

Organizational Setup, Extension System and Strategy for Improvement of Sericulture Activities in Uttarakhand

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ABSTARCT

Uttarakhand is the 27th state of the country carved out of Uttar Pradesh in Nov.'2000. The climatic condition of the state is congenial for bivoltine silkworm rearing and is generally referred as 'Bowl of Bivoltine Silk of India'. In view of the bivoltine sericulture potential in the state, independent directorate of sericulture (DoS) Govt. of Uttarakhand has been established to monitor the silk activities. Need based approaches for development of silk industry have been adopted in the state by the DoS in coordination with Central Silk Board (CSB). Many high yielding silkworm and mulberry varieties / hybrids have been evolved by research organizations for its maximum exploitation at field level but goal could not be achieved due to un-systematic dissemination of the technologies. Owing to the crunch in shortage of manpower at state and CSB level, there is a need to switch over to a suitable system for further promotion and popularization of the exiting sericulture extension mechanism and to meet the gap of limited source of service personnel. Systematic extension system plays a crucial role for effective transfer of technology from lab to land. In this direction extension centres are playing important role for the dissemination / demonstration of the developed technologies and its implementation in the field by the farmers. In the present paper, organisational setup, infrastructure available in the state, extension system, methodologies, extension strategies/ approach etc adopted for development of silk industry in Uttarakhand are discussed.

Index Terms: Bivoltine, Extension, Dissemination, Uttarakhand, Sericulture.

INTRODUCTION

Uttarakhand is the 27th state of the country carved out of Uttar Pradesh in Nov. 2000. It is situated in the western sub-latitude belt of the country between 28°43' and 31°28' north latitude and 77°35' and 81°02' east longitude. The state is physio - geographically divisible into three regions- the upper or trans- Himalaya or Alpine zone having high mountains and river valleys with altitude above 1250 m ASL, Mid- Hill zone with an elevation from 800 – 1250 m ASL, the lower Himalaya and low hills and valleys up to 800 m ASL called the Shivalik Himalaya and Tarai region. This Himalayan state has a long tradition and history of silk production. Captain Hutton introduced sericulture in the hill of Massourie in the year 1858 and Messer's Lister & Company took up commercial production in a village on Dehradun - Haridwar road, which is later named as "Resham Majri". The agro-climatic conditions of the some pockets of the state are very congenial and conducive for cultivation of all the four types of natural silk viz., Mulberry, Oak Tasar, Muga and Eri. More than 90% of the silk produced in the state is from mulberry sericulture mainly bivoltine. Therefore, Uttarakhand state is generally referred as 'Bowl of Bivoltine silk of India.'

Sericulture is practiced in about 761 villages of the state out of about 16,000 villages. About 10,500 families are engaged in different facets of the silk industry. After coming in existence of the state, a separate Directorate of Sericulture with 241/339 sanctioned staff strength is functioning for over all development of the sericulture activity

In the recent years, continuous and vigorous research are being carried out by Central Silk Board, Govt. of India and other research organisations of the country to evolve high yielding mulberry and silkworm varieties suitable for tropical as well as sub-tropical climatic conditions of India. Many of the high yielding varieties are already in the field. Technologies are also developed, accordingly, for the maximum exploitation of the evolved breeds / races. Due to the poor acceptance at the farmer's level it had been felt during the course of discussions and deliberations at many forms that the dissemination of technologies is more vital

than its development, hence systematic extension plays crucial role in effective transfer of technologies from lab to land and its stabilization at field level.

INFRASTRUCTURE FACILITIES

A) At State level: In the state of Uttarakhand, following infrastructures are available with sericulture department (Table-01).

TABLE – 01

Sl.No.	Infrastructure	Details
01	Mulberry Farms	
	a). Govt. mulberry Farms (No. and area)	71No. 421.87 acres.
	b). Community CRC & Farms (No & area)	14No. 12.565 acres.
02	Bivoltine grainage	01
03	Sericulture Training School	01
04	Cocoon Market	07
05	Growth Centre (GC)	
	a). Multi end reeling units	03
	b).CFC dying unit (No)	01
	c). Fabric processing unit (No)	01
06	Multi end reeling units (Nos.)	
	a). Govt. sector (40 Basin)	04 (3 at GC and 01 at Bichpuri)
	b). Private sector	02 (01 NGO and 01 Pvt.)
07	Silk Park	01
08	Sericulture cooperative societies (No)	104
09	Self Help Group (No)	122

B) At Centre level: Central Silk Board, Ministry of Textiles, Govt. of India has also established following infrastructure to facilitate the developmental work of sericulture in the state of Uttarakhand (Table-02).

TABLE – 02

Sl.No.	Infrastructure	Nos.
01	Regional Sericulture Research Station	01
02	P3, Basic Seed Farm	01
03	P2, Basic Seed Farm	01
04	Silkworm Seed Production Centre (Mulberry)	01
05	Silkworm Seed Production Centre (Eri)	01
06	Demonstration Cum Technical Service Centre	01
07	Regional Tasar Research Station	01
08	Research Extension Centre (01-Mulberry ; 01- Oak Tasar)	02

C) At Non Govt. Level: Directorate of Sericulture, Govt. of Uttarakhand has set a target to enhance its raw silk production to 60 MT by 2030. To achieve the said target, the state Govt. requires trained manpower at various levels to manage the activities. In addition, farmers are also to be trained for adaptation of sericulture as remunerative preposition. Considering this, Directorate of Sericulture, Govt. of Uttarakhand is involving Non Govt. Sector at various level to enhance the silk production in the state so that target may be achieved by 2030. Some of which are as below:

1. A.T. India, Guptkashi (Rudraprayag).
2. Sanjivini Vikas evam Jan Kalyan Samiti, Ranikhet (Almora).
3. SUVIDA, Haldwani, Nainital.
4. HIFEED, Dehradun.

Present Status: The state has separate Directorate of Sericulture with 339 sanctioned staff's strength, against which 241 personnel's are working. The activity is spread over in 40 blocks of 12 districts. The present status of DoS, Uttarakhand is as follows (Table-03):

TABLE – 03

Sl.No.	Details	Figures
01	District covered	12
02	Block covered	34
03	Villages covered	761
04	Beneficiaries covered	10500
05	Cocoon production:	
	a) Mulberry (MT)	245
	b) Oak Tasar (Lack No)	5.0
	c) Eri (Kg)	3000
	d) Muga (No)	4500
06	Raw silk production (MT)	33.00
07	Fabric production ('000 mtrs)	30.00

STATUS OF MULBERRY PLANTATION

Approximately 8696.00 acres Mulberry plantation are available in Govt. farms as well as in private holdings as natural grown trees. There are 71 mulberry farms in the Govt. sector. The district wise detail of mulberry farms and acreage is depicted in table-04.

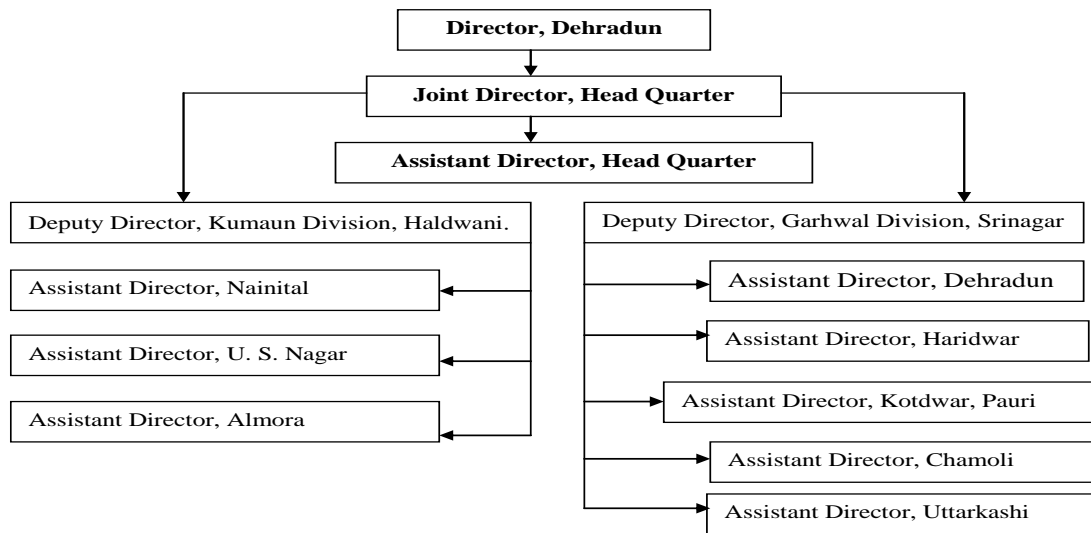
TABLE – 04

Sl.N o.	DoS & Outpost Details	No. of Blocks	No. of farms / CRCs	Total area	Area under mulberry (In Acres)	No. of Villages	No. of Rearers
A	Total at DoS level	34	71	421.87	313.26	761	6408
	District wise						
01	Dehradun	03	25	203.66	165.00	220	2714
02	Nainital	03	7	42.15	33.76	85	755
03	U.S.Nagar	01	1	9.15	6.00	121	856
04	Haridwar	03	4	23.84	15.25	44	550
05	Chamoli	05	9	30.90	16.60	35	211
06	Pauri-Garhwal	03	4	37.38	25.50	111	557
07	Rudraprayag	03	3	10.95	7.50	10	163
08	Uttarkashi	04	7	16.00	11.50	52	178
09	Pithoragarh	04	7	34.50	20.40	30	155
10	Bageshwar	02	2	9.20	6.25	27	149
11	Tehri-Garhwal	02	2	4.14	2.50	07	46
12	Almora	01	-	-	-	18	74
B	At Outpost level	09	14	12.57	08.50	-	-
	District wise						
01	Pauri	02	02	0.375	0.20	-	-
02	Nainital	02	05	02.50	02.00	-	-
03	Almora	01	01	08.00	05.00	-	-
04	U.S.Nagar	04	06	01.69	01.30	-	-

Dehradun district is the main centre of mulberry silk production in the state. About 52% of total mulberry silk production comes from this district only though sericulture is practiced in 12 districts out of 13 districts of the state.

ORGANISATIONAL SETUP OF UTTARAKHAND SERICULTURE

The head quarter of directorate of sericulture is at Premnagar, Dehradun. Further, the power is delegated to the Deputy Directors of respective divisions i.e., Kumaun and Garhwal. Each district is governed by the Assistant Directors. Mulberry farms are either headed by the Inspectors or Demonstrators of the respective areas:



SERICULTURE EXTENSION SYSTEM

The word extension is derived from latin language “Tensio” meaning to stretch and “Ex” meaning out. Hence, the technologies developed by the research organisations are being stretched out or disseminated among the stake holders through a mechanism known as extension networking. The term extension was first used in the United States of America in the first decade of Nineteen Century and the term become more popular in Indian in the post independence era with the establishment of the National Education Service in 1955. Central Silk Board (CSB) and Directorate of Sericulture are actively involved for the development of sericulture in the state of Uttarakhand. Extension is a state subject in the concurrent list in the Constitution of India, hence state Government plays a crucial role in its extension and developmental activities.

The extension activity of Central Silk Board is very limited (Table-02) and confined to preparation of literatures and Audio- Visual aids for extension teaching, problem solving, field testing of technologies for large scale popularization in the field and to educate, train and develop professionals for the extension service.

EXTENSION METHODOLOGY IN PRACTICE

Sericulture extension is basically about working with people. There are a couple of established methods of working with rural people and success or failure of extension work depends upon the effective use of methods to suit different learning situations. Extension methods are classified according to their use i.e., direct or individual contact method, group contact method and mass contact method. Extension methodologies usually followed under extension communication programmes by the extension centres of Central Silk Board are depicted in Fig.-01.

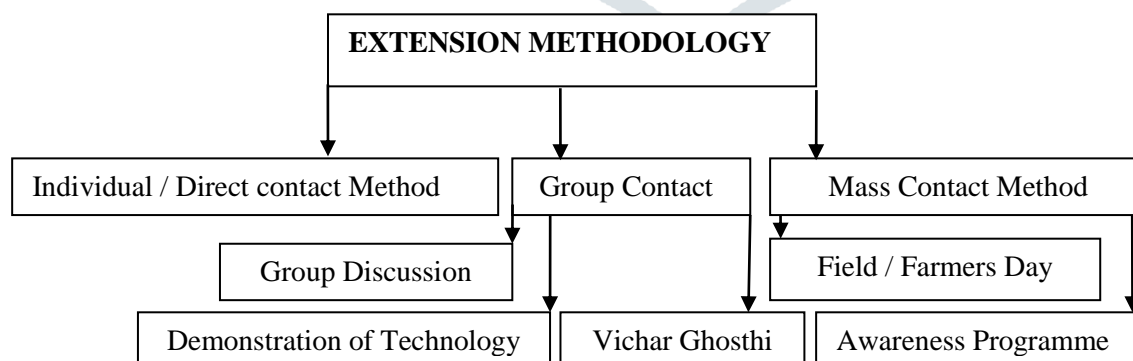


Fig. - 01: Showing Extension methodology in practice



Vichar Gosthi



Group Discussion



Field day



Demonstration of Technology

A typical extension field unit normally consists of three staff components system namely extension manager, subject matter specialist and field extension staff (field staff) as depicted in the figure - 02. Field extension staff must be familiar with local situation, local community, local leadership and other change agents. The subject matter specialist should have knowledge on local conditions and have contact with research Institutes/ stations / organizations. He should have the ability to diagnose the field problems and accordingly develop extension literature as well as train local field staff. Extension manager is the in-charge of extension team. He should have the ability to draw extension programmes according to the local needs and managerial abilities to lead the team of extension workers.

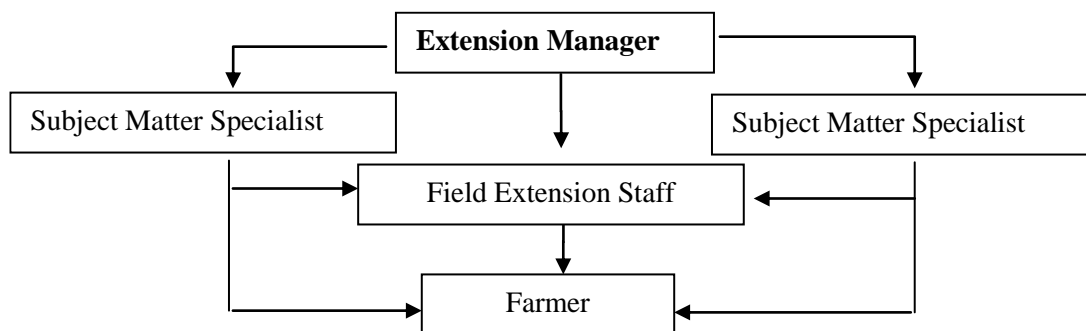


Fig. - 02: A Model field extension unit

EXTENSION APPROACH / STRATEGY

Sericulture extension has to address certain new focal issues. All these issues are related to the capacity building of sericulture farmers. Since modern sericulture consists of certain specific and distinct technologies. It can easily rely upon a simple extension strategy as farmers move from traditional system of sericulture to modern system. Here few extension approaches which in combination can serve the purpose effectively.

EXTENSION APPROACH

Cluster village approach

IVLP approach

Lead / Progressivefarmer approach

i) Cluster village approach

Instead of spreading the extension efforts too thinly over a wider area, it is better to adopt the strategy of selective cluster village approach around the extension centers. When new practices are introduced in these

villages, the opinion about the technology will get quickly circulated among the people through the normal social inter actions. The Cluster Promotion Programmers are being implemented considering the cluster farmers approach in villages supporting bivoltine sericulture in the country since XI plan. In each of these villages, voluntary groups of farmers are chosen for extension contacts. Since extension is essentially a result - oriented effort, the improvement in sericulture processes and products brought about in these groups will circulate quickly. As the ratio between farmer and extension worker is widening, the cluster approach helps in effective technical guidance to farmers with the limited number of scientists and extension workers. The cluster approach ensures an integrated response, drawing upon the comparative advantages of all the agencies working for sericulture development, fund and programme and leveraging resources through inter-agency partnerships. Further, it ensures coordination among different agencies, joint programming, information and knowledge sharing by combining support and common services. Thus, the Cluster approach had proved to be an emerging tool which helped to bring out high impact on the overall crop improvement among the farmers adopting the latest technologies developed by CSB Research Institutes. In this direction, Central Silk Board in association with Directorate of Sericulture, Uttarakhand has started seven clusters viz., Kalsi, (Dehradun), Tiparpur (Dehradun), Maldevta (Dehradun), Lalwala (Haridwar), Pauri (Pauri Gharhwal), Thari-giantigaon (Nainital) and Kopa-chankpur (U.S.Nagar) The details of the farmers covered under said clusters are given in the table – 05.

Table-05

Sl. NO.	Name of the cluster	Nos. of farmers						
		Total	Male	Female	SC	ST	OBC	Gen.
1	Maldevata	324	202	122	85	04	-	235
2	Tiparpur	250	205	45	01	239	05	05
3	Kalsi	250	157	93	61	164	21	04
4	Lalwala	410	273	137	393	-	15	02
5	Pauri	571	345	228	239	-	-	334
6	Kopa chankpur	729	637	92	98	257	157	198
7	Thari-gintigaon	495	449	46	66	30	05	394

ii) Institute Village Linkage Programme (IVLP) approach

The technology assessment and refinement is essential to assess the requirement of silkworm rearers in different agro-climatic and socio-economic conditions to harness the benefits of research in improving the quality and yield. Institute Village Linkage Programme shall be a participatory approach of scientist, extension staff of CSB as well as DOS of the respective target groups. The programme was started with following objectives:

1. To identify the problem being faced by the sericulture farmers by understanding local production system and environmental conditions.
2. To popularize advanced/improved technologies pertaining to host plant and silkworm rearing among the silkworm rearers through various extension communication programmes, Demonstration of Technologies & trainings.
3. To study the impact on the yield and quality after analyzing adoption levels of technology.

The concept of IVLP is participatory approach of silkworm rearers of the targeted area with mutual trust and cooperation of Resource Management (manpower, technology and inputs) by stable and sustainable adoption of proven technology package. In the implementation of this programme, investigators from concerned REC's, DOS representatives, subject matter specialist and Coordinators of the programme was actively involve for its success.

Under said programme, 100 beneficiaries were identified in Jhabrera area of Haridwar district. Rearing infrastructure was strengthening by supplying 30 plastic rearing trays and 40 collapsible plastic mountages to the identified beneficiaries.

iii) Lead / Progressive farmers approach

In view of decreasing staff strength, lead farmer concept is very much necessary for the silk industry. In this direction, creating a model silk farmer in each village of the State is the latest attempt by the State government to promote sericulture. Each identified farmer would be a model, who is expected to inspire other farmers in the village to take up sericulture. As group approach and farmer-to-farmer extension are found

effective hence the extension workers should select a local leader amongst the rural people of the region and guide to form a self-help groups/ quality clubs among the rearers. The local leader should be trained and utilized for extension work. He will be comfortable to motivate the farmers for adoption of new technologies with least reluctance. The services of such farmers will be taken as Resource Person to support extension system in transfer of improved technologies and will be named as **lead** farmers. A 'Lead farmer' was identified from each cluster and his mulberry field was taken as a demonstration plot, where other farmers visit. They may encourage replicating it on their land. This approach serves not only in rendering the new practices more acceptable to the potential adopters as locally validated ones but also in evolving local spokespersons. This goes a long way in the autonomous spread of the new technologies. Lead farmers play a major role in disseminating the ideas and knowledge underlining the successful crop benefits gained from sericulture. Farmers from neighbouring pockets may also get better awareness on the success of sericulture crop through interacting with the Model farmer. In this direction, Cluster Promotion Programme, involving Central Silk Board, Directorate of Sericulture and NGOs ie. Gramin Evam Krishi Vikas Samitty (GEKV) is on progress in district Udham Singh Nagar. Involvements of lead farmers or progressive farmers are taken in to account during implementation of the said programme.

TRAINING

The Capacity Building and Training (CBT) is one of the six new components of the Central Sector Schemes on Silk. The quality of human resources and the skill-levels of its stakeholders directly influence the health and growth of an industry. Though Sericulture is an age-old practice in Uttarakhand, the Sericulture and Silk industry as a whole lacks adequate trained and skilled manpower. Human resources play a crucial role in the developmental process of modern sericulture, there is a need to train the peoples from farmer's fraternity to minimize the crunch in shortage of manpower at state and Central Silk Board (CSB) level. Central Silk Board, Ministry of Textiles, Govt. of India, since inception has been a very strong training and capacity building organization. It is committed to promote entrepreneurship and empower the stakeholders in different sub-sectors and activities of sericulture and silk (Soil to silk) by sharing relevant technology-related information and knowledge, skill seeding and up-grading the skill-sets, refining various concepts, processes and technologies, through a variety of meticulously designed, need-based, quality training programmes. Capsule courses are usually organized covering specific activity / technology of Mulberry sericulture sectors. Need based training programmes are also being organized by Regional Sericultural Research Station, Central Silk Board, Sahaspur as per the requirement of the sponsoring organization/agencies on cost basis for staffs, farmers and students of different colleges. DoS, Uttarakhand is also organizing training programmes for their staffs and sericulture farmers. The training programmes organized by Regional Sericultural Research Station, Central Silk Board, Sahaspur and its nested units are given in table-06.

Table-06

Sl. No.	Topic	Batches	Duration	Tentative Schedule	Seats / Batch	Remarks
1.	Disinfection Methods (Rs.250/- per candidate)	04	02 days	Sept- 01 Oct- 01 Feb. - 01 Mar. -01	20 / batch	Before & after silkworm rearing.
2.	Silkworm Disease Management (Rs.250/- per candidate)	04	05 days	April- 01 Sept.- 01 Oct. - 01 Mar.- 01	20 / batch	During silkworm rearing.
3.	Mulberry Cultivation Techniques (Rs.250/- per candidate)	04	10 days	July - 01 Aug.- 01 Dec. - 01 Jan. - 01	20 / batch	During monsoon and winter.
4.	Chawki Rearing Technology (Rs.500/- per candidate)	02	10 days	Sept. - 01 Feb. - 01	20 / batch	During Chawki rearing.
5.	Mother Moth Examination (Rs.250/- per candidate)	04	05 days	May - 02 Nov. - 01 Dec. - 01	05 to 10 / batch	After completion of spring &

						autumn rearing.
6	Intensive Bivoltine Training in Sericulture for farmers (Rs.3000/- per candidate)	02	45 days	Mar.-Apr. Sep. – Oct.	10 to 20 / batch	During spring & autumn rearing.

STRATEGIES FOR UPLIFTMENT OF SERICULTURE

State of Uttarakhand is divided in two division's viz., Garhwal and Kumaun. Following activities have been initiated for upliftment of sericulture activities in the state.

i) Implementation of Tribal Sub Plan (TSP) under sericulture

Sericulture holds unique distinction to create employment and job opportunities to poor and downtrodden rural families. It acts as a tool for poverty alleviation and helps to prevent migration of local youth to urban areas and improving their social status. To empower Scheduled Tribe families, CSB has been implementing the project namely "Empowerment of Scheduled Tribe families through Sericulture under Tribal Sub-Plan (TSP)" exclusively for empowerment of Tribal families through implementation of sericulture schemes / components in coordination with DoS, Uttarakhand. This project is being implemented in Bazpur block of Udham Singh Nagar (U.S.Nagar) by the States in coordination with the local Research Extension Centre of Central Silk Board functioning from Haldwani, Nainital. All the beneficiaries of TSP will get higher subsidy on line with special status states. 600 beneficiaries have been identified and mulberry plantation has been raised under programme.

ii) Implementation of Schedule Cast Sub Plan Programme

300 farmers have been identified under this programme and mulberry plantation has been raised under SCPC in Kotabagh area of Nainital district. This project is being implemented by the States in coordination with Research Extension Centre, Central Silk Board, Haldwani, Nainital. All the beneficiaries of SCSP will get higher subsidy on line with Special Status of the State.

iii) Establishment of Sericulture Resource Centre (SRC)

The training cum facilitation centres is being established in selected Mulberry Bivoltine clusters to act as an important link between Extension Centres of R&D labs and the beneficiaries. The purpose of this SRC is - technology demonstration, skill enhancement, one-stop shop for Seri-inputs, doubt clarification and problem resolution at cluster level itself. This centre is managed by handpicked lead/ elite farmers or any 'not for profit' organizations, Seri-Societies etc for the benefit of cluster farmers/ sericulturist. The unit cost for establishing and managing each SRC is proposed for Rs.3.50 lacks, out of which, Rs.3.00 lacks (Capital) has been earmarked for meeting one-time expenditure of construction of Training shed (300 sq ft) and procurement of training /demo equipments viz. TV, projector, black board, basic furniture etc and Rs.0.50 lack (Revenue) for meeting recurring and miscellaneous expenditure for conducting training. The mandate of SRC is to conduct at least 12 training /demo sessions every year. In Uttarakhand, Sh. Guman Singh has established Sericulture Resource Centre (SRC) at Village - Nauda, Kotabagh in district Nainital under close supervision of Directorate of Sericulture, Govt. of Uttarakhand, Haldwani and Research Extension Centre, Central Silk Board, Haldwani, Nainital.

iv) Application of IT tools in Sericulture and its expected outcome

It is also planned to introduce IT tools for better extension management among the seri-farmers in updating the latest know how on crop performance and farm management. There is wide scope to promote Information and communication technologies (ICT) based communication system for proper understanding of the sericulture activities among farmers for their crop improvement. Introducing of one such ICT based media is to develop suitable user friendly Mobile Apps where farmers can freely interact about their day today activities, issues in sericulture and also solve their problems through CSB expertise. All the sericulture farmers are needed to be covered under this umbrella of Mobile based sericulture applications to update their technology knowledge and utilize in crop improvement. Information and communication technologies (ICT) are now being used widely, with remarkable positive results to perform these tasks in agricultural development and other allied sectors. Mulberry sericulture forms a part of agriculture sector in India, where a large number of farmers participating in production silk cocoons in far off places. A new technology

developed by CSB through Android Mobile App to collect precise and valuable information from the farm households for evaluation. The App to be developed with good validation mechanism for easy operating to prevent false data being entered into the system to eliminate the risk of refactoring the received data, when extensively introduced into the sericulture sector, will have a positive impact on many critical issues.

Regional Sericulture Research Station, Sahaspur, Dehradun is providing regular information to the sericulture farmers through e-kisan for maintenance of mulberry gardens and other activities time to time. Cluster information was loaded on Seri 5 k.

IT Initiative taken by Regional Sericulture Research Station, Central Silk Board, Sahaspur, Dehradun

m-Kisan	CSB has widened the outreach of scientists and experts to disseminate information to provide scientific advisories to farmers through their mobile telephones using m Kisan Web Portal mkisan.gov.in
Seri 5 k	Seri 5 k is designed and developed as a database of Bi-voltine cluster farmers of all over India.

Tips for Extension Workers

It is observed that people have different views on developed technology and the extension workers do not deviate from the written technology though situation demands for certain modification. The following points may be useful in extension work.

1. The main object of the extension is to disseminate the developed technology with modification to local conditions. For the same, the extension workers should have complete know - how and confidence so that he can motivate the farmers to adopt the new technologies.
2. The extension worker should have idea of the area of operation, familiarity and infra - structure available with the farmers.
3. Extension worker should trace out the problems at the initial stage and try to solve or refer to the concern scientist / officer for suitable solution.
4. The behavior of extension worker should be cordial with the farmers / rearers.
5. Extension workers should have clear idea of the technologies to be disseminated with practical experience.
6. Extension workers should have the idea of local available material, which could be used in demand.
7. Extension workers should involve him-self in the demonstration of technologies.
8. Extension workers should have knowledge of local languages for effective communication with the farmers.
9. Extension worker should visit regularly to the farmers even in off-season to avoid communication gap.
10. Extension workers should select needy and genuine farmers for developmental schemes to avoid resentment of the farmers.

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