GLOBAL JOURNAL OF BIOLOGY, AGRICULTURE & HEALTH SCIENCES
(**Published By**: Global Institute for Research & Education)
www.gifre.org

A STUDY ON THE FACTORS INFLUENCING ADOPTION OF NEW TECHNOLOGIES IN NON TRADITIONAL SERICULTURAL AREA OF CHITRADURGA DISTRICT, KARNATAKA

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Abstract

The field study was conducted in three sericultural taluks of Challakere, Hiriyur and Molakalmuru of Chitradurga district, Karnataka during 2009-2011 with an objective to understand the socio-economic factors influencing the adoption of innovative technology by different farming groups. Total of 135 farmers were randomly selected and were grouped in to small (0.5-1 Acre), medium (1-2 Acre) and large (> 2 Acre) farmers based on their mulberry holdings. The data on various factors such as age of the farmer, education level, family size, experience, extension contact, extension participation, and mass media were collected and analyzed statistically. The data were correlated with cocoon yield, cocoon price, Dfls/acre, level of knowledge and adoption with respect to mulberry and silkworm rearing technologies. The results revealed that, the factors such as education, experience and extension contact of the farmers were significantly influenced the adoption of new technologies irrespective of holding size groups.

Introduction

India is the largest consumer of natural silk in the world and the demand for silk is consistently increasing in the country. As a result, the demand- supply gap is widening in mulberry raw silk. Hence, there is an urgent need to improve the production, productivity and quality of Indian silk for meeting the import substitute for domestic market and compete in the international market especially in the changing scenario of global trade.

Among the Sericultural countries India stands second in the production of silk. Sericulture plays a key role in the up-liftment of rural population both socially and economically. In the past two decades various technologies have been developed both in the improvement of mulberry yield and silkworm rearing technology by the concerted efforts of scientists in order to overcome the constraints and boost the bivoltine silk production of the country (Meenal, 2008). In Karnataka, the premier silk producing state in the country, the average productivity level of the cocoon was 789 kg/ha during 2011-12 (Department of Sericulture, Government of Karnataka) as against the potential yield of 1,500 kg/ha. The gap between the potential and actual yield is due to not fully exploiting and managing the recourses by the farmers to achieve high yield. Hence there is need to have new direction in planning transfer of technology information by designing more effective linkages between scientists and farmers (Hiriyanna *et al.*, 2009).

Dissemination of technology is considered more vital than the development of technology itself. Though the research organization are claiming the development of large number of technologies, the field acceptance or awareness of these technologies is rather poor resulting in a wide gap between potential of lab findings and field realization. A result the available technical knows- how is reaching the farmers in diluted way leading to incomplete information. This results in partial adoption of new technologies leading to loss of interest and confidence of the farmers towards new developments. Based on the lesions learnt from the mistakes in the past, re-examining the existing technology transfer system appears to be imperative to bring in required reforms (Dandin *et al*., 2005). Sericulture has been on the ascending trend in the non traditional Chitradurga district of Karnataka.

In Karnataka sericulture is being adopted extensively in traditional areas in Mysore, Mandya, Bangalore (rural), Kolar and Tumker Districts. In recent years sericulture is being shifting from traditional areas towards non traditional districts of Karnataka *viz*., Chitradurga, Davanagere, Bellary, Dharwad, Belgaum, Bagalkot and Bijapur due to urbanization, increasing input cost and labour scarcity. Chitradurga is located in central part of Karnataka with geographical area of 7,70,702 hectares comprising of 6 taluks *viz.*, Challakere, Hiriyur, Molakalmuru, Chitradurga, Holalkere and Hosadurga. The agriculture is mainly practiced with the help of bore well irrigation (77,227 ha) followed by canal irrigation (4,940 ha) and tanks (806 ha) which amounts to 82,973 hectares compared to 31,090 hectares in Kolar District. In Chitradurga Dt. mulberry is cultivated in 1190 hectares with 259 villages occupies 10th place in the Karnataka state, 1480 farmers (411 too small farmers with <0.4 ha, 867 small farmers with < 1.0 ha, 121 medium farmers with 1.0-2.0 ha and 81 big farmers >2.0 ha) (Table 1).

The process of acquisition of knowledge and adoption of recommended practices by the farmers depends on their profile constituted by various socio–personal, economic, communicational and psychological characteristics (Umesh *et al.*, 2007). In order to strengthen sericulture in the new area for sericulture i.e., Chitradurga and surrounding areas, new approaches for dissemination of technologies/practices have been introduced. Inspite of the introduction of technologies for the development of sericulture, there was a considerable gap in the technology adoption. The farmers of the area though are aware of the improved technologies, the adoption level of technologies varied among themselves. As the adoption of technologies is vital for getting a successful cocoon crop rather than possessing knowledge of technology, an attempt has been made in this paper to understand the factors influencing the adoption of new technologies by different farming groups.

Materials and Methods

In the present study 135 sericulturists from three sericultural taluks *viz.*, Hiriyur, Challakere and Molakalmuru of Chitradurga District were selected and were grouped into small (0.5-1acre) medium (1-2 acres) and large (> 2.0 acres) farmers, n=30, n=55 and n=50 respectively based on their mulberry acreage. The data on various factors such as age, education, family size, experience, extension contact, extension participation, mass media, cocoon yield, cocoon price, dfls/acre, area under mulberry, level of knowledge and adoption with respect to mulberry cultivation and silkworm rearing technologies have been collected and subjected to statistical analysis using SPSS software. Regression functions were fitted to the data so obtained in the field to assess the influence of various factors on the rate of adoption of mulberry sericulture technologies. The improved technologies adopted by the farmers are tabulated in Table 2.

The adoption scores were given to each technologies adopted and adoption quotients were worked out (Hiriyanna, 2009). The influence of various factors on the adoption of technologies was assessed.

Results and Discussion

The results of the study on various factors revealed as follows:

1. **Education:** The education level of the farmers had highly significant influence on the adoption level of the technologies amongst all categories of farmers such as small, medium and large scale farmers. The regression coefficient for eduction was found to be positive and significant.
2. **Age:** The age did not have any significant influence on the adoption level of technologies amongst any of the farming group *viz.,* small, medium and large farmers. This was indicated through a non significant regression coefficient.
3. **Family size:** The family size has no significant role in the technology adoption, either among small, medium or large scale farmers.
4. **Experience:** Experience has a significant influence on the adoption level of the technologies both in small and large scale farmers. The experience has shown a non significant influence on the adoption level of technologies
5. **Extension contact:** The Extension contact had significant influence on the adoption level of the technologies irrespective of small, medium and large scale farmers.
6. **Extension participation:** Extension participation did not have any significant influence on the adoption level of the technologies amongst any categories of the farmers.
7. **Mass media:** Mass media has shown a significant impact on the adoption of technologies with large scale famers while no impact is observed in respect of small, medium scale farmers in relation to the adoption level new technologies.
8. **Cocoon yield:** Cocoon yield had a significant influence on the adoption level of technologies irrespective of the farming group.
9. **Cocoon price:** Cocoon price had a significant influence on the adoption level of technologies irrespective of the farming group.
10. **Dfls:** The number of dfls brushed had no influence on the technology adoption in the area amongst all the categories of the farmers.

The results clearly indicated that the cocoon yield and cocoon price play a pivotal role in adoption of technologies as the income generated should be viable for baring the cost of the technologies adopted (Sreenivas *et al.,* 2009; Mallikarjuna *et al.,* 2008; Kumari and Rajan, 2006; Hiriyanna *et al.,* 2009). Price is a major determinant of cocoon production *vis-a-vis* the adoption of technologies. All efforts to stabilise the level of cocoon price at the market level, can be an influencing factor for the rate of adoption. Further, the other factors such as experience will help in grasping the technologies through constant extension contact and mass media. These factors are also influenced by education level of sericulturists as it is evident from this study that with high level of education there is higher level of adoption of technologies (Tables 3 to 6).

Similar studies were conducted by various authors to understand the influence of socio economic factors on the adoption level of new technologies in bivoltine sericulture (Lakshmanan *et al.,* 2011; Dayananda and Kamble, 2008; Geetha *et al.,* 2001) who have also observed the impact of socio economic characters such as education, extension contact, experience to have a significant role on adoption level of technologies. The present results also corroborate with the observation of the authors.

Conclusion

From the present study, it can be concluded that cocoon yield and cocoon price influence the adoption of technologies. Rate of education and the participation of the farmers in the extension contact, mass media programmes also hasten the rate of adoption of technologies. Extension efforts and supporting training needs of the farmers have to be dealt with properly. As Chitradurga is a new area for sericulture development, extension efforts can reap higher economic benefits to the silkworm rearers, through effective dissemination of technologies in the field.

Acknowledgement

Authors gratefully acknowledge Dr. K. Sathya Prasad, Dr. S. H. Divya Dr. S. Lakshmanan, Dr. P. Kumaresan, Dr. H. Jayaram, Dr. M.T. Himantharaj and officers of REC and DOS, Chitradurga for providing all the assistance and support for carrying out the present study.

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Annexure

Table 1: Year – wise statistics of sericulture in Chitradurga district

Year	Area under mulberry (irrigated) (ha)	Dfls harvested (in lakhs)		Cocoon production (MT)		Average yield (kg)		Raw silk production (MT)		Cocoon production per hectare (kg)	Raw silk production per hectare (kg)
		Cross breed	Bivoltine	Cross breed	Bivoltine	Cross breed	Bivoltine	Cross breed	Bivoltine		
2008-09	1164.80	11.440	1.00	690.605	49.716	60.37	49.41	95.917	8.286	635.6	90.8
2009-10	1223.00	11.439	1.04	645.015	56.703	56.38	54.33	92.145	9.450	573.8	81.9
2010-11	1143.50	12.959	1.21	753.352	68.504	58.13	56.58	104.632	11.417	718.8	102.6
2011-12	1190.00	12.580	1.360	700.654	46.183	55.70	33.96	97.313	7.449	628.0	88.04

Source: Statistics 2011-12 Department of Sericulture, Govt. of Karnataka.

Table 2: Improved mulberry cultivation and silkworm rearing technologies

A.	**Mulberry cultivation technologies:**
1	High yielding mulberry varieties-V-1
2	Wider plant spacing-paired row,3'x3'
3	Vermi composting
4	Split Application of FYM
5	Application of recommended dose of fertilizers
6	Pruning and training
B.	**Silkworm rearing technologies:**
1	Separate Rearing House
2	Disinfection and hygiene
3	CSR rearing
4	Shoot rearing
5	Incubation & chawki rearing
6	Bed disinfectants
7	Method of late age rearing & spacing
8	Mounting techniques and use of Rotary mountages
9	Use of equipments and machineries

Table 3: Factors influencing adoption of improved sericulture technology among small scale farmers (0.5 to 1.0 acre mulberry holding) n=30.

Sl.No	Independent variables	Regression Co efficient	SE	t-value
1	Constant	45.739	16.790	2.724
2	Education	0.284	0.096	2.958**
3	Age	-0.093	0.338	- 0.275
4	Family size	-0.073	0.300	- 0.244
5	Experience	0.377	0.036	10.472**
6	Extension contact	0.380	0.125	3.041**
7	Extension participation	1.569	0.987	1.589
8	Mass media	-0.378	0.492	- 0.768
9	Cocoon yield	0.023	0.007	3.857**
10	Cocoon price	0.024	0.006	4.000**
11	Dfls	-0.002	0.024	- 0.077
	R^2	0.672		
	F-Value	3.696**		

** indicate the significance level at 1%.

Table 4: Factors influencing adoption of improved sericulture technology among medium scale farmers (1.0 to 2.0 acre mulberry holding) n=55.

Sl. No.	Independent variables	Regression Coefficient	SE	t-value
1	Constant	43.627	16.321	2.673
2	Education	0.407	0.198	2.055**
3	Age	-0.061	0.072	- 0.848
4	Family size	0.237	0.187	1.269
5	Experience	0.007	0.086	0.078
6	Extension contact	1.270	0.436	2.915**
7	Extension participation	-0.289	0.221	- 1.309
8	Mass media	-0.222	0.378	- 0.588
9	Cocoon yield	-0.008	0.023	- 0.359
10	Cocoon price	0.090	0.036	2.480**
11	Dfls	0.013	0.015	0.852
	R^2	0.505		
	F-Value	2.326**		

** indicate the significance level at 1%.

Table- 5: Factors influencing adoption of improved sericulture technology among Large scale farmers (> 2.0 acre mulberry holding) n=50.

Sl. No.	Independent variables	Regression Coefficient	SE	t-value
1	Constant	112.549	30.511	3.689
2	Education	0.786	0.223	3.524**
3	Age	0.047	0.173	0.270
4	Family size	-0.715	0.411	- 1.740
5	Experience	0.208	0.097	2.144*
6	Extension contact	0.183	0.073	2.506**
7	Extension participation	0.756	0.465	1.627
8	Mass media	-0.276	0.582	- 0.475
9	Cocoon yield	0.033	0.012	2.750**
10	Cocoon price	-0.104	0.069	-1.496
11	Dfls	-0.026	0.023	-1.141
	R^2	0.609		
	F-Value	2.505**		

*and ** indicate the significance level at 5% and 1%, respectively.

Table 6: Factors influencing adoption of improved sericulture technology among different farming group (Pooled farmers) n=135.

Sl. No.	Independent variables	Regression Coefficient	SE	t-value
1	Constant	73.342	12.228	5.998
2	Education	0.080	0.027	2.963**
3	Age	-0.105	0.074	- 1.417
4	Family size	0.036	0.197	0.184
5	Experience	0.057	0.016	3.562**
6	Extension contact	0.160	0.019	8.421**
7	Extension participation	-0.387	0.272	- 1.423
8	Mass media	1.318	0.544	2.423**
9	Cocoon yield	0.013	0.018	0.726
10	Cocoon price	0.019	0.007	2.7143**
11	Dfls	-0.001	0.012	- 0.092
	R^2	0.559		
	F-Value	3.696**		

** indicate the significance level at 1%.