a chawki rearing centre and chawki mulberry field of its own.
- The chawki rearing centre should be equipped with all relevant facilities like humidifier, heater, water supply, power and lastly a well managed mulberry field with recommended variety to support the chawki rearing.
- Cluster approach with 10-20 farmers in each Technical Service Centre (TSC).
- The selected farmers should have a separate rearing house with good ventilation.
- Farmers should have a well managed mulberry garden, preferably with improved variety, under irrigated condition.
- Selected farmers should be innovative to accept new technologies including shoot rearing.
- Farmers should be ready to prepare a mounting room.
- The farmers should be effectively supported by the extension staff of DOS and counterparts of CSB.

To guide the selected farmers, joint action was prepared regularly before rearing, involving JICA experts, CSB Directors and counterparts and DOS extension staff connected with the project on rearing, monitoring and guidance. Similarly, after each crop, the results were summarized and the remaining problems identified. The reeling parameters like single cocoon weight, quality of raw silk, defective cocoon percentage as recorded by CSTRI were considered very seriously to evaluate the progressive improvement.

Further, Bivoltine sericulture technology was demonstrated in a mission mode approach (Technology package), instead of demonstration of individual technology.

JICA programmes for Bivoltine Sericulture in India

The first phase of JICA assisted project Bivoltine Sericulture Technology Development (BSTD), in India was implemented for a period of six years (1991-97) with the objective of developing appropriate technology required for promotion and development of bivoltine sericulture technology under Indian conditions. The second phase of JICA, Promotion of Popularizing the Practical Bivoltine Sericulture Technology (PPPBST) was implemented in three southern states viz., Karnataka, Andhra Pradesh and Tamil Nadu for a period of 5 years (1997-2002) with the objective of verifying and demonstrating bivoltine sericulture technology package evolved in JICA first phase. The bivoltine sericulture technology was demonstrated in Karnataka (Mandya, Chitradurga, Tumkur, Bangalore urban and Bangalore rural districts), Andhra Pradesh (Chittoor district) and Tamil Nadu (Erode district) covering 55 villages and 148 farmers. Even though the project is completed and there is significant improvement observed with respect to cocoon yield levels, technology adoption etc., at farmers' level, there was no scientific study to substantiate the same. Hence, the present investigation was planned and carried out with the main objective of understanding the impact made by the JICA assisted programme on technology adoption and income levels of sericulturists.

Methodology

The study was conducted in Gobichettipalayam taluk of Erode district in Tamil Nadu. Thirty sericulturists were selected for the study based on irrigated mulberry garden, separate rearing shed and willingness to take chawki reared worms. Primary data were collected from the farmers before initiation of the project on different aspects such as mulberry area, silkworm reared, number of silkworm rearings in a year, number of silkworm eggs brushed for each crop, total income per year, etc. In addition, secondary information on aspects like the system of mulberry plantation, number of chawki / young age silkworm rearing centers (CRC), number of silkworm eggs brushed per unit area, late age rearing method, cocoon yield, total cocoon yield were collected from an extension agency viz., Technical Service Centre (TSC) of Department of Sericulture (DOS) Government of Tamil Nadu.

The bivoltine sericulture technology package viz., high yielding mulberry variety, paired row system of plantation, packages of practices of mulberry cultivation, mulberry pests and diseases control, productive silkworm breeds, chawki rearing concepts, silkworm shoot rearing technology and rearing package, disinfection and hygiene, silkworm pest and disease control technology was implemented with the selected farmers for 2 years

(2000-2002). After a lapse of 4 years i.e., in 2006 the data were collected again from the selected farmers and also on sericulture development in the taluk to study the impact of PPPBST project on bivoltine sericulture development in the project site. The data thus collected were tabulated and analysed by using tabular analysis.

Results and Discussion

Impact of JICA Project at Farmers' Level

The data on mulberry area, number of rearings in a year, number of silkworm eggs used per crop, income earned in a year before and after adoption of bivoltine sericulture technology of lead farmers is presented in Table 1. From the table it can be noticed that a majority of the farmers have increased their mulberry area from 1.8 acres to 4.59 acres with high yielding mulberry variety and increased the intake of silkworm eggs from 175 – 507 eggs per crop. The total income of farmers has increased 2 to 5 times from Rs. 80,000 to 1.39 lakhs, after adopting bivoltine sericulture technology. The cocoon yield of cross breed silkworms increased from 52 kg/100 dfls to 63 kg/100 dfls and the bivoltine registered a cocoon yield of 54 kg/100 dfls after the project.

Table 1. Impact of bivoltine sericulture technology at farmers level in Gobichettipalyam

Sl. No.	Parameters	Before	After
1	Mulberry area (acres)	1.812	4.594
2	No. of silkworm eggs/ crop	175	507
3	Total income (Rs. in lakhs)	0.80	1.39
4	Cocoon yield /100 Dfls (Kg)		
	a. Cross breed	52.00	63.1
	b. Bivoltine	0	54.0

Knowledge and Adoption of Sericulture Technologies before and after implementation of JICA Project

The awareness about a technology and its contribution to the success of the crop determines its adoption at farmers' level. In the present study an attempt has been made to understand the knowledge and adoption level of improved sericulture technology at farmers' level before and after the implementation of the JICA project. From Table 2, it can be seen that the JICA project has made its impact on the knowledge and adoption of almost all the sericulture technologies. The improved variety was seen with 85 per cent of the farmers after the project. The technologies like paired row system of planting

Table 2 Knowledge and adoption of sericulture technology in the study area

(Per cent)

Name of the technology	Knowledge (No)		Adoption (No)	
	Before	After	Before	After
High yielding mulberry variety	30	95	15	85
Paired row system of plantation	15	100	10	100
Packages of practices for mulberry cultivation	45	98	35	100
Mulberry diseases and pest control	05	75	0	50
Separate rearing house	0	100	0	100
Chawki rearing concepts	0	85	0	98
Shoot rearing method	10	100	5	100
Rotary mountages	20	100	5	87
Disinfection and hygiene	50	100	40	90
Silkworm pest and disease control	45	100	25	100
Productive silkworm breeds	12	80	8	95

mulberry, separate rearing house, package of practices for mulberry, shoot rearing technology and silkworm pest and disease management was adopted by all the farmers (100%) after the project. The technologies like separate rearing house and Chawki rearing concepts were highly accepted by the farmers as indicated by no knowledge of these technologies before implementation of the project and the same being adopted by almost all the farmers after the project. This may be due to the contribution of these technologies to the success of silkworm crop. The technologies like crop protection in mulberry, which is not at all adopted before the project is seen adopted by 50 per cent of the farmers after the project.

Impact of JICA project at village level

The data on sericulture activities of Gobichettipalayam before and after the implementation of project is presented in Table 3. Perusal of the table reveals that after the implementation of the project, the mulberry acreage has increased from 183 to 800 acres with high yielding mulberry variety V1, the number of sericulturists increased from 190 to 318, and total silkworm egg consumption increased from 1.52 to 7.33 lakhs. Before implementation of the project no farmer was using high yielding bivoltine silkworm hybrid (CSR hybrid). But after the project implementation, CSR hybrid layings consumption has increased from 0 to 2.22 lakhs per year. To supply healthy robust young silkworm (chawki worms) to farmers, one CRC was established under private sector.

Realizing the importance of chawki rearing concept, 3 more CRCs were established under private sector. Before implementation of the project, majority of the farmers were conducting the silkworm rearing in the dwelling house and getting frequent crop failures because of improper disinfection. After implementation of the project, the farmers understood the importance of disinfection and hygiene. Hence, a separate rearing shed and mounting hall (to keep mountage for cocoon making) were constructed. Before the project, farmers were conducting late age silkworm rearing by conventional method (rearing in bamboo trays); after the project implementation, improved and labour saving method of late age rearing viz., shoot rearing method was adopted by all the sericulturists. Due to the adoption of bivoltine sericulture technology, farmers' cocoon yield per 100 silkworm eggs increased from 42 kgs to 60 kgs, in turn the total cocoon yield increased

Table 3. Impact of Bivoltine Sericulture Technology on Sericulture Development in Gopichettypalyam Taluk

Sl. No.	Particulars	Before the project	After the project
1	Number of sericulturists	190	318
2	Mulberry area (acres)	183	800.
3	Mulberry variety	MR2	V1
4	System of plantation	3' x 3'	Paired row system
5	Number of separate rearing sheds	58	400
6	No. of chawki rearing centre	Nil	4
7	Late age rearing system	Tray rearing	Shoot rearing
8	Silkworm eggs (lakhs)		
	Cross breed	1.52	5.12
	CSR hybrid	Nil	2.22
	Total	1.52	7.34
9	Quantity of cocoons harvested (Metric tones) Cross breed	79.04	322.1
	CSR hybrid	Nil	119.0
	Total	79.04	441.1

from 79.0 to 441.0 metric tones and bivoltine cocoon yield increased from 0 to 119.0 metric tones in the taluk.

Further, it was also observed that the farmers invested their increased earnings on extension/construction of rearing house, mounting hall, purchase of land, installation of

drip irrigation system for mulberry garden, children's education, bank deposits, money lending business, telephone, colour television, two wheeler etc to improve their living standard. Technical Service Centre (TSC), Gobichettipalayam has become a model TSC in Tamil Nadu. Hundreds of farmers from the state and also from other states visit the area to observe the success story. The project has been highly acclaimed by all concerned for an impressive impact on farmers and on production of quality bivoltine silk.

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References

Rajan, R. K., Himantharaj, M.T., Singh, G. B & Datta, R. K (2000). Popularization of bivoltine sericulture technology. Indian silk. 39(6), 23-24.

Raveendra Mattigatti & Iyengar M. N. S. (1994). Role of different agricultural enterprises in agro-business with special reference to sericulture. Indian J. Seric. 33 (2), 163-165.