CENTRAL SERICULTURAL REREARCH & TRAINING INSTITUTE, MYSURU

MINUTES OF 50th RESEARCH ADVISORY COMMITTEE MEETING HELD ON 11th & 12th SEPTEMBER 2023 AT CSRTI, MYSURU

The 50th Research Advisory Committee meeting of CSRTI-Mysuru was held on 11th & 12th September 2023 at CSRTI - Mysuru to review the progress of on-going projects, concluded projects, new projects, pilot study, TOT, Training and extension activities of the institute and its nested units for the period from April 2023 to August 2023. The meeting was chaired by Dr. Mahadev B. Chetti, Chairman RAC, Vice Chancellor of Sanskriti University, Mathura, Utter Pradesh and former Vice Chancellor, University of Agricultural Sciences (UASD), Dharwad. The list of the participants is appended as **Annexure - I**.

Dr. S. Gandhi Doss, Director, CSRTI, Mysuru, welcomed the Chairman, members of RAC, Dr. S. B. Dandin (in absentia), Former Vice-Chancellor, UHS, Bagalkote; Dr. N. K. Krishna Kumar, DDG-Hort-Science (Retd.) & RAC-Chairman, SBRL Kodathi, Bangaluru and Director, CSTRI, Bengaluru as invitees. He welcomed all the Heads of Divisions / sections, scientists and JRFs, SRFs, PAs of the main institute and all scientists from RSRSs and SSBS, Conoor, who attended the meeting.

The Chairman in his introductory remarks welcomed once again all the members, invitees and the scientists of CSRTI, Mysuru to the meeting. He suggested that the extension mechanism to be strengthened to expand sericulture in the non traditional areas. He also advised to focus on major problems *viz*., non availability of cocoon market in north Karnataka region, mechanization to reduce the drudgery in sericulture , awareness on disease and pest mangement in mulberry and silkworm among the sericulturists. Dr.N. K. Krishnakumar, DDG (Horti) advised to make efforts to reduce the cost of silk and make it affordable to all.

1. R&D HIGHLIGHTS OF INSTITUTE AND NESTED UNITS DURING REPORTING PERIOD (APRIL 2023 to AUGUST 2023).

Dr. S. Gandhi Doss, Director made a brief presentation of the R&D highlights of the institute and nested units during the reporting period (April 2023 to August 2023). The Chairman and the committee expressed satisfaction over the progress. RAC Chairman opined that cumulative NAAS rating need not be used in the presentation and the highlights should be in bullet form, crispy, result oriented with quantified data.

2. CONFIRMATION OF THE MINUTES OF 49th RAC MEETING HELD ON 17th & 18th MARCH 2023.

The Research Advisory Committee approved the minutes of the 49th RAC meeting as no comments were received from any of the members.

3. REVIEW OF FOLLOW-UP ACTION TAKEN ON DECISIONS OF 49th RAC MEETING

The follow-up actions taken on major decisions of the previous meeting was presented by Dr. S. Balasaraswathi, Scientist-D and Head, PMCE. The committee expressed satisfaction regarding the follow up action taken.

4. REVIEW OF CONCLUDED PROJECTS

1. **PIB-3633 - Development of highly productive and widely adapted mulberry using exotics and wild germplasm**

Decision: Arunakumar, Sci-C presented the results of the concluded project and the committee advised to take opinion from the experts for short-listing of hybrids for further evaluation under PYT.

(Action: Arunakumar, Sci-C, Mol. Biology)

2. PILOT STUDY: Isolation, identification and characterization of drought tolerant plant growth promoting microbes.

Decision: Divya Singh, Sci-C presented the results of the concluded pilot study and the committee suggested to evaluate bacterial isolates on mulberry plants to confirm plant growth promoting activities.

(Action: Divya Singh, Sci-C, MPL)

5. NEW PROJECTS FOR APPROVAL

1. Synthesis and characterization of nano-formulations and their evaluation in mulberry cultivation

Decision: E.Bhuvaneswari, Sci-C presented the details of new project with referee comments. The committee approved the proposal with suggestion that instead of characterization / synthesis of new nitrogenous nano particles, it is advised to evaluate the available nano fertilizers in mulberry and hence it is not required to take up toxicological studies. The term nano formulation needs to be changed as nanofertilzer. Accordingly it should be revised and submitted to RCS.

(Action: Dhaneshwar Padhan, Sci-C, Agronomy)

2. Utilization of Japanese genetic resources for the development of bivoltine silkworm hybrids for robustness and high productivity

Decision: N. Chandrakanth, Sci-C presented the details of the project. The committee approved the proposal with a suggestion to modify the title and to include quantified productive traits.

(Action: N. Chandrakanth, Sci-C, BBL)

6. REVIEW OF PROGRESS OF ON-GOING PROJECTS

1. PIB 3632: Evaluation of superior triploid genotypes for yield and adaptability under varied agro-climatic conditions

Decision: M. K. Raghunath, Sci - D presented the progress of the project and the committe advised to conduct bioassay with the standard rearing protocol.

(Action: M. K. Raghunath, Sci-D, MBG)

2. PIE 13001 MI : All India Coordinated Experimental Trials for Mulberry (AICEM) –Phase-IV

Decision: Manjappa, Sci - C presented the progress of the project and the committee advised to record the data on the incidence of diseases and pests in the next RAC.

(Action: Manjappa, Sci - C, MBG)

3. PIE 01022 SI: Evaluation of promising mulberry genotypes for higher leaf yield and resistance to root rot and root knot diseases in Primary Yield Trial

Decision: Manjappa, Sci-C presented the progress of the project and the committee agreed to include additional twelve test genotypes with already proposed genotypes in the study.

(Action: Manjappa, Sci - C, MBG)

4. PRP 01015 SI : Identification, evaluation and inclusion of potential antagonistic microbes

in Integrated Root Rot Disease Management in Mulberry

Decision: Arunakumar G.S presented the progress of the project. The committee noted the progress and advised to present the concluded report before RAC members by conducting an on-line meeting within 15 days after completion of the project. Further, the suggestions of RAC members must be incorporated in the concluded report before submiting to RCS.

(Action: G. S. Arunakumar, Sci - C, Molecular Biology & Mulberry Pathology)

5. **MOE 01021 SI: Evaluation and popularization of improved technologies developed in the field of mulberry sector for South India**
   Component 9: Impact of drip fertigation technology on mulberry productivity

Decision: R. Mahesh, presented the progress of the project and the committee approved the extension of project duration up to March 2024 (five months) in order to collect five crops data at all the test locations.

(Action: R. Mahesh, Sci - C, Agronomy)

6. **AIB 01009 MI: Evaluation of new bivoltine silkworm double hybrid TT21 x TT56 at farmers level for authorization and commercial exploitation**

Decision: K.N. Madhusudhan, Sc-D, presented the results of the project and the committee noted the progress and suggested to complete the set milestones under the project within the extended period already approved by RCS.

(Action: K. N. Madhusudhan, Sci- D, BBL)

7. **AIT 01019 SI: Screening of drugs / Inhibitors to inhibit the PI3K-Akt pathway in *Bombyx mori* for controlling Nuclear Polyhedrosis Virus infection.**

Decision: G. Mallikarjuna, Sci - C, presented the progress of the project. The committee noted the progress and advised to present the concluded report before RAC members by conducting an on line meeting within 15 days after completion of the project. Further, the suggestions of RAC members must be incorporated in the concluded report before submitting to RCS .

(Action: Mallikarjuna G, Sci - C, S.W.Pathology)

8. **AIC 01023 SI: Development of Spectroscopic Tests for Insecticide Resistant Biomarkers in silkworm, *Bombyxmori***

Decision: Sathish L, Sci - C, presented the progress of the project and the committee advised to take up a multi-disciplinary project to address the non-spinning syndrome of silkworm by involving all the stake holders and also to standardize the paper strip method for detection of pesticides in the hemolymph.

(Action: Sathish L., Sci - C, S.W.Pathology)

9. **AIB 01024 MI: Development of productive, autosexing silkworm breeds/ hybrids of *Bombyxmori* L. in egg stage and separation of male silkworm population by optical sorting.**

Decision: Kusuma L, Sci – C, presented the progress of the project and the committee noted the progress.

(Action: Kusuma L., Sci - C, BBL)

10. **MTL 01025 MI : Life cycle assessment of mulberry silk: A National Assessment**

Decision: Amit Kumar, Sci - D, presented the progress of the project. The committee noted the progress and advised to conduct an on-line review meeting with the members of the review committee onece in a

quarter for monitoring the progress and to avoid unnecessary delay.

(Action: Amit Kumar, Sci -C, SSC)

11. **AIE 01026 MI: Evaluation of new bivoltine double hybrid, BFC1 x BFC10 at farmers level for authorization for commercial exploitation.**

Decision: K. B. Chandrashekar, Sci - D, presented and the committee noted the progress of the project.

(Action: K. B. Chandrashekar, Sci -D, BBL)

12. **BPS 01027 CN: Immunomodulatory and Adjuvant effects of Chitosan Nanoparticles Extracted from *Bombyxmori***

Decision: Madhusudhan K. N, Sci - D, presented and the committee noted the progress of the project.

(Action: Madhusudhan K. N, Sci - D, BBL)

13. **BPS 01028 CN: Value Addition of Cellulose and Chitin Isolated from Sericulture Waste for Advanced Packaging Applications**

Decision: Madhusudhan K.N,Sci -D, presented and the committee noted the progress of the project.

(Action: Madhusudhan K.N, Sci -D, BBL)

14. **ARE01029MI: Recommendations of novel fungicidal and insecticidal applications for mulberry**

Decision: S. Mahiba Helen, Sci - D, presented the progress and the committee noted the progress of the project.

(Action: S. Mahiba Helen, Sci - D, PML)

15. **PRE 01030 CN : Development of an integrated management package for the broad mite, *Polyphagotarsonemus latus (*Acari: Tarsonemidae), in mulberry**

Decision: S. Mahiba Helen, Sci - D, presented the progress and the committee suggested to study the safety of the pesticide Gaiagen against CSR2. The PI is advised to consult Prof. Chinna Madegowda, UAS, GKVK, Bangalore for all the research work related to broad mite.

(Action:S. MahibaHelen,Sci-D,PML)

16. **MOE 01031CN: Technology Demonstration and Evaluation of Rearing Performance of Bivoltine Mulberry Sericulture in Navasari District (Gujarat)**

Decision: Jadhav Ashok Limbaji, Sci - C, presented the progress of the project and the committee advised to speed up the construction of rearing house without any further delay and all the milestones proposed under the project should be achieved within the stipulated project period.

(Action: Jadhav Ashok Limbaji, Sci - C, REC, Parbhani)

17. **AIB 01032 SI: Validation of silk regulators - ubiquitin and mannosidase among silkworm breeds**

Decision: Kusuma L, Sci - C, presented the progress of the project and the committee suggested to verify the breeds taken for analysis based on the contrasting silk quality parameters.

(Action: Kusuma L, Sci - C, BBL)

18. **ARP 01033 CN: Mulberry Silkworm Disease Monitoring and Management in Southern States of India.**

Decision: G. Mallikarjuna, Sci - C, presented the progress of the project and the committee suggested to increase the sample size and to revisit the places of disease incidence for generating accurate data for logical conclusion.

(Action: Mallikarjuna G, Sci - C, S.W.Pathology)

19. Pilot Study: Development of process for production of Bio refinaries from silkworm rearing waste

Decision: Y.Thirupathaiah, Sci - C, presented the progress and the committee noted the progress of the project.

(Action:Y. Thirupathaiah, Sci - C, S.W. Physiology)

ItemNo.7: Progress of RSRSs and SSBS,Conoor

RSRS, Kodathi

V. Lakshman, Sci - D, presented the progress of activities of CBT, ECPs and CPP activities and the committee noted variation in the grade of silk in the bio assay results on the post cocoon parameter presented under PIB 3632 which can be ascertained by CSTRI, Bengaluru in the second bioassay.

(**Action**: V. Lakshman,Sci - D, RSRS Kodathi)

RSRS, Ananthapur

K.P. Kiran Kumar, Sci - D, presented the activities of CBT, ECPs and CPP activities and the committee noted the progress.

(Action : Srinath , Sci. - D, RSRS Ananthapur**)**

SSBS Conoor

V. Vijay, Sci - C, presented the activities of the station and the committee noted wide gap between the silkworm crops which needs to be stream lined by utilizing the infrastructure effectively. Also advised to speed up the proposal to repair the compound wall of office premises.

(Action: V.Vijay, Sci - C,SSBS Conoor)

RSRS, Chamrajanagara

L. Satish, Sci - C, presented the activities of the station and the committee noted the progress.

Item No. 8. Extension and otherprogrammes

R. Bhagya, Sci-D, SEEM presented the progress of Extension Division and the committee noted the progress.

(Action: Sci - D, SEEM**)**

Item No. 9. Training (Capacity Building and Training) and other programmes

R.Meenal, Sci – D, presented the progress of Training Division. The committee noted the progress.

(Action: Sci - D, Training Division**)**

Item No. 9. Sericultural Engineering Disivison

R. Mahesh, Sci - C demonstrated the rechargeable battery operated dusting machine for chawki and late age silkworm rearing. The committee appreciated and approved the same for validation with farmers, patenting and commercialization.

(Action: R. Mahesh, Sci - C, Sericultural Engineering Division)

ItemNo. 11. Any other points for discussion

Dr. S.B. Dandin, RCC member, submitted a note for discussion in 50th RAC (Annexure II). The same was discussed in his absence and following decisions were taken.

1. The committee felt that as most of the points were in the perview of policy matter, the said points may be discussed in the RCC meeting of CSB.

2. Institute needs to take up research projects for development of suitable silkworm breeds and mulberry varieties to mitigate the challenges due to climate change.

   (Action: DC Mori., DC Seri.)

3. Reseach projects may be proposed to encourage mechanization in sericulture viz., labour-saving devices and appliances to reduce drudgery and to overcome manpower shortage.

   (Action: FMS & SED)

4. Institute may take up study to suggest control measures for the widespread infestation of thrips, mites, etc. in the field.

   (Action: Dr. S. Mahiba Helen, Sci - D, PML)

5. Institute may propose multidisciplinary approach to mitigate the incidence of non-spinning worms in the field.

   (Action: DC Seri / S.W.Pathology / S.W.Physiology)

Concluding remarks by RAC Chairman and members

DOS Karnataka

- Newly developed mulberry varieties, silkworm breeds and sericulture technologies need to be popularized among the farmers.

DOS Tamil Nadu

- Requested for integrated pest management practices for the control of widespread infestation of thrips, mites, *etc* in the field.
- To suggest control measure for root rot infecting mulberry and non-spinning syndrome in silkworm in the field.
- Impart training on bivoltine sericulture technologies to the staff of DoS, Tamil Nadu.

Dr. K.Narayana Gowda

- The project proposal should have detailed methodology including statistical methods to be followed.
- Wherever applicable, BC ratio need to be calculated for a new technology.
- Subject experts from various universities may be invited for the RAC meeting.

Prof. Janardhanan

- Efforts to be made to undertake more inter-institutional colloborative projects on molecular biology/ biotechnology/ genetics/ bioinformatics
- Scientists should come up with more number of quality publications
- The students may not be charged for doing dissertaion work at this Insitute

Dr. E. Sreenivasa Rao

- He appriciated the development of multi-viral resistant silkworm breed and newly developed mulberry variety CMY01
- Grafting method of propagation may be encouraged to avoid root rot disease in mulberry.

Mr. Y.Shankar Reddy

- He requested imparting training to the farmers on chawki rearing to produce chawki worm by themselves to overcome the issues with the quality of chawki produced from the commercial CRCs.
- Futher he requested for the quality seeds and chawki worms and remedy for non-spinning issues in the field.

Director APSSRDI / DOS Andhra Pradesh

- Establishment of seri call centres connecting all the sericultual research institutes all over India (both central and state goverment) in one plateform may be explored.

Dr. K.Jhansi Lakshmi, Sci - D, RCS

- If required, statistician from CO may be included in the research projects for statistical analysis for appropriate interpretation of the findings of the projects .

Dr. H.K. Basavaraja

- Power point presentation needs to be improved and the outcome of the research projects should be presented in bullet form.
- Silk quality aspects of the cocoons of hybrids needs to be evaluated at farmers field through purchasing of cocoons from them.
- Observations on the behavioural aspects of the newly developed hybrids should be recorded and compared at laboratory level.
- Racial characters should be verified for any newly emerging problem in the field related to the silkworms

- Suggested to maintain the mulberry leaf quality
- Number of publications by the Institute may be increased

Director, CSRTI Mysuru

- He informed that the scientists are working hard on the factors responsible for non-spinning syndrome and providing guidance to farmers.
- He insisted the PIs to submit the concluded report within the stipulated time.
- To avoid inordinate delay in procurement of non-recurring items, PIs need to take appropriate action to submit related documents for procurement of items within second quarter of initiation of new projects.

Dr. N. K.Krishna Kumar

- The chawki worms supplied from chawki rearing centres should be certified that the chawki worms are free from disease
- Every project should have conclusion on practical approach and outcome of the project
- Future projects should be formulated based on field problem

Dr. Mahadev B. Chetti

- Projects need to be taken based on the need of the farmers
- Scientists need to be encuraged to take up network projects with other Institutes through extramural grants
- Focus the research on mechanization in sericulture to reduce drudgery
- Projects may be taken for evaluating the effects of plant growth regulators for enhancing leaf productivity
- Scientists need to publish research paper in high impact factor journal
- Efforts should be made for more number of patents and commercialization
- Popularization of tree mulberry and fruit yielding mulberry varieties cultivation
- Research projects may be undertaken for development of suitable silkworm breeds and mulberry varieties to mitigate the challenges due to climate change
- Due recognition sould be given for publishing articles in Indian Silk
- The project proposals should include detailed methodology including statistical methods and experimental design to be followed

The meeting ended with vote of thanks to to the Chair, members and invitees.

CHAIRMAN
RAC, CSRTI, MYSURU

Annexure-I

List of members attended 50th meeting of RAC held on 11th & 12th September 2023

#	Name of the member
1	Dr. Mahadev B. Chetti,Vice Chancellor, Sanskriti University
2	Dr. S. Gandhi Doss Director CSRTI Mysuru, Member Convener
3	Dr. H. K. Basavaraja, Director (I/C) (Rtd.), CSB, Bengaluru - Member
4	Dr. E. Sreenivasa Rao, Principal Scientist, IIHR, Bengaluru- Member
5	Prof. (Dr.) .Janarthanan,University of Madras, Chennai- Member
6	Dr. K. Narayanagowda, UAS, GKVK, Bengaluru - Member
7	Dr. N. K. Krishna Kumar, Retd. DDG (Horti.) - Invitee
8	Dr. S. Periyaswamy Director, CSTRI Bengaluru - Invitee
9	Dr. S. M. Moorthy, Dir (Tech.) CSB, Bengaluru - Member
10	Dr. K. Jansilakshmi, Sci- D and Head, RCS, CSB, Bengaluru - Member
11	Dr. K.M. Ponnuvelu, Sci-D, NSSO, Benagaluru
12	Mr.Y. Shankar Reddy, Farmer, Palamaner, AP - Member
13	L. Chandrashakran, RJD, Representing DoS TN
14	Mr. Deveraj, AD (DOS, Mysuru), Represting DoS Karnataka - Member
15	Dr. J. Seetharamulu, Director APSSRDI, Hindupur Representing DoS AP

List of participants of institute and nested units attended 50th meeting of RAC held on 11th& 12th September 2023

#	**Name & Designation(**Inperson)	#	
1	Dr. Prashanth Sangannavar, Sci - C,RCS, CSB, Bangalore	29	Dr.S.BalasaraswathiSci-DCSRTI,Mysore
2	Dr. K.Jgannathan, Sci-D, CSTRI, Bangalore	30	Chanadrashekar M.N., Sci - D, Mysuru
3	Dr. K.B. Chandrashekar, Sci-D, CSRTI, Mysore	31	Rekha M.,DD (Stat)
4	Dr. Raghunath M.K., Sci-D, CSRTI, Mysore	32	Mr.H.M.Munikrishnappa, AD,CSRTI, Mysore
5	Dr. Mahesh R.Sci – C, CSRTI, Mysore	33	Mrs. Bhavya M.R., Sci-C, CSRTI, Mysore
6	Dr. K. N. Madhusudhan, Sci – D, CSRTI, Mysore	34	Dr. AmitKumar, Sci - D, Mysuru
7	Dr. Manjappa, Sci – C, CSRTI, Mysore	35	Dr. N.Dhahira Beevi, Sci - D, RSRS, Salem
8	Dr. Mallikarjuna G., Sci – C, CSRTI, Mysore	36	Dr.V.Lakshmanan, Sci - D, RSRS, Kodathi
9	Dr. C.M. Babu, Sci,- D, CSRTI, Mysore	37	Dr. K.P.Kirankumar, Sci - D, RSRS,Ananthapur
10	Dr. R. Bagya, Sci - D, CSRTI, Mysore	38	Dr.V.Vijay, Sci-C, SSBS, Conoor
11	Dr. Chanrdakanth, Sci - C, Mysuru	39	Dr.A.L.Jadav, Sci-C, REC, Parbhani
12	Dr. hirupathaiahY.Sci-C, CSRTI,Mysore	40	Dr. M.Venkatachalapathi, Sci-D, REC, Palamaner
13	Dr.Shivakumar,Sci-C,Mysuru	41	Mr.AzadGul, STA
14	Dr.RavindraSci-CCSRTI,Mysore	42	Raveendranath H.R, PA
15	Dr.ArunakumarG.S.Sci-CCSRTI,Mysore	43	Gowtham.K, JRF
16	Dr.TanmoySarkar.Sci-CCSRTI,Mysore	44	Jashanth.S, PA
17	Dr.DivyaSinghSci-BCSRTI,Mysore	45	Kishankumar.R, PA
18	Dr. M.MuthulakshmiSci-DCSRTIMysore	46	Prarthana.M.S,JRF
19	Dr.KusumaL.Sci-CCSRTI,Mysore	47	HarshithaR., PA
20	Dr.R.MeenalSci-DCSRTI,Mysore	48	TanviRahma, PA
21	Dr.G.S.Geetha,SRA(SS),CSRTI,Mysore	49	Rashmitha R, PA
22	Dr.S.MahibaHelenSci-DCSRTIMysore	50	Nisarga .N.R, SRF
23	Dr.Gayathri.T,Sci-CCSRTIMysore	51	Madalambika, PA
24	Dr.RanjiniM.SSci-CCSRTIMysore	52	Shashi B, PA
25	Dr.SobhanaVSci-CCSRTI,Mysore	53	Harshitha, K.M., PA
26	Dr.SatishLSci-CCSRTI,Mysore	54	ChandanaR., PA
27	Dr.Bhuvaneshwari,E.Sci-CCSRTI,Mysore	55	Shruthi.R, PA
28	Dr.DhaneswerPadhanSci-BCSRTI,Mysore		

ANNEXURE- II

Indian Sericulture Industry- Current challenges to be addressed

(A note submitted to RAC with a request to discuss in its meeting to be held on 11-12 /09/2023.)

India has shown a steady increase in its production, if not with a big jump as per the figures quoted by the Central Silk Board, the country continues to import a sizable quantity of high-grade mulberry raw silk to meet the demand of the high-speed power loom sector and has yet tofulfill its long-aspired dream of being self-sufficient in meeting the demand of high-grade (> 3A) silk besides achieving the set target by the year 2030.

If one glance at the research outcomes from the institute over the last on and a half decade, it is evident that no breakthroughs have been achieved to solve the following challenges Hence it is high time to address current challenges faced by the industry by CSRTI, Mysore-a premier mulberry research institute.

1. Silkworm eggis the first and foremost requirement for successful cocoon production to have a setback with respect to the availability of more silkworm races, production and supply of basic seed stock, especially at **andP_1** levels for the production of both bivoltine double hybrid and cress breed layings. The reasons attributed are the prevalence of heavy and continuous rains in the favorable seasons; and acute manpower shortage in P_2 farms and egg production centresin NSSO of CSB. These facts aremainly responsible for the maintenance, multiplication, and supply of basic seed stocks. Though private registered seed producers are coming forward to share the responsibility, due to some policy considerations things are not materializing. Another aspect is providing the required and trained manpower to the egg production sectors of both CSB and DOSs. This needs immediate attention, otherwise, the situation will go from bad to worst

2.Large infestation of thrips, mites, and leaf roller in mulberry gardens as a result, mulberry bio-mass is gettingbadly affected both in quantity and quality. Most of the farmers have reported the widespread infestation of thrips, mites, etc. The reasons attributed are untimely rains, spurious chemicals in the market, etc., Besides reducing the cocoon output the cost of production has also increased, thus affecting the income of the farmers. Another aspect that has surfaced recently increased incidents of non-spinning worms and loss in cocoon productivity. So far no proper diagnosis has been done nor remedy to the problem is suggested.

3. More serious problem to produce high quality silk is large-scale variation in cocoon shape, size and shell percentage as a result only 50-55 % of cocoons are reported to be fit for 3A and above grade silk production.No doubt, cocoon yields are good but the quality is not uniform which leads to loss of income to the reelers. The main reason attributed is the large-scale use of plastic mountages instead of the recommended cardboard rotary mountages. Because of the extra space requirement and additional labor, farmers are more attracted toplastic collapsible montages. To overcome the additional space requirement,Tamil Nadu type of dismountable type of rearing stands is suggested. To reduce the labour, there is an urgent need to develop self-mounting devices on rotary mountages and use of leg-operated combined mechanical harvester developed by CSR&TI, Mysuru. Further, to create awareness about the importance of cocoon quality, cocoon quality test-based pricing is imperative

4. Another important issue is climatic aberrations and untimely rains which have become more or less regular featuresdue to climatic change effects. There is an urgent need to study the subject in more detail and come out with pre-warning and forecasting approaches besides some tangiblemitigation measures

5. Since sericulture activities are labour intensive on one hand and the non-availability of the skilled workforce on the other,is affecting the regular crop schedule besides increasing the production cost. The only way left is, to develop labour-saving devices and appliances. Research institutes need to concentrate more on developing labour-saving devices/ tools and popularizing them.

6.In the southern region of our country, due to rapid urbanization and industrialization, most of the potential mulberry area has vanished. In order to compensate that and to maintain the production tempo, it is inevitable to shift the production base to new potential areas on a cluster basis and provide all the basic requirements like seed production centers, cocoon markets, and post-cocoons infrastructure.

7.Last but not least, the problem of acute shortage of trained staff in research, egg production and extension wings in all the government departments. As sericulture is a long-chain production activity involving several technical aspects need of the technical staffrequires no emphasis. If this issue is not taken seriously and sufficient posts are filled up, perhaps the progress of the industry remains as a dream.
Because of the above multiplechallenges, the industry is at a crossroads and needs to reorient itself to make the enterprise more cost-effective and attractive to all the stakeholders involved. This needs an immediate brainstorming exerciseto find the proper way for progress rather than pondering on the issues without getting into the right direction.

S.B.Dandin
10-09-2023